STERN IAG

Board of Advisors Meeting

March 13th 2019

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Letter from Portfolio Managers

Dear Board of Advisors,

The Spring semester has gotten off to an exciting start, and we have been diligently working to build off of our momentum from the previous semester. While volatile market conditions and a general air of uncertainty about the macro climate have proved challenging, we remain firm in our commitment to investing in quality businesses, and have some great new ideas to share. As always, we can't thank you enough for the supervision and input provided to us, and look forward to working together to make IAG as beneficial as possible for our members.

First off, we'd like to share that IAG has completed hiring for the 2019 Spring semester. While application count is down from last semester (as it typically is in the Spring), there was no shortage of quality candidates and we remain impressed with the level of interest and engagement shown by applicants. We hired three new analysts: Moeez Tariq, Harshit Jain and Chen Zhou, a bit smaller than our typical class, but we believe these individuals be the best fits for our culture and approach in P-team. As always, the first semester for these new hires will serve as a "trial," where we further evaluate fit and commitment to the club as they complete their training materials and learn the basics of value investing. We have great confidence that each of our new hires will complete these assessments with flying colors, and will have lots of great contributions to make to the club.

Secondly, we'd like to highlight a change to the organizational structure of P-Team. Using feedback and observations from the previous semester, as well as observations from previous years, we have decided to remove the sector system and replace it with a Senior Analyst/Junior Analyst distinction. Senior analysts work much like sector heads did, responsible for idea generation and project leadership, while junior analysts perform diligence work on pitches. We hope this shift will allow for greater freedoms in idea generation, more diverse and frequent mentorship opportunities between upper and underclassmen, and hopefully better align the organizational structure of P-team with our typical pitch process.

Over the period of the most recent quarter, the IAG fund has achieved a 0.03% return, which failed to eclipse the S&P 500 benchmark return of 0.83%. Page 10 will help offer more color as to the current drivers of performance in the portfolio. Viewing the fund's returns through this lens is key as it offers a more meaningful illustration of performance, though should be taken with appropriate context.

As was the case throughout much of 2018, market conditions have proved uncertain and challenging for us moving into 2019, from the year-end market crash and subsequent rally during the New Year to the increasingly uncertain political climate and macro threat of trade war. Given the performance of our healthcare section of our portfolio, we have been spending a lot of time educating ourselves not just on the positions but also the macro environment that is affecting these positions. As evidenced by the recent performance of many of the world's top hedge funds, quality investment ideas are few and far between, and a strong commitment to maintaining investing discipline and distinguishing genuine quality companies from value traps is more important than ever.

Letter from Portfolio Managers

The excellent businesses we search for are often long-term compounders that reflect strong capital allocation and high returns on investment; we aim to identify true economic moats indicating durable, meaningful competitive advantages. Our team also aims to identify attractive entry points while avoiding superficially-cheap, poor-quality businesses at any price.

Today, we are pleased to present five businesses that exemplify our investment philosophy. On Page 21 is United Rentals Inc (URI), the biggest equipment leaser in the country. On Page 23 is Advansix (ASIX), a Honeywell spin-off that produces Nylon-6 and other feedstock materials. On Page 25 is ZTO Express (ZTO), the biggest parcel delivery service in mainland China. On Page 30 is BorgWarner (BWA), the largest turbocharger manufacturer with a hedge against the shift to electric vehicles. On Page 34 is Aimmune Therapeutics (AIMT), a pharmaceutical company focused on the development of treatments to protect children with peanut allergies.

Best,

Nived Gopakumar & Steve Zhang

Portfolio Managers

Letter from the Chairman

Dear Board of Advisors,

We're incredibly excited to highlight some of our accomplishments from this semester. Thinking about where we were one year ago, we're tremendously proud of the structure and culture we've created. As always, this could not be done with the support and guidance we receive on your end. We're incredibly thankful to have you as mentors and more importantly people to look up to.

IAG's 1st Annual Retreat: Growing up, my dad was a huge fan of Andrew Carnegie and would always share quotes he'd come across and tape them on my wall. One of the quotes that I distinctly remember hanging on the wall of my closet was "There is little success where there is little laughter". As we continue to build IAG, it is important to spend some time and develop a sense of community. While delivering high value content to the organization is important, the friendships and memories created in the organization are arguably even more important. To create some of these positive memories, IAG recently went down to the Poconos for the weekend to spend some time developing culture. Over 75% of the organization attended, with activities ranging from hiking and soccer to cooking together in the morning.

Club partnerships

Strategic Venture Society (SVS): IAG recently engaged in a pitch-off with the SVS on the upcoming IPO of Lyft. IAG argued the short-case for Lyft, highlighting the fundamental flaws with the business model, negative characteristics of the ride-sharing industry, lack of clear pathway to profitability and threat of automation being understated. More importantly, the event served as an opportunity to help students understand the difference in investment strategies between value investing and venture capital. This marks the first event IAG has co-hosted with SVS (courtesy of IAG Creative Director and Director of Strategy Rajiv Thandla) and we are incredibly excited for future ones.

Smart Women Securities (SWS): IAG is working with SWS for their annual stock-pitch competition. IAG will provide final round contestants mentorship prior to the competition itself.

Corporate Partnerships

Buy-Side Recruiters: With the pushed up recruiting timeline for finance and consulting roles, we've seen a push from recruiters to come early to meet seniors and identify potential candidates. We are excited to bring Amity Search Partners (co-hosted with Alpha Kappa Psi and Finance Society) and Dynamic Search Partners this spring.

Apollo Private Equity Fireside Chat: Stern Office of Engagement recently reached out to IAG to host a fireside chat with a managing director from Apollo's Financial Institution Group. Jacqueline Huang (Finance Society President) and I will be moderating the fireside chat tentatively on April 25th. We're incredibly excited to have our speaker come in and share his experiences and advice.

Goldman Sachs Equity Research: Similar to our fall event, we're incredibly excited to have Goldman Sachs Equity Research come back on campus this semester. We will be hosting a question and answer panel with current equity research associates from NYU Stern.

Vanguard Event: IAG is partnering with the Office of Student Engagement to host Vanguard on April 17th. Vanguard will be coming into IAG to speak about socially responsible investing.

Letter from the Chairman Cont.

As the semester continues on, it's important to start thinking about our leadership transition. Juniors in the organization have started shadowing roles that they are interested in for next year to understand the role and day-to-day of the job. Operationally, Sruthi Boddu has now been moved from the portfolio team to the executive board, taking Steve Woo's role as treasurer. Steve Woo will now be focused more on the portfolio team

In the spirit of partnership,

Keshav Sota

President

II. Portfolio Team Overview

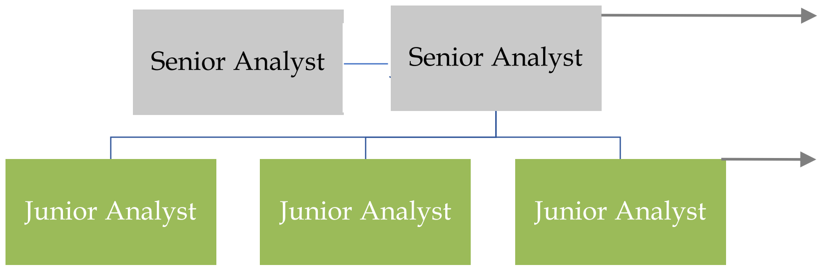
Spring 2018 Team Roster

Portfolio Manager
Nived Gopakumar
Steve Zhang

Senior Analysts
Charlie Chang
Keshav Sota
Larry Wang
Mark Sun
Mateo Panjol-Tuflija
Oliver Jiang
Sruthi Boddu
Steve Woo

Junior Analysts
Anna Utvisky
Liam Coohill
Michael Giese
Niti Parekh
Alex Hu
Brooke Fuller
Caleb Nuttle
Cody Fang
Jaro Van Diepen
Nisha Honnaya
Renjie Xu
Simran Korpal
Srikar Alluri

Team Structure and Roles



'Own' pitches by leading idea generation and facilitating pitch process.

Support Senior Analysts in modeling and material preparation.

Flaws with Prior Model

- Little need to specialize so early – people tend to self-specialize if they so choose to
- Too much hierarchy for such a small organization
- Wanted to "un-black box" the idea generation process and push it down the organization chart – anyone can have a good idea, even a junior analyst

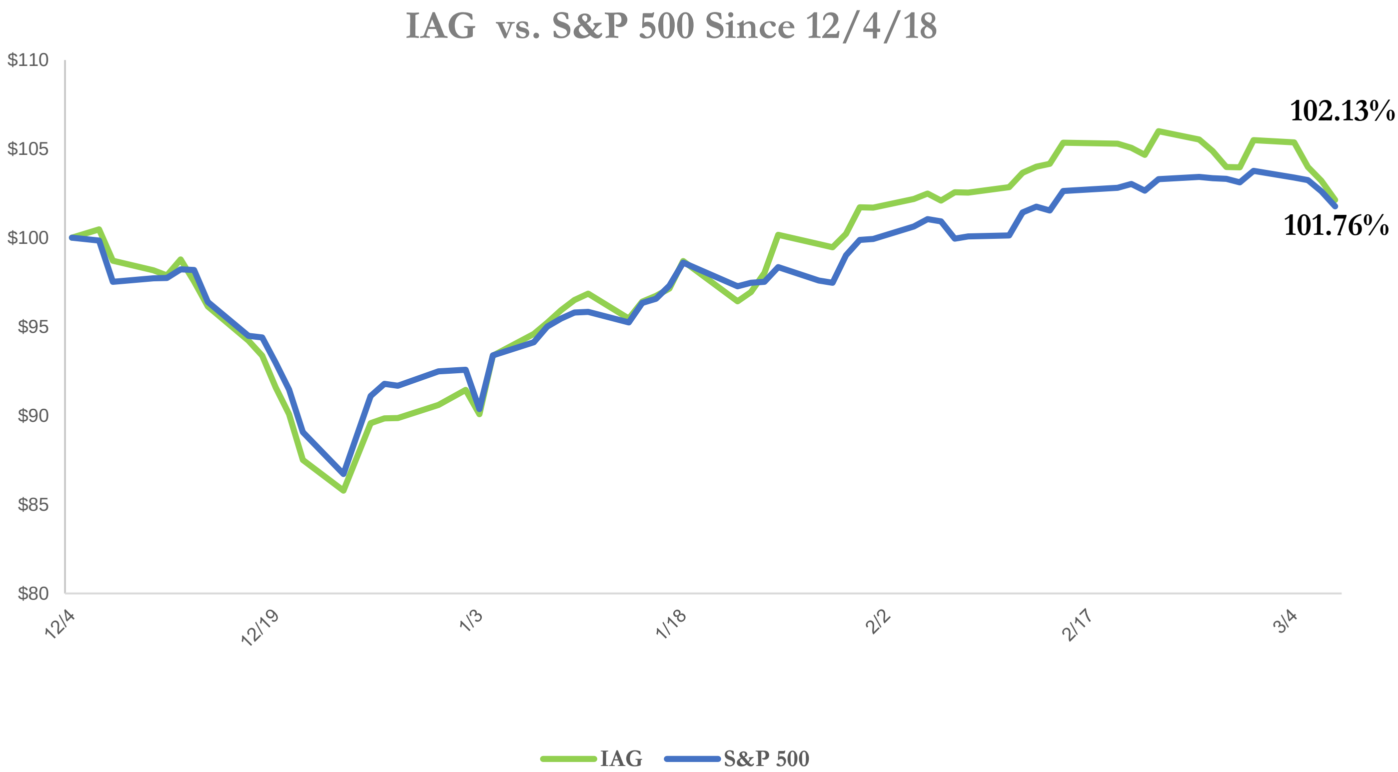
Pitch Process

1. **Idea Generation:** Work within sectors to develop ideas (outside of weekly Portfolio Team meetings)
2. **Investment Checklist:** Comprehensive list that is used to grasp with potential investment ideas
3. **Investment Memo:** Standardized memo that details key company criteria, investment thesis and possible financial and operational risks
4. **One-Pager and Valuation:** Final deliverables required for presentation to Board of Advisors

Holdings Summary *(as of February 28th 2019)*

Company	Ticker	Analyst	Purchase Date	Market Cap (M)	Share Price at Purchase	Share Price 2/28/19	% Portfolio	Current Return	Annualized Return	Morningstar Industry
Blackberry	BB	Nived Gopakumar	12/4/2018	$6,743.40	$8.18	$8.70	6.14%	5.99%	22.78%	Technology
Brixmor	BRX	Steve Woo	12/4/2018	$5,097.70	$16.00	$17.46	5.95%	8.88%	33.40%	Real Estate
Celestica	CLS	Kaan Tuncel	4/9/2018	$1,616.90	$10.06	$9.35	4.11%	-7.06%	-7.69%	Technology
Charter	CHTR	Steve Zhang	12/4/2018	$76,065.90	$321.00	$345.59	7.59%	7.66%	29.13%	Technology
Chipotle Mexican Grill	CMG	Dryden Brown	10/12/2016	$17,050.30	$430.11	$599.59	4.39%	39.40%	16.36%	Consumer Disc.
CVS Health Corp	CVS	Robert Yin	12/6/2016	$68,654.60	$77.28	$58.54	2.86%	-24.25%	-10.74%	Consumer Stap.
Dish Network	DISH	Robert Yin	12/10/2015	$14,855.30	$61.52	$31.94	1.95%	-48.08%	-14.80%	Technology
Disney	DIS	Steve Woo	11/13/2017	$169,665.30	$102.08	$112.90	5.24%	10.60%	8.03%	Consumer Disc.
DaVita	DVA	Nived Gopakumar	10/5/2018	$8,311.00	$72.15	$56.97	4.59%	-21.04%	-49.23%	Healthcare
EZCorp	EZPW	Charlie Chang	12/4/2018	$536.20	$9.00	$9.77	6.22%	8.89%	33.80%	Consumer Stap.
Gilead	GILD	Samuel Lum	11/13/2017	$80,650.50	$73.77	$68.42	4.17%	-7.26%	-5.49%	Healthcare
Green Brick Partners	GRBK	Gregory Gabovich	12/11/2017	$450.10	$11.39	$9.06	3.58%	-20.47%	-16.46%	Real Estate
IAC Interactive Corp	IAC	Sushil Bhandaru	3/2/2018	$17,413.60	$151.30	$212.99	6.24%	40.77%	39.90%	Technology
Formula One	FWONK	Kaan Tuncel	5/3/2018	$7,557.50	$29.60	$30.85	4.74%	4.22%	4.96%	Consumer Disc.
Rizzoli	RSZMF	SiHeng Yeo	5/11/2016		$0.66		0.00%	-100.00%	-35.33%	Technology
Stanley Black and Decker	SWK	Spencer Hanus	5/3/2018	$19,564.40	$139.53	$136.00	4.65%	-2.53%	-2.97%	Consumer Stap.
Western Union	WU	Robert Yin	5/6/2016	$7,815.50	$19.14	$17.85	3.49%	-6.72%	-2.36%	Financials
Western Digital Corp	WDC	Mateo Panjol-Tuflija	10/5/2018	$13,809.60	$56.45	$48.15	2.59%	-14.70%	-34.40%	Technology
SPDR S&P 500 ETF Trust	SPY						5.44%			
Cash							16.08%			
Total							**100%**			

Portfolio Performance vs Benchmark



Best and Worst Performers

Best Performing Movers (Since Last Oversight)

Company	Ticker	Share Price 12/03/18	Share Price 03/07/19	Current Return
Chipotle Mexican Grill	CMG	$468.40	$609.50	30.12%
InterActiveCorp	IAC	$177.80	$208.99	17.54%
FormulaOne	FWONK	$29.90	$33.50	12.04%

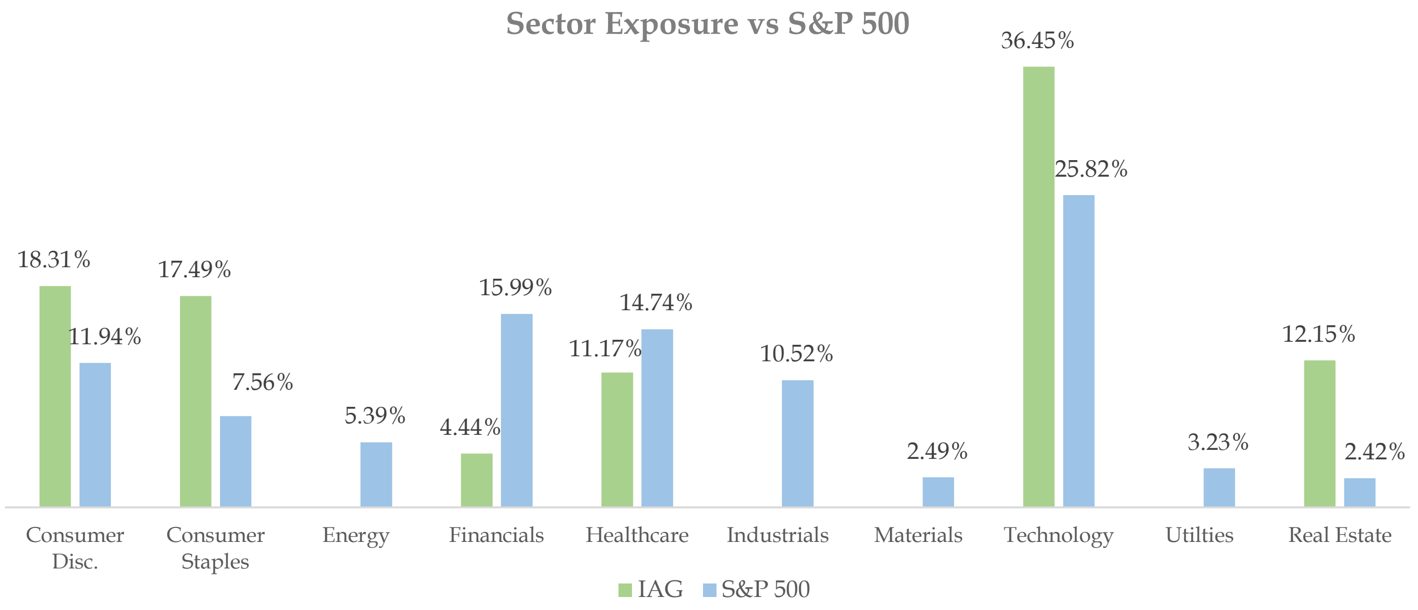
Shares of **Chipotle Mexican Grill (CMG)** soared 11.35% after exceeding Q4 expectations with comparable restaurant store sales up 6.1% and restaurant operating margins improving to 17% - up from 14.9%. The improvement in comparable restaurant store sales was driven primarily by increases in average check and comparable restaurant transactions. Additionally, digital sales grew 65.6% YoY and accounted for 12.9% of Q4 2018 sales – highlighting the success of Chipotle's strategy in digitizing customer experiences with pick-up lanes / shelves and tech-enabled second make lines. **InterActiveCorp (IAC)** shares grew 17.5% over the past couple of months due to continued user growth and the company's strong Q4 results. Match Group's average subscribers increased 17% with Tinder's average subscribers reaching 4.3 million (up 1.2 million YoY). Holding many of the strongest brands in the dating app space, including Tinder, Match, and OkCupid, IAC continues to showcase a strong growth case for future earnings potential. Lastly, **Formula One (FWONK)** shares jumped 7.94% after announcing Q4 results on February 28th. Formula One beat 2018 season audience figures across TV and digital platforms with TV viewers up 10% and aggregate race attendance up 8%.

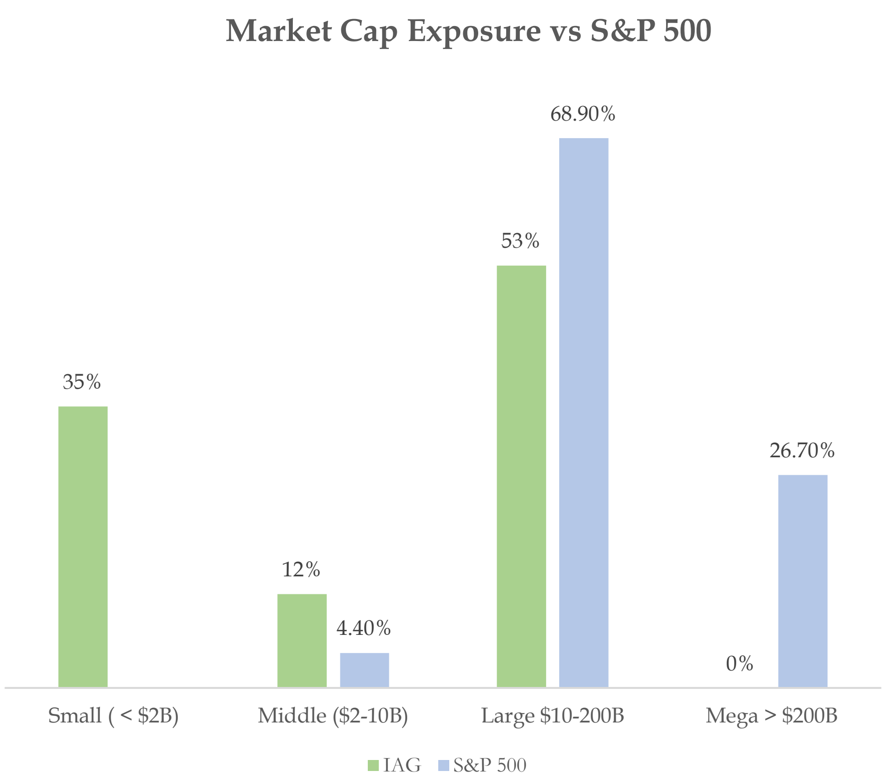
Worst Performing Movers (Since Last Oversight)

Company	Ticker	Share Price 12/03/18	Share Price 03/07/19	Period Return
CVS Health	CVA	$78.90	$52.40	-50.57%
DaVita	DVA	$64.10	$50.50	-26.93%
Gilead	GILD	$69.60	$62.50	-11.36%

CVS Health Corp (CVS) completed the $70 Billion acquisition of Aetna; however, the revenue contributed to the Company missed expectations. The company is likely to suspend capital distribution program hikes to investors. Additionally, the uncertainty of the benefit of the Aetna acquisition comes at a time in which the company's LTC business segment, established via the 2015 acquisition of Omnicare, faces material, negative headwinds such as lower occupancy rates in skilled nursing facilities, customer bankruptcies, and facility reimbursement pressures. **DaVita (DVA)** shares have fallen -21.1% since December 4th, 2018 due to consecutive Q3 and Q4 earnings misses, negative industry headwinds, and its inability to sell the primary physician business. The current administration is looking to implement cheaper kidney disease treatments, i.e. lower cost at home care and transplants, in order to reduce the >$100 billion paid by the United States government each year – jeopardizing the private dialysis clinic industry. **Gilead (GILD)** shares have taken a hit after missing Q4 earnings expectations, mixed with a decline in product sales in its HCV, HBV, Cardiovascular, Oncology, and other categories. Further pressure has been placed on the stock price as one of the company's late stage test of a chronic liver disease drugs, Selonsertib, did not produce a desired outcome.

Portfolio Exposure vs Benchmark





IAG continues to target the S&P 500 benchmark specified in the fund mandate. As of March 2019, IAG is particularly overexposed to Consumer Disc.& Technology and underexposed to Financials and Industrials. While we aim to correct IAG's overexposure, we also think our industry overexposure is cyclical and representative of where we believe there is most value in the market.

IAG is still underexposed to large- and mega-cap positions, an issue which has previously stemmed from the difficulty of identifying attractive opportunities to enter heavily covered stocks. We continue to hold positions Disney ($157 B) and Gilead ($95 B) and will continue to seek opportunities where they present themselves.

IV. Key Holdings Update

Portfolio Updates Since Dec 2018 Meeting

Company	Ticker	Update
Blackberry	BB	Since acquiring this position, Blackberry's fundamentals have materially improved due to a successful acquisition and a boost in management. The $1.4B Cylance acquisition has significantly enhanced its security capabilities by using AI to proactively detect and prevent security threats. Additionally, industry veteran Bryan Palma has been appointed COO and will oversee the ESS segment. Nevertheless, due to no erosion in the risks, we advise against doubling down on this position.
Brixmor	BRX	Thesis is still sound with disposition activity expected to slow down. BRX should be able to find new tenants for Sears/Kmart spaces based on management's expectations. This should increase rent revenue as the new rents would be higher and sooner than expected. The other components of the thesis hold up and BRX is still aggressively improving its assets. BRX also shaved off a very large portion of their lower quartile of properties and consolidated into 50 metro areas. Even further in the future, BRX is tentatively exploring mixed use developments for 2021 and beyond. Management says it wants to continue to go for the "low hanging fruit": improving properties and signing new leases at a 34% spread.
Celestica	CLS	Although Celestica missed estimates, the earnings report indicated positive notes that corroborate our investment thesis. Firstly, revenues grew 10% YoY, with the high margin ATS business demonstrating a 11% YoY return. Secondly, Celestica closed the deal to sell their headquarters on March 7 th 2019, completing one of our thesis points. Lastly, Celestica completed the acquisition of Impakt Holdings on November 12 th 2018, which is anticipated to significantly enhance Celestica's ability to provide customers with large-format, high-mix manufacturing solutions and expand Celestica's presence in key geographies.
Charter	CHTR	Charter Communications is up 13% since our December entry point as video PSU declines were better than expected. Our thesis has largely played out. Charter's FCF and Capex shows that it has largely exited its post-TWC integration phase, and now looks to harvest its investments and economies of scale. Using opex run rate and moderately declining capex, our model estimates an implied price of $386.3, or 12.8% upside to the current share price. The company is valued at $388.7 (13.5% upside) at a forward P/FCF multiple of 13.5 and $403.9 (17.9% upside) at Comcast EV/EBITDA multiples. The mobile business cash burn and fixed-line cannibalization remain our most important concern, with ARPU growth coming a close second. We will continue to monitor and update our model for the upcoming quarters.
Chipotle	CMG	**Update and Sell Note in Packet.**
CVS Health Corp	CVS	A integrated PBM-retail pharmacy model should help CVS gain more market share over time. Current M&A and organic growth strategies make CVS well-positioned to benefit from changing-market environment. On the other hand, stock price has recovered from its fall due to concern over Amazon's potential healthcare entry. While its EV/EBITDA multiple currently trades below industry average, on top of steadily increasing ROIC for 8th year straight, DCF valuation should be performed to confirm target price.
Dish Network	DISH	In keeping with the original thesis, Dish's extensive investments into diverse spectrum holdings remain its competitive edge, as the company leads in ownership of H Block, AWS-3, AWS-4 frequency bands. Approaching its March 2020 Phase One deadline, Dish has also gained traction towards its long-term NB-IoT strategy and the deployment of its 5G capable network. Since opening this position, Dish has faced significant setbacks, due to litigation, pressure from content owners, and in following suit with unfavorable MVPD and OVD industry dynamics. However, to measure Dish's trajectory towards its March 2020 goal, value appreciation in spectrum holdings, and potential growth in SlingTV business segment, we currently advise a hold recommendation using next quarter's earnings results and upcoming FCC regulations as benchmarks for further analysis.
Disney	DIS	Given our thesis based around increased streaming business as beneficial to Disney's topline growth, the company's current strategy is in line and needs time to play out in the near term. While international parks are not as strong recently, gains in domestic park are outpacing expectations.

Portfolio Updates Since Dec 2018 Meeting Cont.

Company	Ticker	Update
DaVita	DVA	DaVita was able to absorb 2 negatives (the formal announcement that the DMG deal was delayed and the lower 2019 guidance. At this valuation and heading into DMG close, it's still a good stock. It could be volatile between now and end of year when the Medicare for all noise dies down, but we have a high degree of confidence the USA will not wipe out the private insurance industry as we know it. **We would like to aggressively buy an extra 2.5%.**
EZCorp	EZPW	We recommend **purchasing additional positions in EZPW (2.5%)**. EZPW announced earning after an excellent quarter. Management executed well with US pawn segment remaining strong with positive growth and LatAm segment seeing significant expansion and growth. We believe that most of our thesis points remain intact and the market still has not fully realized the value of the firm. The stock has came down slightly after elevating significantly around earnings on new major news. Based on above reasons we are recommending purchasing additional positions and doubling down.
Gilead		Gilead Science's main segment of business of creating drugs for the treatment of HIV/AIDS has held strong with a 19% increased caused in part due to the release of their new drug, Bikvarty. With the new CEO, Daniel O'Day, finally onboarded after a period with the interim CEO, Greg Alton, the company shows promise of being able to maximize marketing in their HIV/AIDS segment to new markets increasing revenue for the segment. As of February 15th 2019, there has been a proposal to cover Kite Pharma's CAR-T Treatment. This proposal increases the potential growth of the CAR-T segment and has led to a positive outlook for investors. We will continue to monitor the decline of the HCV Segment as well as the phase III outlook for STELLAR-3.
Green Brick Partners	GNC	Greenbrick represents a quandary of a stock - the homebuilder saw 36% revenue growth in 2018 while operating income grew by 16% from 2017 when this was pitched, yet the equity has been down 15%+ since it was purchased. Even on a book value basis, it was trading between 1.0x and 1.2x, but now is trading at 0.8x. Leverage to capital ratios remains largely similar, but the multiple contraction (rather earnings expansion without price expansion) indicates the market's skepticism of the homebuilder recovery. We'd like to hold given the attractive fundamentals of the business. 0.8x reflects a non-recovery multiple and even if the homebuilding cycle were to contract, Greenbrick would see limited impact through low leverage and healthy markets
IAC Interactive Corp	IAC	InterActiveCorp is up ~77% YTD on a massive Q2 earnings beat and strong performance across segments. Most of the company's market cap can still be attributed to majority stakes in two other publicly traded companies: MTCH and ANGI. The growing video and publishing segments currently have little to no value attributed to them, which we believe is a market miscalculation. Additionally, strong growth is still expected from both Match Group and Angi Homeservices Inc., resulting in our continued bullish stance on the company.
Formula One	FWONK	Formula1 has performed in line with our investment thesis. Formula1's new sponsorships and broadcasting investments and partnerships will generate revenue and incremental EBITDA as they are implemented through the next season. With the number of unique viewers increasing from 445 last year to 490 this year, we expect Formula1 to have a higher degree of pricing power when negotiating with tracks and sponsors, leading to higher revenue and wider margins going forward.
Stanley Black and Decker	SWK	Since entering the position last March, SWK's strong management is successfully implementing its strategy through integration of acquisitions including Craftsman, Nelson, MTD, and IES and its new partnership with Home Depot. Though interest rate hikes are slowing growth in the housing and automotive sectors revenue grew by 5% organically YOY in Q4 and beat earnings 2.11 vs 2.10 expected. Management continues to targeting the goal of both growing revenue by 2022 to 22 billion and growing the margin by 50 basis points per year, presenting the complete plan for margin expansion through digital analytics in May.

Portfolio Updates Since Dec 2018 Meeting Cont.

Company	Ticker	Update
Western Union	WU	**Update and Sell Note in Packet.**
Western Digital Corp	WDC	Hold. The reported revenues and EPS for Q2 do not affect the thesis, as the thesis assumes a declining NAND revenue and a HDD revenue experiencing no growth. This revenue breakdown between the 2 segments showed an higher-than-expected revenue growth for HDD. Since Western Digital was last updated on September 30th 2018, the share price has fallen 17.27% to $48.46. The lower revenues for this quarter may cause a further drop in share price. Regardless, the thesis points in the original write-up have not significantly changed.

IV. Sell Notes

Sell Note: Chipotle Mexican Group

Dear Board of Advisors,

We would like to sell our position in Chipotle Mexican Grill, Inc., representing a 45% upside on a $425 cost basis. Since the stock was pitched in October 2016, our thesis points have mostly played out, and we decided to hold it through 2018 as well due to new developments. Chipotle's business nearly dried up after an E.coli outbreak that spanned 11 states, leading the company to undertake a chain-wide safety precaution. This had been preceded by complaints of the Norovirus and Salmonella in Chipotle's food. We anticipated that the effects of the scandal will be short-term and expected operating performance to normalize in 5-6 quarters and same store sales to grow at 3% after. Activist involvement by Pershing Square, who planned on bringing in drive-throughs, longer hours, a breakfast offering and expanding overseas, was seen in positive light. Lastly, the company planned on setting out a loyalty program called 'Chiptopia' that offered some of the best rewards in the industry, trumping those offered by most other leading loyalty programs. Analysts predicted that this would act as short-term catalysts to re-engage customers and boost same store sales.

Only 3 quarters since the stock debacle, CMG turned the corner with its new management and capitalized on its digital sales. It has opened 500 new stores since the E. coli outbreak. Brian Niccol was brought in as CEO in February 2018 and planned to take the lead in making decisions regarding their online platform, rebranding the company by reclaiming millennial attention, and investing Capex into the interior designs of its stores. CMG launched a partnership with food delivery service DoorDash that allowed customers to order burritos (and guac) on their smartphones. Their marketing campaign was effectively improving awareness and popularity of the brand, exemplified through its National Avocado Day promotion, which help set a record for CMG's highest one-day digital sales number. The analysts concluded that the stock was a hold, based on a positive sentiment that the new CEO's strategies will play out favorably in the next few quarters, and the fact that the new norms were still well below historical levels.

At this point, CMG's prospects for growth are much more limited than they were a year ago. Management believes growth can be driven through a more delivery-based model and a more strategic approach to selection of locations of restaurants, but we have reason to believe that these factors have been priced in. With all of this in mind, we see limited upside for CMG going forward. Having held the stock for almost 3 years and exceeding our original price target by more than our estimates, we believe it is time to capture our gains while we have the opportunity.

Sincerely,

Niti Parekh

Sell Note: Western Union

Dear Board of Advisors,

We would like to sell our position on **Western Union**, representing a -**5.1%** downside. We believe that our current theses are unlikely to materialize in the near and long term.

Current Earnings Recap:

Thesis Point 1: Online Revenue Growth through WU.com

We have seen online growth increase YOY over our holding period, however increased costs for the service has led to issues capitalizing on this growth keen to our thesis. With topline growth decelerating as a whole, the growth in the online segment cannot make up for other business operations segment declines. Long term, even with online growth, the business does not look positioned to preform to our expectations and to remain somewhat stagnant.

Thesis Point 2: Prospective sale of Business Solutions unit

Western Union announced in September 2018 that they were looking to sell off their Business Solutions unit. The business has historically been an underperforming asset that they were looking to recoup $500mm in value after writing down the unit for over $464mm. This announcement of listing this unit for sale has not led to any updates from management since September of last year. With the lack of any information or news on any developments, this event does not seem as likely as management hopes.

Conclusion:

Based on these points, I think it is the correct time to offload this position from our portfolio given the decline in topline and growth and the seemingly unlikely sale of Business Solutions unit, that would only give incremental upside. Our position should not hinge on an M&A event in order to see incremental upside when our capital could be put into business with stronger prospects and operations.

Best,

Michael Giese

V. New Position Proposals

STERN IAG

United Rentals Inc. (URI)

Quality business priced at bargain level multiples and trading with inaccurate comparables

Steve Woo	Caleb Nuttle	Nisha Honnaya	Simran Korpal
Senior Analyst	Junior Analyst	Junior Analyst	Junior Analyst
steve.woo@stern.nyu.edu	caleb.nuttle@stern.nyu.edu	nh1676@stern.nyu.edu	sk7478@stern.nyu.edu

Price Target: $140 - $180

March 8th 2018

Business Description:

United Rentals is a manufacturing equipment rental company with 1,197 rental locations between the US and Canada. Their primary customers are from the industrial non-construction vertical (O&G, chemical, manufacturing and food and beverage), accounting for 48% and the non-residential construction vertical (commercial, contracting and maintenance and repair) which accounts for 47%. Their largest customer accounts for 1% of revenues and the top 10% accounts for 6% of revenues. On the supplier side, the top supplier accounts for 15% of CAPEX whereas the top 10 account for 53% - both percentages have been decreasing over time.

Investment Thesis:

- **Market is unfairly punishing the company for an acquisition heavy strategy despite declining leverage and more attractive industry dynamics:** The only true moat the industry has is capital and scale that United Rentals possesses. As such, market share drives business and margins, as shown empirically. In 2010, the company possessed 8% market share, while they reported 13% in 2018 through organic growth and acquisitions. Smart capital allocation is inevitably the differentiating factor within the highly-fragmented industry, but with 35 years of rental equipment industry experience and having been CEO since 2008 when the share price was ~$10, Michael Kneeland has the track record to demonstrate smart capital allocation. However, growth by M&A inherently clashes with the cyclicality of the business (discussed in the next thesis point) and the market is punishing the equity with a lower multiple (~9.5x). In 2011, the company was 4.6x levered (Net Debt/EBITDA), while 2.8x was reported in 2018 and 2.5x is the expected number for 2019 – leverage almost halved over 8 years despite multiple acquisitions (averaging 6x EBITDA purchase price). The acquisitions are adding not just scale to the company, but also cost savings as SG&A as a % of revenue has been dropping over time. As the market leader of a fragmented and commoditized industry, consolidation is the logical strategy. As seen with the airlines industry, consolidation can lead to supply side rationalization and less susceptibility to the industry cycles.
- **URI is trading with Caterpillar, but at a lower EBITDA and P/E multiple despite possessing far superior business:** In the last 12 months, Caterpillar and United Rentals have been trading side by side (Figure 2). Caterpillar cannot exceed 15% of URI's CAPEX. Other construction OEMs and construction contractors are not trading with URI either – just CAT. Although this is likely due to both having similar profiles of investors and macro construction cycles and tariff concerns, the linkage little sense since even if CAT were to face cost pressures from the steel and aluminum tariffs, they wouldn't be able to pass it on to URI since URI has the market share and Caterpillar would face logistical issues renting equipment out by itself. On the point of multiples, CAT trades at about 10x EBITDA and 13x P/E whereas URI is trading at 6x and 10x respectively. With both multiples at a discount, the market views the equipment rental business as an inferior business to the OEM business from a growth and moat perspective. Given the consolidation efforts and considerable pricing power URI exercises, we believe the equipment rental business, with the right scale and capital discipline is the superior business.
- **Trading at recession levels:** The historical EBITDA multiple range for URI is 5x-8x with 5x downtrend/recovery level multiples – at the current 6x multiple, the downside is essentially priced in. This allows for a position on the construction industry with an asymmetrical payoff.

Key Ratios and Statistics:

Price Target	
Upside	
Share Price (3/08/19)	$123.24
Market Cap ($mm)	$9,808
EV/EBITDA	6.1x
P/E	8.8x
Average Daily Volume (mm)	1.7
52-Week Low	$94.28
52-Week High	$190.74

Operating Metrics (2018):

Time Utilization	68.6%
Equipment Volume Increase	18.8%
Increase in Rental Rate	2.2%

FY ($mm)	2018A	2019E	2020E	2021E
Revenues	$8,047	$7,930	$7,812	$7,695
EBIT	1,951	1991	1924	1857
Capex	4,551	985	1006	1023
FCFF	(1,314)	2,082	2,106	1,619

Figure 1 – Cost Synergies, EBIT Margin Expansion

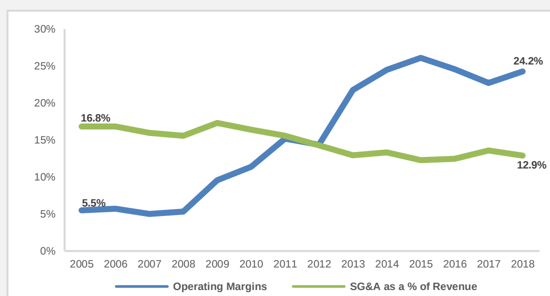
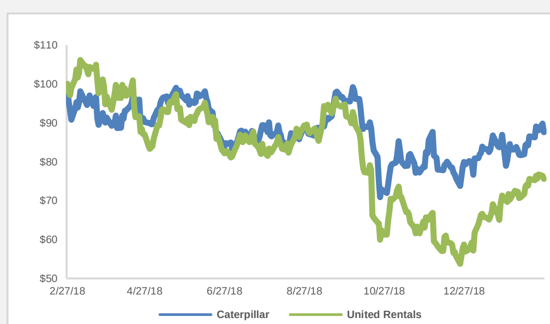


Figure 2 – Trading with the Wrong Crowd



Operating Build:

Income Statement									
FY ended 12/31									
	2015	2016	2017	2018	2019	2020	2021	2022	2023
Revenues									
Equipment rentals	$ 4,949	$ 4,941	$ 5,715	$ 6,940	$ 6,820	$ 6,719	$ 6,618	$ 6,517	$ 6,416
Other Revenue Through Sales	868	821	926	1,107	1,110	1,094	1,077	1,061	1,044
Total revenues	**5,817**	**5,762**	**6,641**	**8,047**	**7,930**	**7,812**	**7,695**	**7,578**	**7,460**
Cost of Sales									
Total cost of revenues	2,361	2,369	2,748	3,320	3,272	3,223	3,175	3,126	3,078
% of Total Revenues	41%	41%	41%	41%	41%	41%	41%	41%	41%
Depreciation of rental equipment	976	990	1,124	1,363	1,333	1,347	1,360	1,374	1,387
Total cost of revenues	**3,337**	**3,359**	**3,872**	**4,683**	**4,605**	**4,570**	**4,535**	**4,500**	**4,465**
Gross Margin	**2,480**	**2,403**	**2,769**	**3,364**	**3,325**	**3,243**	**3,160**	**3,078**	**2,995**
Operating Expenses									
Selling, general and administrative expenses	714	719	903	1,038	1,024	1,009	994	979	964
Non-rental depreciation and amortization	268	255	259	308	309	309	309	309	309
Operating Income	**1,518**	**1,415**	**1,507**	**1,951**	**1,991**	**1,924**	**1,857**	**1,790**	**1,722**

Operating Build Assumptions:

Revenue Drivers									
FY ended 12/31	2015	2016	2017	2018	2019	2020	2021	2022	2023
Increase in Rental Rate	0.5%	-2.2%	-0.2%	2.2%	-1.0%	-1.0%	-1.0%	-1.0%	-1.0%
Increase in Equipment Volume	3.2%	3.1%	18.2%	18.8%	1.0%	1.0%	1.0%	1.0%	1.0%
Time Utilization	67.3%	67.9%	69.5%	68.6%	67.6%	66.6%	65.6%	64.6%	63.6%
Fleet Size	430,000	440,000	520,000	660,000	666,600	673,266	679,999	686,799	693,667
Locations	897	887	997	1,197	1,197	1,197	1,197	1,197	1,197
Revenue Bridge					$ (117)	$ (117)	$ (117)	$ (117)	$ (117)
Revenue	**$ 5,817**	**$ 5,762**	**$ 6,641**	**$ 8,047**	**$ 7,930**	**$ 7,812**	**$ 7,695**	**$ 7,578**	**$ 7,460**

Discounted Cash Flow Valuation:

Discounted Cash Flow Analysis									
Year Ended December 31st,	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**
EBIT	$ 1,518	$ 1,415	$ 1,507	$ 1,951	$ 1,991	$ 1,924	$ 1,857	$ 1,790	$ 1,722
Tax	378	343	-298	380	498	481	464	447	431
Tax Rate	*24.9%*	*24.2%*	*-19.8%*	*19.5%*	*25.0%*	*25.0%*	*25.0%*	*25.0%*	*25.0%*
NOPAT	**1,140**	**1,072**	**1,805**	**1,571**	**1,493**	**1,443**	**1,393**	**1,342**	**1,292**
(+) D&A	1,244	1,245	1,383	1,671	1,643	1,656	1,669	1,683	1,697
(-) Capital Expenditures	1,170	847	3,684	4,551	990	1,000	1,010	1,020	1,030
(-) Change in Net Working Capital	197	(26)	(1)	5	64	(7)	(1)	2	20
Free Cash Flow to Firm	1,017	1,496	(495)	(1,314)	2,082	2,106	2,053	2,003	1,938
Discounted FCF					**1,924**	**1,798**	**1,619**	**1,460**	**1,305**

Discount Rate	
Risk Free Rate (30-Year)	3.1%
Equity Risk Premium	7.0%
Asset Beta	1.57
Cost of Equity	**14.1%**
Risk Free Rate (30-Year)	3.1%
BB Default Spread	2.4%
Cost of Debt	**5.5%**
% Debt	58.9%
% Equity	41.1%
WACC	**8.2%**
WACC Used	**10.0%**

Discount Rate

Perp.Growth	8.5%	9.0%	9.5%	10.0%	10.5%	11.0%	11.5%
0.0%	$151.4	$146.9	$142.6	$138.3	$134.2	$130.2	$126.3
0.5%	$164.1	$159.3	$154.7	$150.2	$145.8	$141.5	$137.4
1.0%	$178.5	$173.4	$168.5	$163.7	$159.0	$154.4	$150.0
1.5%	$195.1	$189.7	$184.4	**$179.2**	$174.2	$169.3	$164.5
2.0%	$214.4	$208.5	$202.8	$197.2	$191.7	$186.4	$181.3
2.5%	$237.0	$230.6	$224.4	$218.3	$212.4	$206.6	$201.0
3.0%	$264.0	$256.9	$250.1	$243.5	$237.0	$230.7	$224.6

Valuation: Terminal Growth	
Sum of Cash Flows	8,105
Terminal Growth Rate	1.5%
Terminal Value	28,767
Discounted TV	17,862
Enterprise Value	25,967
(-) Debt	11,747
(+) Cash	43
Implied EV/EBITDA	7.4x
Equity Value	**14,263**
S/O	79.6
Share Price	**$ 179.2**

Discount Rate

Exit Multiple	8.5%	9.0%	9.5%	10.0%	10.5%	11.0%	11.5%
5.5x	$111.9	$108.3	$104.8	$101.5	$98.2	$95.0	$91.9
6.0x	$126.2	$122.3	$118.5	$114.8	$111.2	$107.7	$104.3
6.5x	$140.5	$136.2	$132.1	$128.1	$124.2	$120.5	$116.8
7.0x	$154.7	$150.2	$145.8	**$141.5**	$137.3	$133.2	$129.2
7.5x	$169.0	$164.1	$159.4	$154.8	$150.3	$146.0	$141.7
8.0x	$183.3	$178.1	$173.1	$168.1	$163.4	$158.7	$154.2
8.5x	$197.6	$192.1	$186.7	$181.5	$176.4	$171.4	$166.6

Valuation: Exit Multiple	
Sum of Cash Flows	8,105
EBITDA Multiple	7.0x
Terminal Value	23,932
Discounted TV	14,860
Enterprise Value	22,965
(-) Debt	11,747
(+) Cash	43
Implied Terminal Growth	2.6%
Equity Value	**11,261**
S/O	79.6
Share Price	**$ 141.5**

AdvanSix (ASIX)

Cyclically depressed lowest cost producer with an attractive investment window

Mateo Panjol-Tuflija
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Price Target: $41.06 (32.3% upside)

March 13, 2019

Business Description:
AdvanSix Inc. is an integrated manufacturer of Nylon 6, a polymer resin which is a synthetic material used by end consumers to produce engineered plastics, fibers, filaments and films that, in turn, are used in such end-products as automotive and electrical components, carpets, sports apparel, fishing nets and food and industrial packaging. As a result of backward integration and the configuration of manufacturing facilities, AdvanSix also sells a variety of other products, all of which are produced as a part of the integrated Nylon 6 resin manufacturing process including caprolactam, ammonium sulfate fertilizers, and other chemical intermediates.

Investment Thesis:

- **Lowest cost producer of caprolactam:** Instead of producing caprolactam directly from phenol or cyclohexanone, AdvanSix produces their own phenol from cumene. In their operations, AdvanSix produces feedstock used in other processes that act as netbacks to their operation. Furthermore, AdvanSix experiences further cost reduction, both in its production and to its customers, due to its geographical position. First, the location of their manufacturing operations in the United States affords ASIX access to the world's lowest cost natural gas, which is a key raw material needed to manufacture the ammonia used in the production of caprolactam as well as the source of energy for manufacturing operations. By contrast, a significant number of competitors are located in geographic locations where energy prices are substantially higher. Secondly, US is limited when it comes to importing caprolactam. In order to ship overseas, it must be exported in flake form then melted upon arrival. This lengthens the supply chain and comes as an additional cost to customers. Due to its low marginal cost of producing, even at current spread levels, ASIX is operating at 95% utilization levels. As ASIX is operating at such high utilization levels, we can conclude that current spreads hover around the marginal cost of production. Thus, any increase in the spread would flow directly down into earnings for ASIX and create an attractive investment window where ASIX is the only economically viable competitor in the industry. The investment window lasts as long as utilization levels in China stay under the current operating levels for ASIX, after which the oversupply will push the spread down once more.

- **Smart Capital Allocation:** ASIX currently has two projects that are expected to start contributing to improved margins and EBITDA growth in 2H19. The first will replace coal fired steam supply with natural gas boilers at Hopewell to lower costs/improve yields, while the second aims to increase caprolactam production by 2% at Hopewell and improve mix at Chesterfield through improved resin yields. Management has a 20%+ IRR target on these projects. Furthermore, ASIX has repurchased $38 mm of shares in FY 2018, with management authorizing another $75 mm repurchase program.

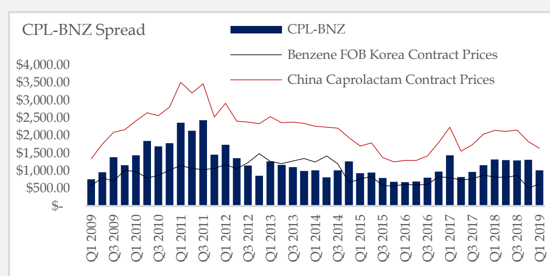
- Risk-Reward:
  Base Case ($41.06, 32.3% Upside): CPL-BNZ spreads remain stable in the US and see slight upside in the Chinese market due to supply rationalization. Levels hover around $1,400 per megaton. The ACT-PYN spread continues to see pressure and reduces to $7.5. Ammonium sulfate prices see slight upside due to nitrogen demand above supply levels.

Key Ratios and Statistics:

Price Target	$40.18
Upside	29.5%
Share Price (03/13/19)	$31.03
Market Cap	$0.93 B
52-Week Low	$22.57
52-Week High	$42.19
Cash	$20 M
Debt	$0
EV/LTM EBITDA	7.6x

Stock Performance Since IPO

CPL-BNZ Spread



- **Bull Case ($52.33, 68.7% Upside):** CPL-BNZ levels see a higher upside, averaging $1,600 per megaton. ACT-PYN levels do not see continued pressure and stay at 2018 levels. Ammonium sulfate prices follow those of the base case.
- **Bear Case ($24.07, 22% Downside):** CPL-BNZ spreads fall to $1,100 levels (comparable to 2013 levels). ACT-PYN spreads see continued pressure and settle at a historical low of $7. Ammonium Sulfate prices stay stable.

WACC Calculation	
Market Cap	$ 916.93
Total Debt	$ 200.00
Interest On Debt	5.88%
Tax Rate	21%
Cost of Debt	5.88%
Cost of Equity	13.6200%
Risk Free Rate	2.40%
Beta	2.04
Market Premium	5.50%
WACC	12.0%

Share Price Inputs	
Terminal Mutliple	7x
Cash	$20.20
Shares Oustanding	29.8
Current Share Price	$31.03

Model Summary			
S	R-sq	R-sq(adj)	R-sq(pred)
3.39781	99.90%	99.59%	19.41%

Analysis of Variance					
Source	DF	Adj SS	Adj MS	F-Value	P-Value
Regression	3	11197.4	3732.48	323.3	0.041
CPL-BNZ	1	9797.9	9797.94	848.67	0.022
ACT-PYN	1	1852.1	1852.11	160.42	0.05
Ammonium Sulfate	1	258	258.02	22.35	0.133
Error	1	11.5	11.55		
Total	4	11209			

Acetone Propylene Spread	AMS	Caprolactam Benzene Spread $ 800.00	$ 1,100.00	$ 1,400.00	$ 1,600.00
$ 7.00					
	$240.00	$ 66.68	$ 138.42	$ 210.16	$ 257.99
	$250.00	$ 70.07	$ 141.82	$ 213.56	$ 261.39
	$260.00	$ 73.47	$ 145.21	$ 216.95	$ 264.78
	$270.00	$ 76.87	$ 148.61	$ 220.35	$ 268.18
$ 8.00					
	$240.00	$ 78.52	$ 150.27	$ 222.01	$ 269.84
	$250.00	$ 81.92	$ 153.66	$ 225.41	$ 273.23
	$260.00	$ 85.32	$ 157.06	$ 228.80	$ 276.63
	$270.00	$ 88.72	$ 160.46	$ 232.20	$ 280.03
$ 10.00					
	$240.00	$ 102.22	$ 173.96	$ 245.70	$ 293.53
	$250.00	$ 105.62	$ 177.36	$ 249.10	$ 296.93
	$260.00	$ 109.01	$ 180.76	$ 252.50	$ 300.33
	$270.00	$ 112.41	$ 184.15	$ 255.90	$ 303.72
$ 12.00					
	$240.00	$ 125.92	$ 197.66	$ 269.40	$ 317.23
	$250.00	$ 129.31	$ 201.06	$ 272.80	$ 320.63
	$260.00	$ 132.71	$ 204.45	$ 276.19	$ 324.02
	$270.00	$ 136.11	$ 207.85	$ 279.59	$ 327.42

ZTO Express (Cayman) Inc. (NYSE: ZTO)

A Chinese Growth Story with Industry Leadership and Operating Excellence Amid Consolidation

Mark Sun
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Price Target: $26.24 (30.4% Upside) March 12th, 2019

Business Description:

ZTO Express provides express delivery service through its nationwide network as well as other value-added logistics and freight forwarding services. The company currently has a delivery network in China covering over 98.0% of China's cities and counties. Through core network and network partners, the company mainly provide parcels deliveries weighing under 100 pounds with an expected delivery time ranging from 8 to 72 hour. Under the "network partner" model, ZTO operates a logistics network by focusing on build-out and operations of the sorting hubs and line-haul transportation vehicles. It relies on network partners to carry out last-mile services. As at September 2018, the company has over 9,500 network partners (40% are direct network partners) operating 30,000 pickup/delivery outlets, 4,380 line-haul vehicles (80% self-operated), 83 sorting hubs.

Investment Thesis:

- **Chinese parcel delivery sector is at its inflection point. As the industry leader, ZTO is best situated to continuously capture market share, gaining bigger pricing power and pursuing further consolidations:**
  1. **Industry Landscape -** Chinese parcel delivery market is experiencing ~60% CAGR for the last decade. However, the growth is slowing to ~25% because the parcel delivery growth rate converges to the GMV growth of online shopping as online shopping generates most of the traffic in this industry. As the competition intensified, the pricing of the industry is under pressure and consolidation is active. According to various research, tier 2 operators (ranking 5th to 10th) with the volume less than 1,200M will be unable to be profitable. These operators might be acquired by an industry leader like ZTO, giving the leaders more economies of scale.
  2. **Favorable Industry Logic -** Commoditize business has long been seen as a terrible investment target. Companies offer identical service, leading to a price war that compresses the companies' margin. However, during a price war, industry and margin leader wins as they could effectively crush other companies as price-front. The network effects and huge initial investment would deter potential new entrants, giving ZTO an excellent market position to capture market share. As the industry concertation grow, the price will gradually recover (see U.S delivery price history). Therefore, we believe ZTO is a growth stock today and monopoly stock in the future.

- **ZTO has a better business model with solid operating leverage, enabling a pathway for further profitability:**
  1. **A Better Business Model -** There are two types of business model existed in Chinese express delivery – Direct (UPS) and Network. Network partners pay the parent company a network transit fee for access to its line-haul transportation and sorting networks. These network partners will receive delivery fees from customers. ZTO operate a logistics network by focusing on the build-out and operations of the core sorting hubs and line-haul transportation assets while relying on partners to carry out the last-mile deliveries. The flexibility and low-cost of the business model fit the rapid expansion of e-commerce, creating a network effect appreciation, internal flexibility, low-cost, and rapid expansion. Thanks to the economies of scale and investment into more efficient equipment and technology such as automated sorting lines and higher capacity trucks, the company enjoyed the highest operating margin against comp.
  2. **A Better Business Performance –** ZTO is continuously outsmarting the industry in term of volume growth and operating margin. Volume-wise, the company consistently beat the growth of the market by 5-10 ppt.

Key Ratios and Statistics:

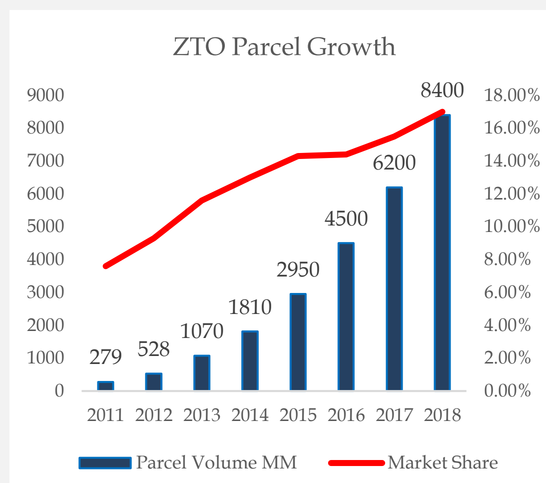
Price Target	$25.23
Upside	25.4%
Share Price (3/08/19)	$20.12
Market Cap ($mm)	$15,845
EV/EBITDA	17.9x
P/E	22.96x
Operating Cash Flow($mm)	$605.38
52-Week Low	$14.51
52-Week High	$22.67
EBITDA ($mm)	$736.4

Operating Metrics (2018):

Total Parcel Delivered	8,400M
# of Network Partners	9,500
# of Pickup/Delivery outlets	29,500

FY (¥ mm)	**2018A**	**2019E**	**2020E**	**2021E**
Revenues	$16307	$7,930	$7,812	$7,695
EBIT	4124.4	1991	1924	1857
FCFF	306.2	202.26	1021.7	1911.6

Figure 1 –Growth in Volume and Market Share



Management expects to outpace industry volume growth by 15 ppt in 2019, showing strong potential to protect/expand its market share given its fundamental and market position. Margin-wise, the company is improving line-haul transportation operations by increasing the fleets of high capacity trucks, increasing automation at sorting hub facilities, and operating leverage gains which will give them more room for a future price war and profit gain. As the company successfully consolidate key network partners by using parent company equities to align the interest and maintain a fragmented network operator base, it could capture more margin from the network operators' sides. ZTO maintained ~25% margin, vs. comp 15%.

3. **A Better Financial Position –** ZTO has an excellent financial position to further compete in the market. It has no long-term debt, and the cash flow from operation could quickly cover the vast capital expenditure of the company. Strong balance sheet and liquidity could help the company to continue to invest and increase its operating efficiency.

- **The noise over trade tensions and concerns of China economic slowdown unfairly punished ZTO's stock price:** The ongoing trade conflicts between the United States and China has been negatively impacted most of the Chinese companies' stock listed in the United States. The overall concerns of economic slowdowns also made investors question if ZTO could sustain such a high growth amid the macro slowdown. However, we argue that both factors don't affect ZTO fundamentals. ZTO is the pure domestic focus with no exposure towards oversea operation, having virtually no direct impact over trade tensions. Meanwhile, the parcel delivery industry has been outgrowing the general economy and online GMV in past decades. With increasing penetration of online shopping in the rural area and the rise of a new boutique/social+ e-commerce platform, the e-commerce GMV and parcel delivery volume would keep outpace the economy. This market noise creates a good entry opportunity for us to establish our position in this attractive company.

Figure 2 –Growth in Gross Profit with Stable Margin

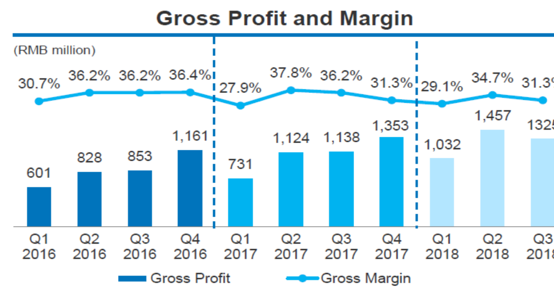
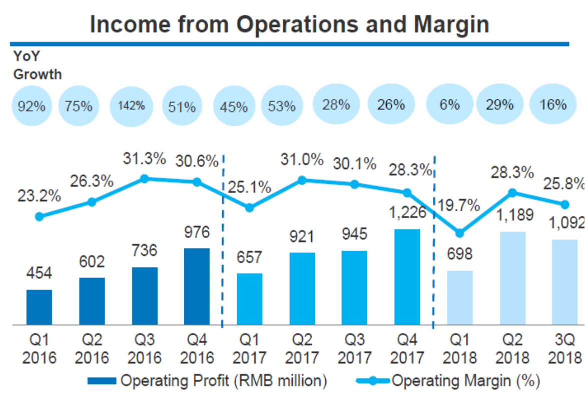


Figure 3 – EBIT Margin stabilized amid intense price war



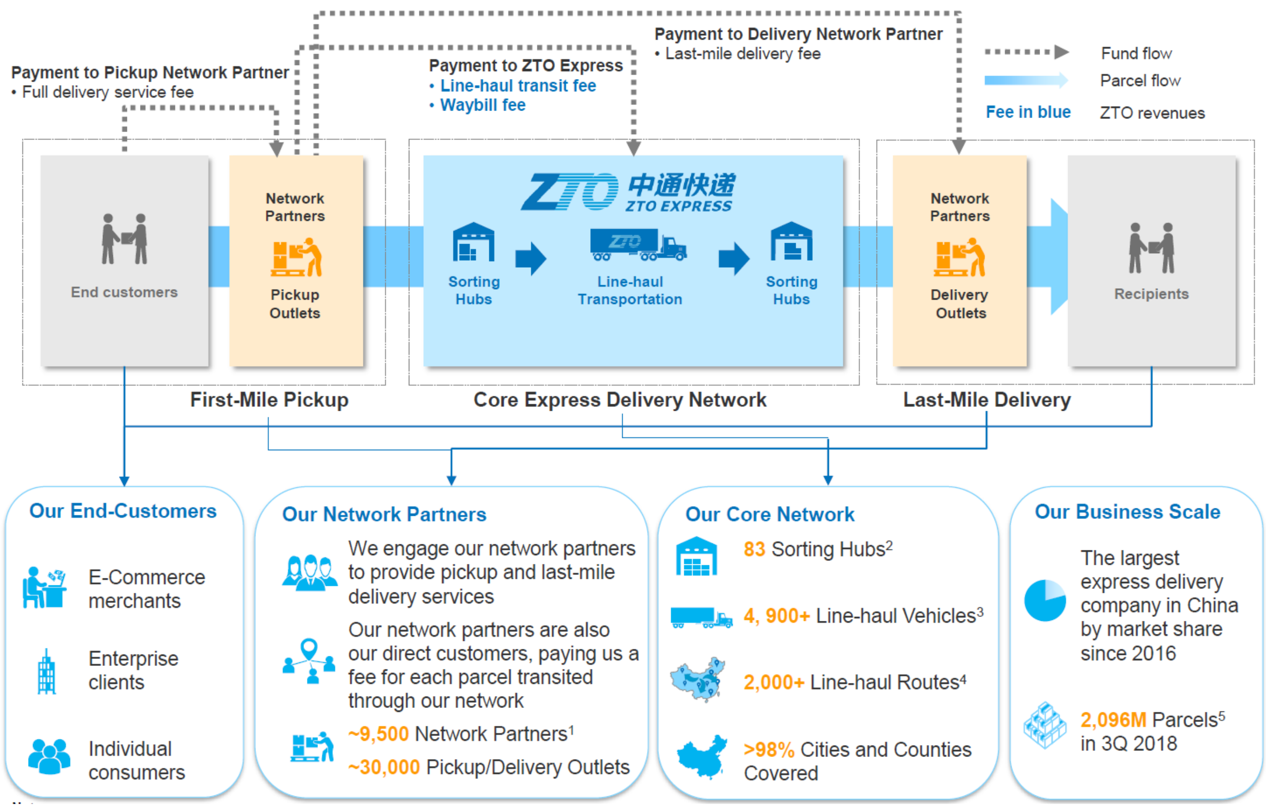
Risk-Reward:

- **Base Case ($26.24, 30.4% Upside):** Revenue growth 30% for 2019e, 26% for 2019e, 23% for 2021e; EBIT margin 24.5% p.a. over 2018-25e: In our base case, we assume that industry momentum stays solid at 25% in 2019, 22% in 2020, and 20% in 2021, gradually trending in line with GMV growth, as benefits from parcel deconsolidation and lower GMV per parcel play out. ZTO maintains its market share gain momentum, reaching 20.0% in 2020, thanks to its stronger control over line-haul resources and aligned franchisee interests. We expect margin maintained thanks to continued cost savings from a fleet upgrade and sorting automation. 3% terminal growth in this scenario.

- **Bull Case ($34.82, 73.06% Upside):** Revenue growth 35% for 2019e, 30% for 2020e, 28% for 2021e; EBIT margin 26% p.a. over 2018-20e. In our bull case, we see more upside potential led by higher long-term growth and potential synergies after the Alibaba investment. Given Ali's ambitious target to reach 1bn daily parcels (8x today's volumes), we see more sustainable long-term growth for ZTO even without considering further market share gains. Assume 4% terminal growth in this scenario.

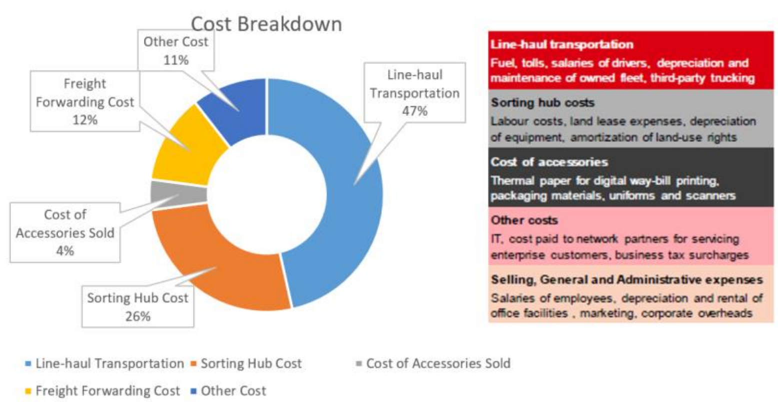
- **Bear Case ($16.10, 19.96 % Downside):** Revenue growth 23% for 2019e, 21% for 2020e, 19% for 2021e; EBIT margin 19% p.a. over 2018-20e: Our bear case incorporates slower volume growth as express parcel volume converges sharply with an e-commerce GMV slowdown. Market share gains are challenged by faster-growing, regional couriers, which benefit from increasing last-mile delivery demand, following increasing coverage of JD and Alibaba fulfillment centers. Lower adjusted EBIT margins for 2018-20e are affected by cost inflation in serving key accounts, and the potential change in social insurance policy which will lead to higher labor costs. Assume 2% terminal growth in this scenario, reflecting the risks from ZTO's loss of complete independence after Alibaba investment, a weaker bargaining power or volume loss to other key customers

Appendix 1 ZTO's Network Partner Model



Appendix 2 Company Coverage Map

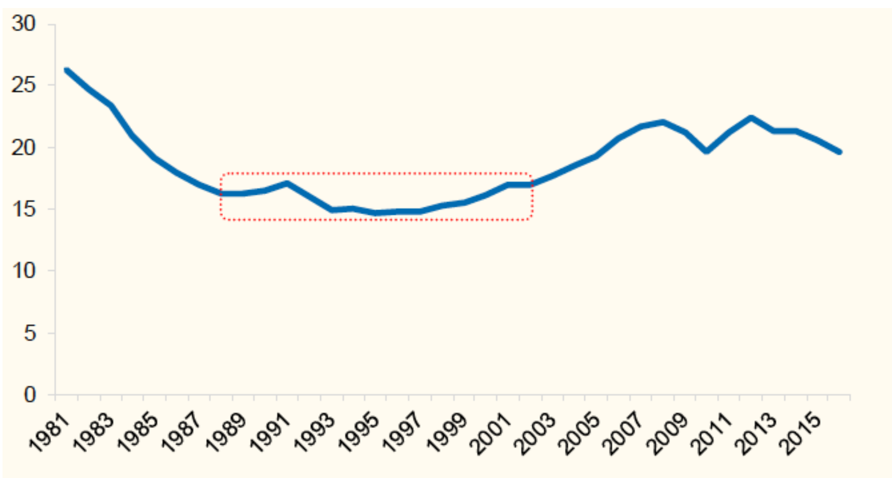
Appendix 3 Cost Breakdown



Appendix 4 China Delivery Market Breakdown

	Network partner model	Direct ownership model	In-house logistics platform
Description	▸ The headquarter (HQ) owns and operates sorting hubs and line-haul transport, while network partners control and run the pickup and delivery outlets under HQ's brand ▸ The HQ profits by charging waybill fees, line-haul transport fees and fees on sales of accessories from the network partners. ▸ The franchisees have high discretion in pricing	▸ The HQ owns and operates the entire network capacity. ▸ The HQ profits on charging delivery fees on parcel senders. ▸ Branches have no discretion on pricing	▸ Fulfilment costs are built into the product cost for direct sales by e-commerce companies or assigned to the online merchants in case of marketplace sales
Typical couriers	▸ The Tongda operators: ZTO, YTO, STO and Yunda	▸ SF Express, EMS, ZJS Express; UPS, FedEx and DHL	▸ JD.com, Suning, Dada
Strength	▸ Flexibility in network expansion ▸ Low cost with light assets ▸ Pricing advantage ▸ Suitable for non-standardised point-to-point delivery	▸ High efficiency and service quality under unified management ▸ High level of business intelligence and automation ▸ Stronger tie with clients	▸ High efficiency and service quality due to integrated e-commerce and logistics ▸ High level of business intelligence and automation ▸ Suitable for standardised products delivered from inventories at distribution centres ▸ Same-day and next-day deliveries an attractive proposition to drive online traffic
Weakness	▸ Average 2-3 day delivery time ▸ Lack of management efficiency ▸ Difficult to control quality of service ▸ Less motivated to invest in technology ▸ Weaker tie with clients (for HQ)	▸ Average 2-3 day delivery time ▸ Capital and time-consuming to scale up ▸ Low return on assets	▸ Capital and time-consuming to scale up ▸ Low return on assets

Appendix 5 US Delivery Revenue Per Unit



Appendix 7 DCF Valuation and Consideration

Base Case

DCF Base Cash (RMB in Millions)	*2018*	*2019E*	*2020E*	*2021E*	*2022E*	*2023E*	*2024E*	*2025E*	*2026E*	*2027E*	*2028E*	Terminal year
Revenue growth rate		*30.00%*	*26.00%*	*23.00%*	*21.00%*	*18.00%*	*16.00%*	*14.00%*	*12.00%*	*10.00%*	*8.00%*	*3.00%*
Revenues	¥17,604.50	¥22,885.85	¥28,836.17	¥35,468.49	¥42,916.87	¥50,641.91	¥58,744.62	¥66,968.86	¥75,005.13	¥82,505.64	¥89,106.09	¥91,779.27
EBIT Margin		*24.50%*	*24.50%*	*24.50%*	*24.50%*	*24.50%*	*24.50%*	*24.50%*	*24.50%*	*24.50%*	*24.50%*	*24.50%*
EBIT (Operating income)	4,251.91	5,607.03	7,064.86	8,689.78	10,514.63	12,407.27	14,392.43	16,407.37	18,376.26	20,213.88	21,830.99	22,485.92
Tax rate	*17.00%*	*17.00%*	*17.00%*	*25.00%*	*25.00%*	*25.00%*	*25.00%*	*25.00%*	*25.00%*	*25.00%*	*25.00%*	*25.00%*
EBIAT	3,529.09	4,653.84	5,863.84	6,517.34	7,885.98	9,305.45	10,794.32	12,305.53	13,782.19	15,160.41	16,373.24	16,864.44
Sales to capital ratio	*1.07x*	*1.25x*	*1.30x*	*1.35x*	*1.50x*	*1.50x*	*1.50x*	*1.50x*	*1.50x*	*1.50x*	*1.50x*	
Capital Reinvestment		4,225.08	4,577.17	4,912.83	4,965.59	5,150.02	5,401.80	5,482.83	5,357.51	5,000.34	4,400.30	6,587.67
Unlevered Free Cash Flow		428.76	1,286.67	1,604.51	2,920.39	4,155.43	5,392.52	6,822.70	8,424.68	10,160.07	11,972.94	10,276.77
Cost of capital		*9.50%*	*9.50%*	*9.50%*	*9.50%*	*9.50%*	*9.14%*	*8.77%*	*8.41%*	*8.04%*	*7.68%*	*7.68%*
Cumulated discount factor		0.9132	0.8340	0.7616	0.6955	0.6351	0.5820	0.5350	0.4935	0.4568	0.4242	
Present Value of Free Cash Flow		¥ 391.55	¥ 1,073.04	¥ 1,221.99	¥ 2,031.14	¥ 2,639.31	¥ 3,138.26	¥ 3,650.31	¥ 4,157.78	¥ 4,640.90	¥ 5,078.92	
ROIC	*21.99%*	*21.90%*	*22.51%*	*23.07%*	*23.60%*	*24.10%*	*23.95%*	*23.75%*	*23.49%*	*23.26%*	*22.91%*	*7.68%*
Implied variables												
Sales to capital ratio	1.07	1.25	1.30	1.35	1.50	1.50	1.50	1.50	1.50	1.50	1.50	
Invested capital	16,966.25	21,191.33	25,768.50	30,681.33	35,646.92	40,796.95	46,198.75	51,681.58	57,039.09	62,039.43	66,439.73	
ROIC	20.80%	21.96%	22.76%	21.24%	22.12%	22.81%	23.36%	23.81%	24.16%	24.44%	24.64%	7.68%

ZTO WACC and Terminal Growth Metrics

Valuation Assumption	
Valuation Date	03/12/2019
Risk Free Rate	3.18%
Adj. Beta	1.01x
Market Risk Premium	6.34%
Cost of Equity	9.57%
Cost of Debt	4.18%
Marginal Tax Rate	25.00%
Debt to Total Cap	1.05%
WACC	**9.51%**
Prepetual Growth Rate (Base Case)	3.00%

ZTO Fair Value

Fair Value	
NPV of Terminal Values	¥93,149.62
PV of FCF	28,023.20
Enterprise Value	**121,172.82**
- Debt (2018)	919.15
- Minority interests	-9.00
+ Cash	18,222.40
Value of equity	**138,485.06**
Number of shares	787.20
Estimated value /share	**175.92**
Exchanged Rate	6.72
Equity Value Per Share	**$26.18**
Current Price	$20.12
Upside	30.11%

BorgWarner Inc. (BWA)

Propulsion Agnostic Manufacturer Poised to Outgrow Industry Organically

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Price Target: $45.97

March 13th 2019

Business Description:

BorgWarner is a leading global manufacturer automotive parts for original equipment manufactures (OEMs) of light vehicles. The company is divided into two operating segments: engine and drivetrain, accounting for 62% and 38% of sales respectively. The engine segment primarily consists of turbocharger and e-booster products. The drivetrain segment consists of rotating electrical components, power electronics, and transmission technology.

Investment Thesis:

- **Combustion Business to Capitalize on Rising Demand for Fuel Economy:** BWA has experienced strong growth in its combustion engine business in recent years (currently with 25-30% market share), mostly driven by accelerated demand for its selected technologies that improve fuel economy by up to 20%. Turbocharger, having a projected growth rate of mid-to-high single digit, particularly serves as the largest product line of BWA's portfolio (~30% of sales) and second-fastest growing business segment, slightly behind its transmission business. The turbocharger market was estimated at $16.87bn in 2018 and is projected to reach $31.61bn by 2025, at a CAGR of 9.39%. As regulations are on track to reduce auto CO_2 emission grams per km by 25% to 95 in 2025, BWA expects to see its combustion product demand and CPV growth trend to continue.
- **Strengthening Position in the Hybrid Market:** Having developed a comprehensive and diversified product portfolio over the past decade, BWA is also well-positioned in 48-volt systems (hybrid architecture), capturing 15% of hybrid market share while steadily improving margins. Excluding the acquisition of Sevcon, 80% of the $2.0bn-2.4bn backlog from 2018-2020 represents hybrid (75%) and BEV (5%) components. According to management, hybrid components are projected to make up 46% of the company's propulsion systems mix by 2023. The growth is primarily driven by increasing penetration of combustion and electric vehicle products, including turbocharger. 48-volt systems technologies serve as the critical part of transition toward battery electric vehicles (BEV). With current costs of hybrid components below those of BEV, BWA will continue help OEMs to meet the increasingly stringent emission standards in the near-and-midterm, while benefiting from higher CPV than combustion propulsion architecture.
- **Future M&A Efforts to Expand Electric Vehicle Exposure:** One of the market's biggest concerns currently is the electric vehicle penetration, as an accelerated growth of the segment could eliminate the need for fuel economy and negatively affect BWA's business that depends heavily on combustion engine. BWA's 2018 revenue consists of ~99% exposure to combustion. While this clearly indicates that BWA is not yet well-positioned in the BEV market, it is still close to matching current global industry vehicle mix. Following the acquisitions of Sevcon ($193.1m) in 2017 and Remy International ($1.3bn) in 2015, both global players in electrification technologies, BWA has managed to develop four of the five critical components in a BEV by out-investing other competitors and securing tangible customers. The company is expected to make further acquisitions of the power electronic start-ups in the $200m to $300m range to meet management's 2023 guidance of 5% electric and 23% hybrid revenue mix. With current CEO Frédéric Lissalde's strong expertise in integrating purchased companies, as well as BWA's strong free cash flow generation, future M&A plans should continue to strengthen BEV foothold.

Key Ratios and Statistics:

Price Target	$45.97
Upside	19%
Share Price (3/11/19)	$38.63
Market Cap	$7.92B
Average Daily Volume	1,735,322
52-Week Low	$32.46
52-Week High	$54.35
Cash	$739.4M
Net Debt	$1.37B
P/E	8.58x
EV/EBITDA	5.3x

FY	2018A	2019E	2020E	2021E
Revenue	$10,529	$10,338	$10,908	$11,757
EBIT	1,297	1,271	1,359	1,511
EPS	$4.44	$4.25	$4.64	$5.24

Figure 1 – Stock Performance Over Past 5 Years

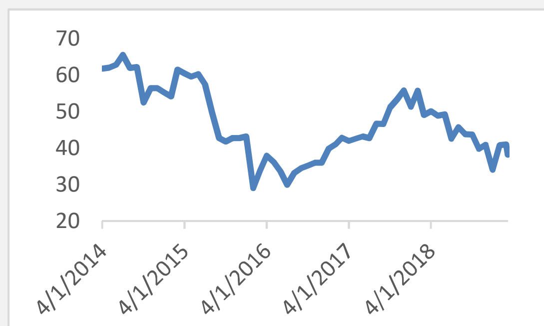
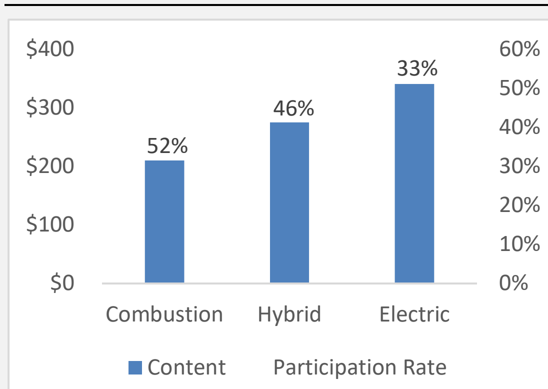


Figure 2 – Estimated Participation Rate and Average Content per Light Vehicle (2023)



Risk-Reward:

- **Base Case ($45.97, 19% Upside):** BWA's revenue achieves 7% industry outgrowth, while industry production volume is down 2%, totaling 7% in top-line growth. As a result, terminal growth rate becomes 0%.
- **Bull Case ($55.15, 43% Upside):** BWA's revenue outperforms industry by 9%, while industry production volume grows at 1%, totaling 10% in top-line growth. Terminal growth rate remains at 0%.
- **Bear Case ($30.48, 21% Downside):** BWA's revenue achieves only 3% industry outgrowth, while industry production volume is down 4%, totaling -1% in top-line growth. As a result, terminal growth rate becomes -2%.

Operating Build:

Vehicle Porduction Volume	2015A	2016A	2017A	2018A	2019E	2020E	2021E	2022E	2023E
North America (000s)	17,495	17,837	17,064	16,933	16,679	16,429	16,182	15,940	15,701
Y/Y Change	2.7%	2.0%	-4.3%	-0.8%	-1.5%	-1.5%	-1.5%	-1.5%	-1.5%
Europe (000s)	20,950	21,540	22,216	21,941	21,502	21,072	20,651	20,238	19,833
Y/Y Change	4.0%	2.8%	3.1%	-1.2%	-2.0%	-2.0%	-2.0%	-2.0%	-2.0%
China (000s)	24,023	27,369	28,013	26,955	25,607	25,095	24,593	24,101	23,619
Y/Y Change	4.5%	13.9%	2.4%	-3.8%	-5.0%	-2.0%	-2.0%	-2.0%	-2.0%
Japan/Korea (000s)	13,265	12,914	13,264	13,202	12,938	12,679	12,426	12,177	11,934
Y/Y Change	-2.9%	-2.6%	2.7%	-0.5%	-2.0%	-2.0%	-2.0%	-2.0%	-2.0%
Total	75,733	79,660	80,557	79,031	76,726	75,275	73,852	72,456	71,086
Y/Y Change	2.6%	5.2%	1.1%	-1.9%	-2.9%	-1.9%	-1.9%	-1.9%	-1.9%
Base	2								
#1 - Bull Case									
North America					0.0%	0.0%	0.0%	0.0%	0.0%
Europe					0.0%	0.0%	0.0%	0.0%	0.0%
China					0.0%	2.0%	2.0%	2.0%	2.0%
Japan/Korea					0.0%	0.0%	0.0%	0.0%	0.0%
#2 - Base Case									
North America					-1.5%	-1.5%	-1.5%	-1.5%	-1.5%
Europe					-2.0%	-2.0%	-2.0%	-2.0%	-2.0%
China					-5.0%	-2.0%	-2.0%	-2.0%	-2.0%
Japan/Korea					-2.0%	-2.0%	-2.0%	-2.0%	-2.0%
#3 - Bear Case									
North America					-3.0%	-3.0%	-3.0%	-3.0%	-3.0%
Europe					-4.0%	-4.0%	-4.0%	-4.0%	-4.0%
China					-10.0%	-6.0%	-6.0%	-6.0%	-6.0%
Japan/Korea					-4.0%	-4.0%	-4.0%	-4.0%	-4.0%

(In $ millions)

Revenue	2015A	2016A	2017A	2018A	2019E	2020E	2021E	2022E	2023E
Engine	$ 5,500.0	$ 5,590.0	$ 6,061.5	$ 6,450.0	$ 6,519.9	$ 6,787.8	$ 7,066.7	$ 7,357.1	$ 7,659.5
Y/Y Change	-3.6%	1.6%	8.4%	6.4%	1.1%	4.1%	4.1%	4.1%	4.1%
% of Total Sales	68.3%	61.3%	61.5%	61.1%	61.1%	60.6%	60.2%	59.7%	59.3%
Drivetrain	2,556.7	3,523.7	3,790.3	4,110.0	4,154.5	4,408.3	4,677.6	4,963.4	5,266.7
Y/Y Change	-2.8%	37.8%	7.6%	8.4%	1.1%	6.1%	6.1%	6.1%	6.1%
% of Total Sales	31.7%	38.7%	38.5%	38.9%	38.9%	39.4%	39.8%	40.3%	40.7%
Total Revenue	8,056.7	9,113.7	9,851.8	10,560.0	*10,674.5*	*11,196.1*	*11,744.4*	*12,320.6*	*12,926.2*
Y/Y Change	-3.3%	13.1%	8.1%	7.2%	1.1%	4.9%	4.9%	4.9%	4.9%
Industry Outgrowth	-5.9%	7.9%	7.0%	9.1%	4.0%	6.8%	6.8%	6.8%	6.8%
Inter-segment Eliminations	(33.5)	(42.5)	(52.5)	(30.4)	(45.4)	(47.7)	(50.0)	(52.5)	(55.0)
% of Revenue	-0.4%	-0.5%	-0.5%	-0.3%	-0.4%	-0.4%	-0.4%	-0.4%	-0.4%
Net Sales	$ 8,023.2	$ 9,071.2	$ 9,799.3	$ 10,529.6	$ 10,629.0	$ 11,148.5	$ 11,694.4	$ 12,268.1	$ 12,871.2
Y/Y Change	-3.4%	13.1%	8.0%	7.5%	1.1%	4.1%	4.1%	4.1%	4.1%
Engine Industry Outgrowth	-6.2%	-3.5%	7.3%	8.3%	4.0%	6.0%	6.0%	6.0%	6.0%
Base	2								
#1 - Bull Case					6.0%	8.0%	8.0%	8.0%	8.0%
#2 - Base Case					4.0%	6.0%	6.0%	6.0%	6.0%
#3 - Bear Case					2.0%	3.0%	3.0%	3.0%	3.0%
Drivetrain Industry Outgrowth	-5.4%	32.6%	6.4%	10.3%	4.0%	8.0%	8.0%	8.0%	8.0%
Base	2								
#1 - Bull Case					6.0%	10.0%	10.0%	10.0%	10.0%
#2 - Base Case					4.0%	8.0%	8.0%	8.0%	8.0%
#3 - Bear Case					2.0%	4.0%	4.0%	4.0%	4.0%

Borgwarner Inc.										
(In $ millions)	Historical Period					Projected Period				
Income Statement	**2014A**	**2015A**	**2016A**	**2017A**	**2018A**	**2019E**	**2020E**	**2021E**	**2022E**	**2023E**
Segment Sales										
Engine	$ 5,705.9	$ 5,500.0	$ 5,590.0	$ 6,061.5	$ 6,450.0	$ 6,519.9	$ 6,787.8	$ 7,066.7	$ 7,357.1	$ 7,659.5
Drivetrain	2,631.4	2,556.7	3,523.7	3,790.3	4,110.0	4,154.5	4,408.3	4,677.6	4,963.4	5,266.7
Inter-segment Elimination	(32.2)	(33.5)	(42.5)	(52.5)	(30.4)	(45.4)	(47.7)	(50.0)	(52.5)	(55.0)
Net Revenue	**8,305.1**	**8,023.2**	**9,071.2**	**9,799.3**	**10,529.6**	**10,629.0**	**11,148.5**	**11,694.4**	**12,268.1**	**12,871.2**
Adjusted Operating Income										
Engine	924.0	900.7	947.3	993.0	1,040.0	1,043.2	1,099.6	1,158.9	1,206.6	1,256.2
Drivetrain	303.3	294.6	364.3	448.6	475.0	481.9	524.6	575.4	620.4	668.9
Segment EBIT	**1,227.3**	**1,195.3**	**1,311.6**	**1,441.6**	**1,515.0**	**1,525.1**	**1,624.2**	**1,734.3**	**1,827.0**	**1,925.0**
Corporate Expense & Other	169.8	154.2	173.8	217.6	171.5	191.3	200.7	210.5	220.8	231.7
EBIT	**1,057.5**	**1,041.1**	**1,137.8**	**1,224.0**	**1,343.5**	**1,333.8**	**1,423.5**	**1,523.8**	**1,606.2**	**1,693.3**
Total D&A	**330.4**	**320.2**	**391.4**	**407.8**	**431.3**	**441.1**	**463.0**	**485.9**	**510.1**	**535.6**
Adjusted EBITDA										
Engine	1,139.3	1,100.9	1,159.2	1,211.8	1,265.7	1,277.9	1,344.0	1,413.3	1,471.4	1,531.9
Drivetrain	396.1	391.6	518.8	609.5	650.6	656.4	709.7	771.8	828.9	890.1
EBITDA	**1,398.3**	**1,362.3**	**1,511.2**	**1,629.7**	**1,728.5**	**1,774.9**	**1,886.5**	**2,009.7**	**2,116.3**	**2,228.9**
COGS	**$ 6,548.7**	**$ 6,320.1**	**$ 7,142.3**	**$ 7,683.7**	**$ 8,300.2**	**$ 8,364.3**	**$ 8,772.4**	**$ 9,199.6**	**$ 9,649.4**	**$ 10,132.0**

I/S Drivers	**2014A**	**2015A**	**2016A**	**2017A**	**2018A**	**2019E**	**2020E**	**2021E**	**2022E**	**2023E**
Segment Growth YoY										
Engine		-3.6%	1.6%	8.4%	6.4%	1.1%	4.1%	4.1%	4.1%	4.1%
Drivetrain		-2.8%	37.8%	7.6%	8.4%	1.1%	6.1%	6.1%	6.1%	6.1%
Net Revenue		-3.4%	13.1%	8.0%	7.5%	0.9%	4.9%	4.9%	4.9%	4.9%
EBITDA		-2.6%	10.9%	7.8%	6.1%	2.7%	6.3%	6.5%	5.3%	5.3%
EBIT Margin										
Engine	16.2%	16.4%	16.9%	16.4%	16.1%	16.0%	16.2%	16.4%	16.4%	16.4%
Drivetrain	11.5%	11.5%	10.3%	11.8%	11.6%	11.6%	11.9%	12.3%	12.5%	12.7%
Segment EBIT	14.8%	14.9%	14.5%	14.7%	14.4%	14.3%	14.6%	14.8%	14.9%	15.0%
EBIT	12.7%	13.0%	12.5%	12.5%	12.8%	12.5%	12.8%	13.0%	13.1%	13.2%
EBITDA Margin										
Engine	20.0%	20.0%	20.7%	20.0%	19.6%	19.6%	19.8%	20.0%	20.0%	20.0%
Drivetrain	15.1%	15.3%	14.7%	16.1%	15.8%	15.8%	16.1%	16.5%	16.7%	16.9%
EBITDA	16.8%	17.0%	16.7%	16.6%	16.4%	16.7%	16.9%	17.2%	17.3%	17.3%
Expense as a % of Sales										
Corporate Expense & Other	2.0%	1.9%	1.9%	2.2%	1.6%	1.8%	1.8%	1.8%	1.8%	1.8%
Engine D&A	3.8%	3.6%	3.8%	3.6%	3.5%	3.6%	3.6%	3.6%	3.6%	3.6%
Drivetrain D&A	3.5%	3.8%	4.4%	4.2%	4.3%	4.2%	4.2%	4.2%	4.2%	4.2%
Corporate D&A	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%
COGS	78.9%	78.8%	78.7%	78.4%	78.8%	78.7%	78.7%	78.7%	78.7%	78.7%

Working Capital & CapEx	**2014A**	**2015A**	**2016A**	**2017A**	**2018A**	**2019E**	**2020E**	**2021E**	**2022E**	**2023E**
Assets										
A/R	1,444	1,665	1,689	2,019	1,987	2,038	2,138	2,243	2,353	2,468
Inventories	506	724	641	766	781	871	913	958	1,005	1,055
Prepayments & Other Assets	130	169	137	145	250	213	223	234	245	257
Total Current Assets	**2,079**	**2,558**	**2,468**	**2,931**	**3,018**	**3,122**	**3,274**	**3,434**	**3,603**	**3,781**
Asset Drivers										
Receivable Days	63.4	75.7	68.0	75.2	68.9	70.0	70.0	70.0	70.0	70.0
Inventory Days	28.2	41.8	32.8	36.4	34.3	38.0	38.0	38.0	38.0	38.0
Prepayments & Other Assets (% of Sales)	1.6%	2.1%	1.5%	1.5%	2.4%	2.0%	2.0%	2.0%	2.0%	2.0%
Liabilities										
A/P & Accured Expenses	1,530.3	1,866.4	1,847.3	2,270.3	2,144.3	2,291.6	2,403.4	2,520.4	2,643.7	2,775.9
Income Taxes Payable	14.2	49.4	68.6	40.8	58.9	64.0	68.3	73.1	77.1	81.3
Total Current Liabilities	**1,544.5**	**1,915.8**	**1,915.9**	**2,311.1**	**2,203.2**	**2,355.6**	**2,471.7**	**2,593.6**	**2,720.8**	**2,857.2**
Liabilities Drivers										
A/P & Accured Expenses Days	85.3	107.8	94.4	107.8	94.3	100.0	100.0	100.0	100.0	100.0
Income Taxes Payable (% of EBIT)	1.3%	4.7%	6.0%	3.3%	4.4%	4.8%	4.8%	4.8%	4.8%	4.8%
Net Working Capital	534.9	641.8	552.0	619.5	815.0	766.2	802.6	840.8	882.0	923.5
Changes		106.9	(89.8)	67.5	195.5	(48.8)	36.4	38.2	41.1	41.6
Capital Expenditure	**563.0**	**577.3**	**500.6**	**560.0**	**546.6**	**584.6**	**613.2**	**643.2**	**674.7**	**707.9**
% of Sales	*6.8%*	*7.2%*	*5.5%*	*5.7%*	*5.2%*	*5.5%*	*5.5%*	*5.5%*	*5.5%*	*5.5%*

Borgwarner Inc.
(In $ millions)

Discounted Cash Flow	2019E	2020E	2021E	2022E	2023E
EBIT	**$ 1,333.8**	**$ 1,423.5**	**$ 1,523.8**	**$ 1,606.2**	**$ 1,693.3**
Less: Income Tax @ 26%	346.8	370.1	396.2	417.6	440.3
Add: D&A	441.1	463.0	485.9	510.1	535.6
Less: Change in NWC	(48.8)	36.4	38.2	41.1	41.6
Less: CapEx	584.6	613.2	643.2	674.7	707.9
Unlevered Free Cash Flow	892.3	866.8	932.1	982.8	1,039.2
Period	1	2	3	4	5
Discounted Cash Flow	**$ 820.7**	**$ 733.4**	**$ 725.4**	**$ 703.5**	**$ 684.2**

Terminal Value: Perpetual Growth	
Perpetuity Growth Rate	0.0%
Free Cash Flow (T+1)	1,039
Terminal Value	11,922
Present Value of TV	7,850
EV	11,518
TV as % of EV	68.2%
Calculation of EV	
EV	11,518
Less: Net Debt	1,855
Equity Value	9,662
Equity Value Per Share (Diluted)	**$45.97**
Implied ROI	**19.0%**

Terminal Value: Multiple Method	
Exit EV/EBITDA Multiple	5.5x
EBITDA	2,229
Terminal Value	12,259
Present Value of TV	8,072
EV	11,739
TV as % of EV	68.8%
Calculation of EV	
EV	11,739
Less: Net Debt	1,855
Equity Value	9,884
Equity Value Per Share (Diluted)	**$47.02**
Implied ROI	**21.7%**

Weighted Average Cost of Capital	
Risk Free Rate	2.63%
Beta	1.70
Equity Risk Premium	4.49%
Cost of Equity	10.26%
Cost of Debt	3.80%
Effective Tax Rate	26.00%
After-tax Cost of Debt	2.81%
Equity Financing	8,065.9
Debt Financing	2,113.3
Equity Weighting	79.24%
Debt Weighting	20.76%
WACC	**8.7%**

Shares Outstanding	
Basic Shares Oustanding	208.8
Diluted Shares Outstanding	210.2
Stock Price	$ 38.63
Market Capitalization	**$ 8,065.9**

Sensitivity Analysis (ROI)

WACC \ Perpetuity Growth Rate	**-2.0%**	**-1.0%**	**0.0%**	**1.0%**	**2.0%**
10.00%	-14.3%	-7.7%	0.3%	10.0%	22.1%
9.20%	-6.2%	1.7%	11.3%	23.2%	38.5%
8.70%	-0.4%	8.4%	**19.3%**	32.9%	50.7%
8.20%	5.9%	15.8%	28.2%	44.0%	64.9%
7.70%	12.8%	24.1%	38.3%	56.7%	81.6%

WACC \ Exit Multiple	**4.5x**	**5.0x**	**5.5x**	**6.0x**	**6.5x**
10.00%	-2.5%	6.0%	14.5%	23.1%	31.6%
9.20%	1.3%	10.1%	19.0%	27.8%	36.6%
8.70%	3.7%	12.8%	**21.8%**	30.9%	39.9%
8.20%	6.2%	15.5%	24.8%	34.0%	43.3%
7.50%	9.9%	19.4%	29.0%	38.5%	48.1%

Aimmune Therapeutics (NASDAQ: AIMT)

A Phrase-3 Allergy Immunotherapy Company with Great Risk Reward and Huge Market Potential

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Junior Analyst
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Price Target: $46.66 (100% Upside)

March 12th, 2019

Business Description:

Aimmune Therapeutics is a clinical-stage biopharmaceutical company focused on the development of treatments for peanut and other food allergies. The company's underlying platform, Characterized Oral Desensitization Immunotherapy (CODIT), is designed to desensitize patients to food allergens via characterized biologic products used in standardized titration and maintenance treatment protocols. The lead clinical candidate, AR101, oral immunotherapy for peanut allergy, is headed towards a BLA filing by end-2018, following positive Phase 3 results in February 2018.

Investment Thesis:

- **Peanut Allergy is the untapped gold mine of allergy immunotherapy market. As a welcoming alternative to current in-house therapy, AIMT has best situated to realize strong commercial prospectus:**
  1. **Strong Market Potential** - It is estimated that over 30 million people in the United States and Europe have a food allergy, with peanut allergy being the most prevalent and most commonly associated with severe outcomes and life-threatening events. Research has shown that 0.6% of the American population has life-threaten peanuts allergy. There are currently no approved medical therapies to cure food allergies or prevent their symptoms. Research suggested that the total $1B direct cost reduction in healthcare system if treatment exists. Some in-house experiential therapy has been conducted among few elite allergist clinics while most of doctors are waiting for FDA-approved methods to perform Oral Desensitization Immunotherapy to reduce the accidental exposure of the allergy sources, especially to children patients.
  2. **Positive Results –** AR101 Phase 3 data exceeds the market's expectations on efficacy and safety and provides a clinically meaningful risk/benefit profile. We believe AR101 is well positioned to capture the peanut allergy desensitization market. PALISADE results met and exceed the market's safety and efficacy expectations with peanut toleration at the exit slightly improved upon its phase 2 data. The 53% lower end of the confidence interval exceeds the FDA's minimum 15% threshold for approval, which de-risks AR101's approval process. Also, the fact that AIMT's results add headwind to its competitors such as DBVT has shown market recognition to the superiority of the results.
  3. **Clear Commercialization Pathway –** the current in-house "homebrew" peanut allergy OIT market might be as small as < $50M at $10,000 per treatment cycle. The AIMT AR101 expect to roll out its treatment cycle at $6,000 to $8,000. The market could grow to $1B with an FDA approved therapy. These existing therapies are highly under-utilized by allergists as ~75% of allergists are awaiting an FDA-approved therapy to treat patients with OIT. The insurance companies are currently covering these therapies. We expect the insurance would continue to offer similar reimbursement or AIMT could utilize existing CPT code to reimburse these treatments.

- **Success for AR101 will be a positive read-through into AIMT's broader oral OIT platform, creating more revenue stream in the future:** AIMT's first drug AR101 could be the test-case for its OIT strategies and platform. If AR101 and PALISADE eventually succeed, the investors could expect strong investments and development in broader food allergy market from two IND-Filed pipelines (AR201 – egg allergy in 2018 and AR301 – walnut allergy), giving the company

Key Ratios and Statistics:

Price Target	
Upside	
Share Price (3/08/19)	$23.33
Market Cap ($mm)	$1,458.6
Cash/Share	$4.89
Enterprise Value	$1,157
52-Week Low	$21.22
52-Week High	$36.12
Net Debt ($mm)	$303.85
Cash Reserve	$303.9

Figure 1 – AIMT Upcoming Pipeline

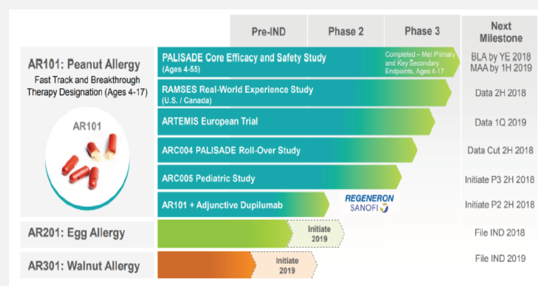


Figure 2 – CODIT Process

- Therapeutic approach referred to as "Characterize Oral Desensitization Immunotherapy" (CODIT)
  - **Initial Escalation Phase**: Done at an allergist's office
  - **Up-Dosing Phase**: Administration would be done from home, only going to allergist's office when upping the dose
  - **Ongoing Maintenance Phase**: Patients would take a daily maintenance dose to maintain desensitization; would carry epi-pens for emergencies

stronger runway to the future. If an acquisition happened after AR101 approval, these existing/ongoing pipelines could boost valuations significantly.

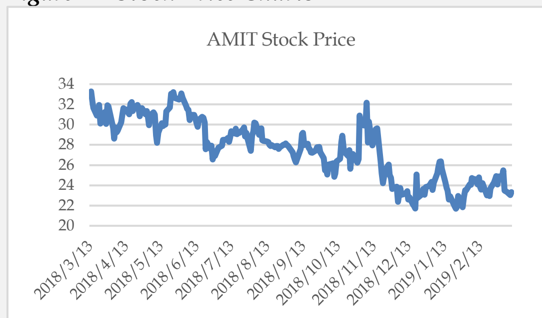
- **Strategic filed patents, strong manufacturing partnership, and shareholder base give AIMT certain downside protections, establishing a defense against similar drugs in the future:** The company has filed multiple wide-range patents that allow them to claim not only oral immunotherapy of peanut allergies but also any future oral immunotherapy involving delivering treatments via nut protein. These patents could deter the entrance of competitive drug with similar delivery methods. Also, as the active ingredient of the drug involving a specific amount of nut, the different producers would yield a significantly different clinical outcome. The established manufacturing contracts with its shareholder Golden Peanut and Tree nuts could help the company to maintain the quality of the drugs. The shareholders, including major food manufacturers such as Nestle, have a strong incentive to see the success of the company as they could reduce their investments in cross-contamination of their facilities. Such long-term focus shareholder base is rare among highly-volatile biotech companies**.**

- **The delay of approval due to governmental shutdown, coupled with liquidity concerns and commercial viabilities unfairly punished AIMT's stock price, giving a good opportunity to establish position at a Phrase-3 company with Phrase-2 valuation:** The stock of this company has been affected by noise from many unfounded threats. Due to the government shutdown, the approval process of its AR101 is delayed for 3 months, which make people concerns over companies' liquidity. However, the company just secured a loan from KKR that enable them to operate to the end of 2020. Also, due to the unclear pricing and reimbursement prospects coupled with company over-advertisement, the investors are not excited about the outlook of the company. Therefore, AIMT effective traded like a phrase-2 company with 1x EV/Terminal Revenue while most of phrase-3 traded like 2-4x EV/Terminal Revenue.

Figure 3 – Upcoming Milestone

Timing	Milestone
March	**AR101/Peanut: FDA Acceptance of BLA filing for review**
Mid:19	AR101/Peanut: Submission of MAA for EMA (EU) review
Mid:19	AR201/Egg: Initiate Phase 2
H1:19	**AR101/Peanut: ARTEMIS (ARC010) European Ph3 data release**
Q3:19*	**AR101/Peanut: Potential AdComm**
H2:19	AR301/Walnut: Submit IND
H2:19	AR301/Walnut: Initiate Phase 2
H2:19*	**AR101/Peanut: Potential U.S. approval**
Q4:19*	**AR101/Peanut: Potential U.S. launch**
2019/2020*	**AR101+dupilumab/Peanut: Estimated Phase 2 topline results**

Figure 4 – Stock Price Charts



<u>Multi-Scenario Analysis:</u>

Scenario A. The BLA is accepted, but the FDA gives no indication of expedited review due to Breakthrough status. The BLA is then reviewed through 2019 and approved around January 2020, in line with a 12-month review window typical of PDUFA-exempt filings. AIMT shares might trade flat in the short term under this scenario and jumped after the expected approval.

Scenario B. The BLA is accepted, the FDA acknowledges the Breakthrough status and formally communicates its intent to review the filing in a quicker timeframe than a 12-month window typical of PDUFA-exempt filings. In this scenario, we believe that the FDA is unlikely to commit to a specific date but may guide to a shorter and vaguely defined review window. It will lead to a potential approval within 2019. We would expect AIMT shares would return to pre-phrase-3 stage with ~25% upside, around $30 (4Q18 highs) in the short term.

Scenario C. The BLA is not accepted and will require resubmission, similarly to what we saw play out in December with the Viaskin BLA. In our view, this could be a result of the FDA's evolving definition of allergen-based therapeutics, resulting in evolving regulatory requirements around manufacturing and quality controls for. Then, the current BLA would require tweaks in parts of the file unrelated to safety and efficacy. We would expect AIMT shares to trade down below $15 in the short term under this scenario (smaller loss relative to DBVT in the same situation last December).

<u>Valuation and Risk-Reward</u>:

- TAM Valuation – 30% market penetration would yield ~$80 stock price

Appendix 1 AIMT Patents

- Patents [2]
  - '*Peanut Formulations and Uses Thereof*'; Patent #: 10086068; Status: **GRANTED**
    - Date: October 2, 2018
    - Abstract: The present application relates to compositions for oral immunotherapy of peanut allergies. Further, the present application relates to methods for the preparation of the compositions for immunotherapy, and their use in immunotherapy
    - **MAJOR CLAIM (Claim 1):**
      - A method for treating peanut allergy in a subject, comprising:
        - selecting a subject having a peanut allergy;
        - orally administering to the subject a pharmaceutical composition comprising: peanut flour comprising 0.45 mg to 550 mg peanut protein; one or more diluents in an amount of from 1% to 99% w/w of the composition; and one or more lubricants in an amount of from 0.01% to 10% w/w of the composition.
  - '*Manufacturing of Peanut Formulations for Oral Desensitization*'; Parent # 20180200361; Status: **GRANTED**
    - Date: December 1, 2015
    - Abstract: The present technology relates generally to methods of manufacture of nut flours and/or formulations, ultra-low-fat nut flours and uses for nut flour formulations. In particular, several embodiments are directed to methods of manufacturing ultra-low-fat tree nut or peanut flour formulations for oral administration in immunotherapy of subjects affected by allergies
    -

Appendix 2 AMIT Phase 3 Results

Figure 1: Positive AR101 PALISADE Phase 3 Results

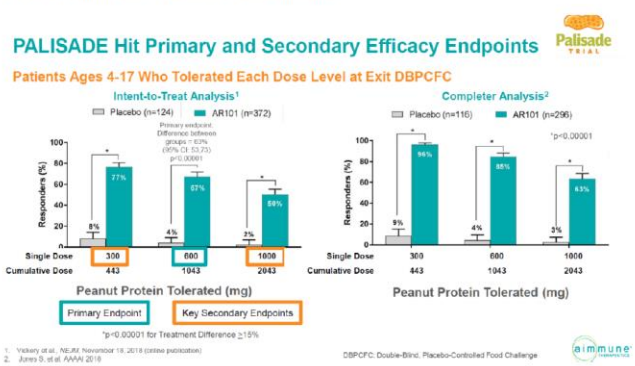
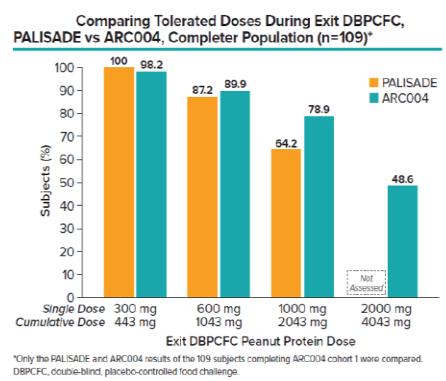


Figure 2: Comparing Tolerated Doses During Exit DBPCFC, PALISADE vs ARC004, Completer Population (Abstract #39562, AAAAI 2019)



Appendix 3 TAM Valuation

% of people buy	Total Americans	Americans with Peanut Allergies (m)	Serious Peanut Allergies (m)	Serious Peanut Allergies who buy (m)	Price per Patient	Revenues Annually (m)	Estimated Fixed Annual Costs (m)	Estimated Manufacture Costs (m)	Estimated Annual EBIT (m)	Estimated Taxes (m)	1st Year earnings (m)	Implied Share price	Implied Upside
10%	312.67	11.0738	1.9542	0.2	$ 4,800	938.02	580	536.50	-178	-37.48127275	-141.00	$ (2.88)	-112%
20%	312.67	11.0738	1.9542	0.4	$ 4,800	1,876.03	580	1073.00	223	46.84	176.20	34.10	37%
30%	312.67	11.0738	1.9542	0.6	$ 4,800	2,814.05	580	1609.49	625	131.16	493.40	**87.54**	**252%**
40%	312.67	11.0738	1.9542	0.8	$ 4,800	3,752.06	580	2145.99	1026	215.47	810.60	143.82	478%
50%	312.67	11.0738	1.9542	1.0	$ 4,800	4,690.08	580	2682.49	1428	299.79	1127.80	200.09	704%
60%	312.67	11.0738	1.9542	1.2	$ 4,800	5,628.10	580	3218.99	1829	384.11	1444.99	256.37	930%
70%	312.67	11.0738	1.9542	1.4	$ 4,800	6,566.11	580	3755.49	2231	468.43	1762.19	312.65	1156%
80%	312.67	11.0738	1.9542	1.6	$ 4,800	7,504.13	580	4291.99	2632	552.75	2079.39	368.92	1382%
90%	312.67	11.0738	1.9542	1.8	$ 4,800	8,442.14	580	4828.48	3034	637.07	2396.59	425.20	1608%
100%	312.67	11.0738	1.9542	2.0	$ 4,800	9,380.16	580	5364.98	3435	721.39	2713.79	481.48	1834%