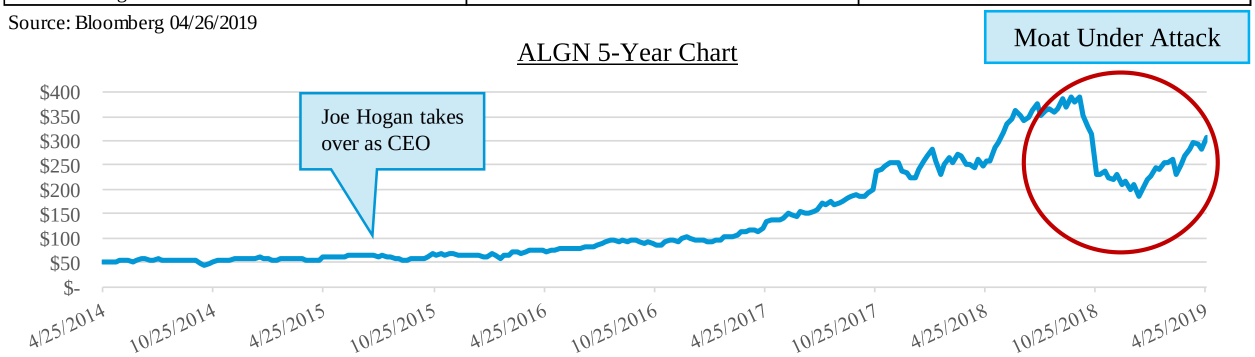
Michael Wooten, CFA
MWooten19@gsb.columbia.edu

Align Technology, Inc. (NASDAQ: ALGN) – $318

May 2, 2019

Key Trading & Operating Statistics					
Ticker:	ALGN	Market Cap:	$ 25,436.5M	ROIC (5Y Avg.):	24.9%
Sector/Industry:	Medical Devices/Software	Net Cash:	$ (617.1)	ROE (5Y Avg.):	22.9%
Recommendation:	**BUY**	Enterprise Value:	$ 24,819.4M	5Y Avg. Revenue Growth	24.4%
Share Price:	$ 318.0	2018 Revenue:	$ 1,966.5M	5Y Avg. Gross Margin:	75.3%
5Y Target Price:	**$ 632.5**	2018 EBITDA:	$ 521.3M	5Y Avg. EBIT Margin:	23.7%
Total Return Potential:	99%	Net Debt/EBITDA:	-1.2x	2019E Forward Multiples (Consensus)	
Annualized Return:	15%			P/E	58.6x
Bear/Bull:	$ 200.0 $ 1,000.0	S/O (millions):	80	EV/EBIT	44.1x
Upside/Downside:	5.7x	Short Interest %	3.8%	EV/EBITDA	39.4x
52 Week Range:	$ 398.9 $ 177.9	LTM Total Return:	23%	EV/Revenue	10.2x

Source: Bloomberg 04/26/2019



Investment Thesis - Buy

I recommend **buying** shares of Align Technologies, Inc. ("ALGN" or the "Company") due to the Company's entrenched position as the dominate market leader in the fast-growing, yet underpenetrated industry of clear aligners. While optically ALGN's valuation appears expensive at ~60x NTM P/E, I argue that the valuation is justified given the Company's durable competitive advantage and the overall attractiveness of the total addressable market ("TAM"). The recent pullback in ALGN's shares provides a compelling entry point for long-term investors to purchase a great business 20% below its 52-week high.

Anatomy of a Great Business

(Attractive Unit Economics + Large TAM) x Durable Moat = Great Business

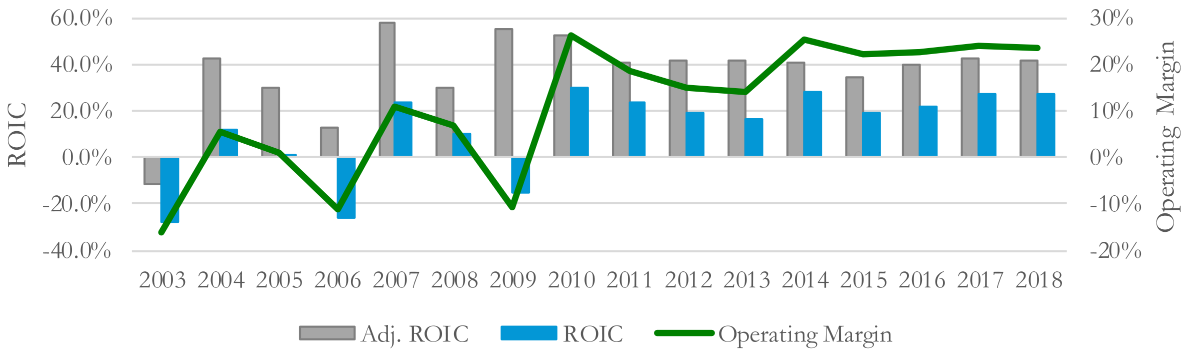
Attractive Unit Economics – ALGN has **75% gross margins** and close to 80% on Invisalign products. Since the Company reached efficient scale and a high level of automation, the operating leverage has improved operating margins well north of 20%. For every $1.00 of revenue generated, $0.20 can be reinvested into the business or returned to shareholders. Despite having a manufacturing component to its operations, ALGN is a capital light business with very attractive **ROICs of >40%** (adjusted for excess cash and Goodwill).

Large TAM – an untapped TAM provides a runway for the Company to continue reinvesting in the business at high returns on incremental invested capital (i.e. ROIC x Retention Ratio = Sustainable Growth Rate). ~**60%-75%** of the global population suffers from malocclusion (misaligned teeth) yet only 1%-2% of the affected population seeks treatment annually. ALGN is the largest provider of clear aligners, with ~70-80%+ market share, yet clear aligners only represent **15%** of orthodontic case starts. With recent product innovations, ALGN can now treat 75%-85% of cases. There are 300M people who could benefit from Invisalign in markets in which ALGN currently operates. As of 2018, approximately 12M people actively seek orthodontic treatment annually.

Durable Moat – this is the most important characteristic of a great business. A durable competitive advantage allows a company to tap the full potential of the Large TAM without losing its Attractive Unit Economics. ALGN's moat is more than a patent (or 894 patents!). It is comprised of a bunch of small things that work together in a virtuous snowball effect. When added up, these advantages will be very difficult for competitors to overcome. See below for more details on competition.

"All happy companies are different: each one earns a monopoly by solving a unique problem. All failed companies are the same: they failed to escape competition." – Peter Thiel, *Zero to One*

ALGN's Profitability Metrics Over Time



Investment Summary

ALGN is a highly innovative technology company with fully integrated end-to-end digital workflow and runs the largest 3D printing operation in the world. ALGN has two primary operating segments: 1) Its Invisalign® System (~85% of revenue), and 2) Scanners and Services ("Scanner") led by ALGN's iTero® brand (~15%). Scanners are computer-aided design & computer-aided manufacturing ("CAD/CAM") machines that dental professionals use for many treatment applications and is fully integrated with the Invisalign System. Invisalign is a Class II medical device regulated by the FDA.

The Company has enjoyed explosive growth over that last five years, compounding topline at almost 25%, largely attributable to a greater adoption by orthodontists ("Orthos") and general practitioner dentists ("GPs"), and very strong international growth, led by China, which grew 91% YoY in 2018. International represents ~50% of ALGN's revenue and China is the Company's second largest market behind the US with 8% of revenue. The adoption and interoperability of iTero and other scanners has been another significant growth driver for the Company with over 50% of cases are now submitted digitally. ALGN has found that doctors who use iTero, or other scanners that have interoperability with Invisalign, are more likely to prescribe Invisalign to patients.

In the age of smart phones and social media, increased vanity has been a global tailwind for cosmetic-oriented companies like ALGN as people become more self-conscious about their appearance. Adults who would not have considered treatment using traditional wires and brackets (d/k/a braces) are now increasingly likely to seek treatment due to the more aesthetically pleasing alternative of clear aligners, like Invisalign. ALGN estimates that there are approximately 300 million potential customers globally that could benefit from Invisalign but are hesitant to seek treatment in a doctor's office.

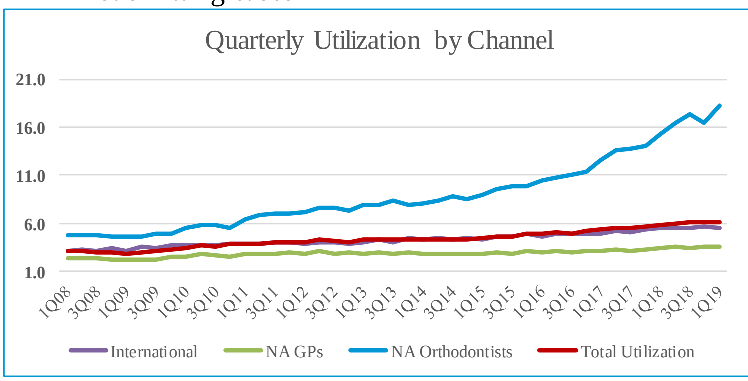
Like flies to honey, attractive businesses will attract competition and ALGN is no exception. ALGN is currently facing significant competition in the wake of the expiration of several key patents in 2017-2018. While ALGN has faced intense competition since 2005, historically these patents were an important competitive advantage because they protected ALGN's process technology, which used proprietary software to digitally automate many of the steps from treatment planning to mass manufacturing. Because competitors could not use computers to create a series of aligners (~44-50 per case), competing products had to be manufactured manually and were very limited in efficacy and efficiency. Since patents have begun expiring, there has been an onslaught of new entrants in the market.

The Bear theses on ALGN appear the same: clear aligners are a commodity and patent expirations will bring competition, eroding ALGN's market share or leading to a price war, and subsequently collapsing the Company's valuation. Full stop. **ALGN's moat is more than a patent**. Plastic might be a commodity, though ALGN uses a patented material, SmartTrack, for its aligners, so even that might be a stretch. The process for accessing the patient, creating a doctor-approved treatment plan, and then turning that plastic into a series unique, Class II medical devices in mass is anything but a commodity. The Company's competitive advantage began with its patented process technology, but now has evolved into a much more complex web of little things which creates a virtuous cycle. ALGN's patent portfolio was the dam that acted as a barrier to entry during the Company's first act while allowing the real moat to fill in behind it. Under CEO Joe Hogan's strong leadership since 2015, ALGN's focus on TAM expansion through innovation has accelerated as the Company embodies the phrase "the best defense is a great offense". ALGN's innovation separates it from the competition as Invisalign is the only clear aligner product on the market that can treat complex cases, including kids and teenagers with immature dentition (i.e. not done growing, ~70% of the market). Competitors can only treat minor cases which represent a small portion of the market.

I believe ALGN's stock is still attractive today given the strong industry tailwinds and ALGN's competitive advantages. In my Bear Case scenario (see Valuation section) of 15% 5Y EPS CAGR, **ALGN's P/E multiple would have to be cut in half (i.e. 30x) in order for this investment to lose money** over this time horizon. If ALGN's EPS compounds at 20% and the P/E multiple declines 30%, ALGN's stock will generate an 8% annualized return, which will likely outperform the S&P 500 over the next five years if we have a recession.

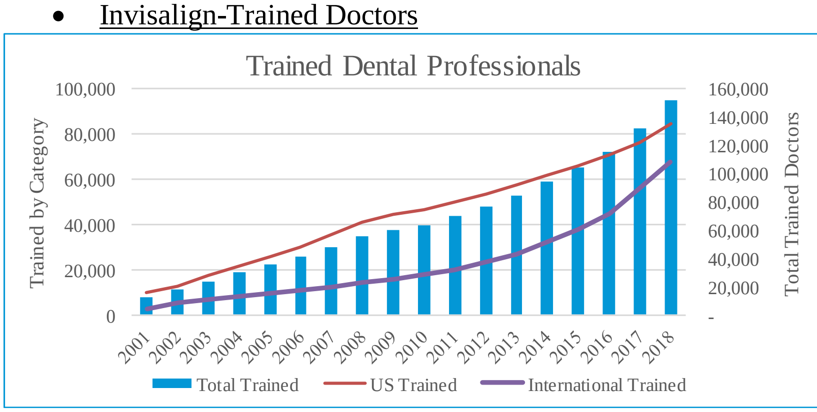
Key Value Drivers

- Quarterly Utilization – quarterly utilization is defined as # of cases submitted / # of doctors submitting cases



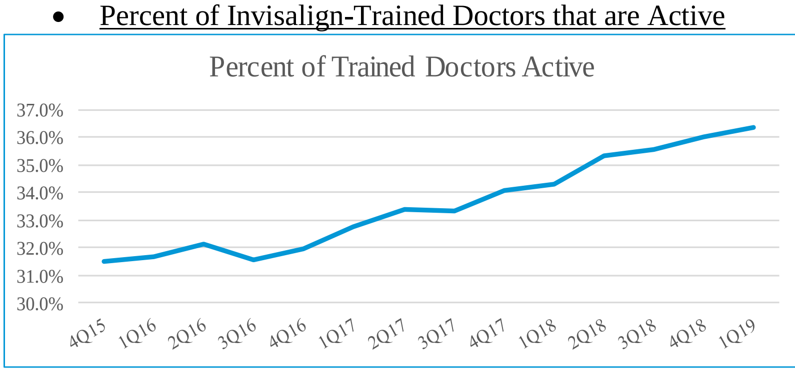
Utilization is a key metric for ALGN, especially for the Orthos because they treat more complicated cases. The utilization for ALGN's active Orthos has rapidly increased over the last few years as innovation has led to further adoption. Orthos generally treat 250-300 cases a year, so an **18.3x quarterly utilization represents 24-30% of the doctor's case volume vs. the industry average of 15%.** Utilization of GPs and Int'l doctors has steadily increased too, but is muted due to the rapid growth of new doctors trained in these respective groups. New doctors tend to treat less patients than experienced Invisalign doctors, so adding new doctors dilutes utilization ratios.

- Invisalign-Trained Doctors



ALGN spends a lot of money educating and training Orthos and GPs around the world on Invisalign. Almost all North American Orthos have been trained on Invisalign (80%+ since the early 2000s), but there are still a significant number of GPs and Int'l doctors who have not adopted Invisalign in their practices. Training Int'l doctors has been a priority for ALGN since 2015, which you can see in the J-curve to the left for the purple line. China, Europe, India, and Brazil are all key growth markets for ALGN going forward.

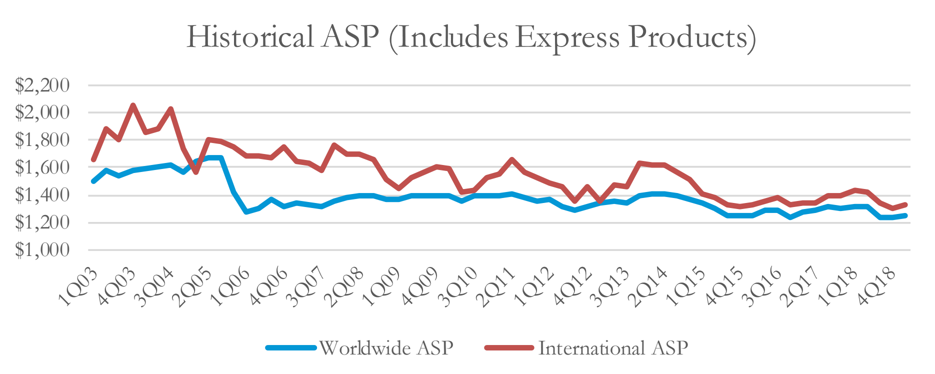
- Percent of Invisalign-Trained Doctors that are Active

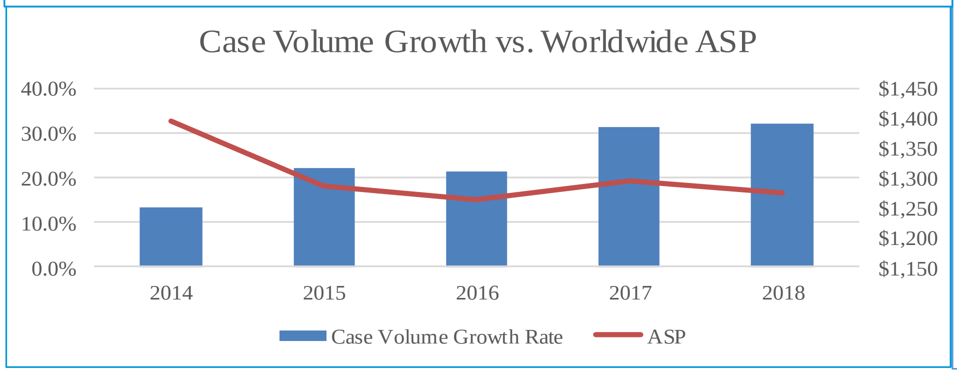


Another key metric, is the portion of trained Invisalign doctors who actively submit cases in a given quarter. Currently, only 36% of trained doctors are active in a given quarter. **The trend has been increasing steadily since the end of 2015.** So while utilization for active doctors is going up, the number of active doctors is increasing as well. This is most important for the GP channel because there are ~200,000 GPs in North America vs. ~12,000 Orthos and GPs are less likely to adopt Invisalign than Orthos.

Michael Wooten, CFA
MWooten19@gsb.columbia.edu

- <u>Case Volume growth vs. ASP on smoothed basis</u>

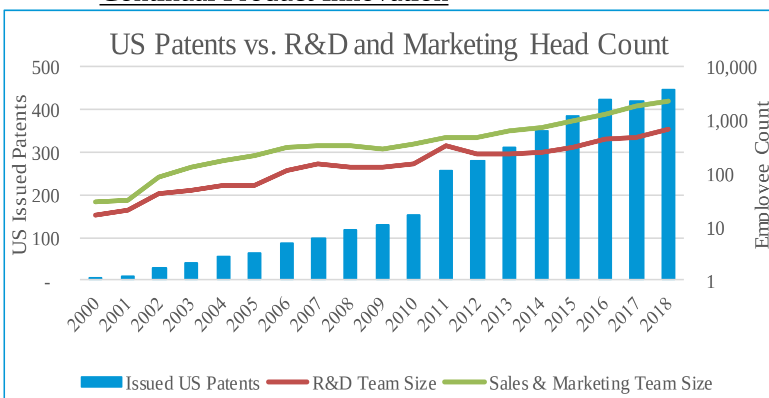




ALGN has rapidly increased case volume yet ASPs have been pretty stable on a Worldwide basis. If they can continue to hold prices stable while growing case volume, it is an indicator that ALGN has a superior product vs. new entrants. It is important to note that while ALGN has ~75% gross margins, Invisalign doctors also have significant, 70%+ gross margins as well. ASPs can fluctuate significantly QoQ due to seasonality, mix shift of products, mix shift of geographies, and periodic promotions.

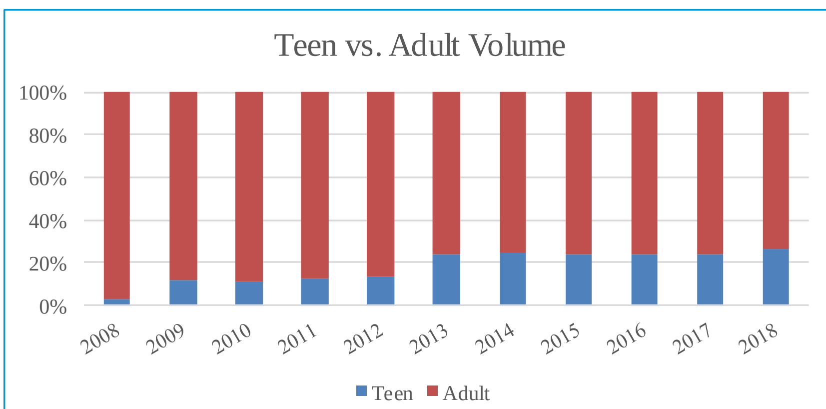
*Note, ALGN launched Invisalign Express in 2005, which accounts for the large drop in ASPs in 2005/2006

- <u>Continual Product Innovation</u>



Innovation is critical for ALGN's competitive positioning. Today they have ~450 US patents and ~870 global patents. ALGN uses machine learning and big data from its 6.8 million cases (300M+ unique aligners) to develop new software and Invisalign products so that it can continually improve treatment efficacy and efficiency. The Company launches new versions of the iTero scanner to create further stickiness with doctors. The iTero scanners are fully intergrated with ClinCheck and Invisalign, as well as other non-Invisalign workflow functionality such as restoration, and help doctors run efficient and profitable practices.

- <u>Growth in teen cases domestically & internationally</u>



ALGN is the only competitor in the clear aligner industry that can treat teen or tween patients. This is a huge advantage for ALGN because this group represents ~75% of global case starts yet only 27% of ALGN's 2018 cases came from this category. Less than 2% of Int'l case volume came from teen or tween cases. This represents a strong tailwind opportunity for ALGN as its SAM grows to reach the overall global TAM.

"All happy companies are different: each one earns a monopoly by solving a unique problem. All failed companies are the same: they failed to escape competition." – Peter Thiel, *Zero to One*

<u>Competition – Moat Under Attack</u>

<u>Key Competitors:</u>

1) <u>ClearCorrect</u>, acquired by Straumann for $150M in August 2017. ClearCorrect has been around since 2009 and is tied to another former competitor, OrthoClear, which was shut down in 2006 due to patent infringement. ClearCorrect and ALGN were in litigation for a decade but finally settled the dispute in 2019 with a small payment to ALGN and a potential partnership (with Straumann) going forward.
2) <u>Dentsply Sirona</u>: announced a new SureSmile aligner product with options including pay-per-aligner and in-office do it yourself aligner in September 2018.
3) <u>Henry Schein</u>: introduced SLX clear aligners in May 2018.
4) <u>3M Oral</u>: launched Clarity clear aligners in May 2018.
5) <u>Smile Direct Club ("SDC")</u>: ALGN lost an arbitration with SDC in March 2019 and was forced to close all twelve of its Invisalign retail locations, as well as sell its 17% stake in SDC back to the company at a below-market valuation. ALGN originally bought the stake in SDC in July 2016 as part of an agreement to supply non-Invisalign aligners to SDC as its sole third-party supplier. ALGN will not continue to be a supplier to SDC after its current supply agreement ends in 2019.

While it is clear that ALGN is facing more competition now than ever, the new product launches by 3M, Henry Schein, and Dentsply signal that the traditional braces incumbents know that clear aligners are the future of orthodontia. With clear aligners only representing 15% of the global case starts, there is still a significant runway for expansion. This is likely a situation of a rising tide will lift all boats, but the ALGN boat will benefit the most.

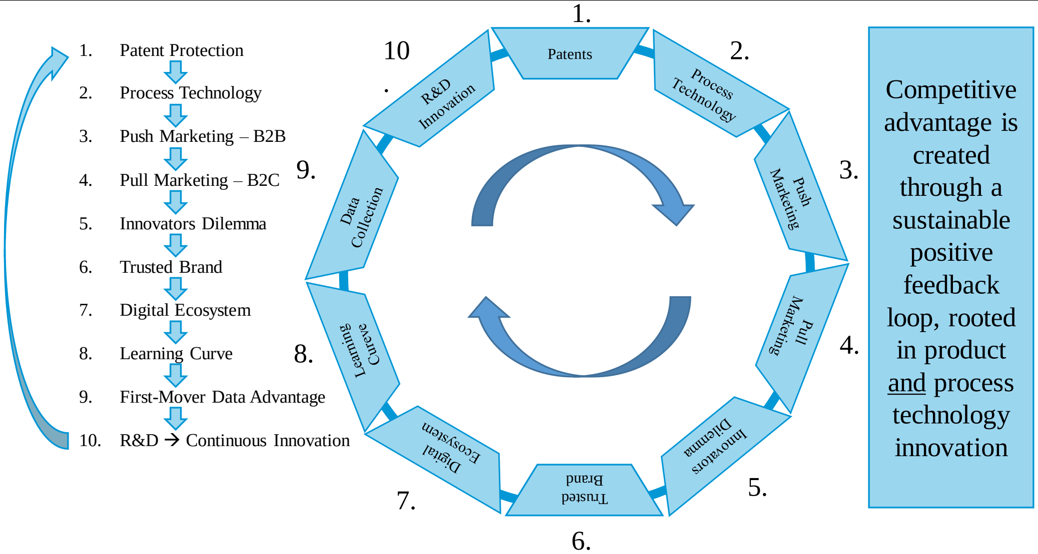
ALGN will benefit the most because they have the most comprehensive portfolio of clear aligner solutions for malocclusion, a huge data advantage, and economies of scale in their manufacturing process. Since 1999, ALGN has treated 6.8 million patients, which equates to more than 150 million unique aligners. The Company now <u>manufactures hundreds of thousands of aligners per day</u> while its competitors have only treated hundreds of thousands of patients.

For example, according to ClearCorrect's (owned by Straumann) website, the competitor has only treated "thousands of people" since 2006, while **<u>SDC has only treated "500,000 satisfied grinners"</u>**. This is important because case data collection plays a key role in creating better treatment plans and the automation process. Similar to how Google's search engine gets better over time, ALGN uses data analytics and machine learning to improve its ClinCheck and iTero software, making it smarter with the more data it has and treatments become more effective and more efficient.

"Customers won't care about any particular technology unless it **<u>solves a particular problem in a superior way</u>**. And if you can't monopolize a unique solution for a small market, you'll be stuck with vicious competition" – Peter Thiel, *Zero to One*. In short, new entrants either need to be better or be cheaper. Right now, they are fighting through the latter but comparing SDC's "60% cheaper" offering to Invisalign is apples and oranges. Competitors currently cannot treat complicated cases or most children/teenagers, which represent most of the orthodontic case starts. ALGN estimates that it only has a 10% overlap in target patients with SDC, which is the competitor that gets the most attention right now due to its heavy DTC marketing campaign. It's important to remember that SDC is an inferior product and only competes in the US. ALGN gets half of its revenue from international markets.

Since ALGN's doctor utilization rates have been increasing significantly since the launch of new products (e.g. G7 & G8, Invisalign Teen with Mandibular Advancement, and G5 for deep bite), being able to treat more complicated cases is important to doctors. The learning curve for SDC and other competitors will likely be much steeper than it was for ALGN, which took a decade to reach a million patients, but how much data will they need to come down the curve to match ALGN's technology? At what point will ALGN reach diminishing marginal utility of its proprietary data? Competing on price will only get competitors so far in this race if they cannot expand their SAM within the much larger global TAM.

Align Technology's Competitive Advantage – All the Small Things



Financial Highlights

Growth Metrics	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Case Volume	4.1%	18.3%	18.6%	17.5%	16.2%	13.2%	22.0%	21.6%	37.7%	31.2%
Revenue	2.7%	23.9%	23.9%	16.7%	17.9%	15.4%	11.0%	27.7%	36.4%	33.5%
Gross Profit	3.7%	29.9%	19.1%	15.3%	19.6%	16.1%	10.7%	27.4%	37.0%	29.6%
Operating Profit	-256.4%	-402.1%	-12.0%	-5.3%	10.1%	105.5%	-2.6%	32.0%	42.1%	31.9%
Diluted EPS (GAAP)	-138.1%	-311.1%	-12.6%	-14.5%	9.9%	126.9%	0.0%	31.6%	21.5%	73.9%
5Y Revenue CAGR	12.6%	13.3%	18.4%	14.5%	16.8%	19.5%	16.9%	17.6%	21.3%	24.4%
5Y Operating Profit CAGR	-228.3%	111.2%	-231.3%	21.7%	34.1%	-241.6%	12.9%	22.5%	32.8%	37.7%

Profitability Metrics	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Gross Margin	74.8%	78.4%	75.3%	74.3%	75.4%	75.9%	75.7%	75.5%	75.8%	73.6%
Operating Margin	-10.9%	26.5%	18.8%	15.3%	14.3%	25.4%	22.3%	23.1%	24.0%	23.7%
Net Margin (GAAP)	-10.0%	19.2%	13.9%	10.5%	9.7%	19.1%	17.0%	17.6%	15.7%	20.4%
ROIC (ex Goodwill & Excess Cash)	-22.6%	65.7%	48.6%	33.6%	28.3%	48.2%	33.3%	39.4%	45.0%	39.0%
Return on Tangible Assets	-14.9%	29.3%	22.8%	18.4%	16.7%	30.5%	20.1%	22.7%	27.3%	25.9%
ROE	-12.7%	22.8%	15.4%	10.9%	10.6%	21.0%	18.0%	20.6%	21.6%	33.3%

Balance Sheet Metrics	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
DSO	62.5	56.6	59.7	62.1	58.7	58.2	62.2	68.6	70.6	70.7
Inventory Days	9.3	10.0	18.4	31.2	32.8	29.8	31.5	32.1	30.1	30.7
DPO	126.2	235.6	238.8	240.9	216.0	208.4	225.0	210.4	201.7	186.5
Cash Flow Conversion Cycle	(54.5)	(169.0)	(160.7)	(147.7)	(124.6)	(120.4)	(131.4)	(109.7)	(100.9)	(85.0)
Net Debt (Cash)	(303.3)	(248.1)	(334.9)	(370.0)	(454.7)	(527.3)	(640.3)	(721.5)	(735.4)	(735.4)
Net Debt (Cash)/EBITDA	-2.5x	-2.2x	-3.0x	-2.6x	-2.6x	-2.5x	-3.1x	-2.6x	-1.9x	-1.4x

Cash Flow Metrics	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
CFO	74.2	129.5	130.5	133.8	186.0	226.9	238.0	247.7	438.5	554.6
CFI	(1.6)	(15.9)	(211.6)	(78.3)	(210.7)	(201.6)	(166.4)	72.8	(248.3)	6.9
CFF	6.8	14.7	27.2	10.2	(38.2)	(66.4)	(100.8)	(95.5)	(135.5)	(369.5)
Net Cash Flow	79.4	128.2	(54.0)	65.7	(63.4)	(43.1)	(32.2)	221.6	60.2	187.3
Ending Cash Balance	186.5	303.3	248.1	334.9	370.0	454.7	527.3	640.3	721.5	735.4
CFO/Net Income	-237.2%	174.4%	195.6%	227.9%	289.3%	155.6%	165.3%	130.6%	189.5%	138.6%
FCF (CFO - CAPEX)	67.0	111.5	100.2	95.4	166.6	202.8	184.5	177.1	242.8	331.3
FCF Yield	7.0%	7.9%	6.0%	4.6%	4.9%	4.5%	3.8%	2.7%	1.9%	1.9%

Management

ALGN's management team is led by CEO Joseph M. Hogan (61). Mr. Hogan has served as ALGN's President and CEO and as a member of the Board of Directors since June 2015. Prior to joining the Company, Mr. Hogan was CEO of ABB Ltd., a global power and automation technologies company based in Zurich, Switzerland from 2008 to 2013. Prior to working in ABB, Mr. Hogan was the CEO of GE Healthcare from 2000 to 2008.

Mr. Hogan has significant equity stake (required to hold 6.0x salary) in the Company. To make sure Mr. Hogan doesn't retire soon, the Board issued a very large special equity award in June 2018 in the form of Market Stock Units ("MSUs"). The MSUs cliff vest in three years based on achieving two performance measures: ALGN's absolute stock price and the stock's relative performance on total shareholder return vs. the S&P 500. The target amount of MSUs Mr. Hogan would receive in the chart below is 43,100 shares ($19M at $450 stock price) and the most he can receive is 129,300 shares, worth $64.7M at a $500 share price. <u>This is a big carrot for Mr. Hogan to reach a $500 share price by June 2021 vs. my Base Case target of $650 by 2024</u>.

		3-Year Relative Total Shareholder Return (Percentile Rank Within S&P 500)			
		<60th	60th	70th	>80th
Absolute Stock Price	$500.00	150%	200%	250%	300%
	$475.00	100%	150%	200%	250%
	$450.00	50%	100%	150%	200%
	<$450.00	0%	50%	100%	150%
	<$278.67	0%	50%	100%	100%

<u>Valuation & Margin of Safety</u>

My ~**$630 5Y price target** is based on a probability weighted average of five scenarios: **1)** Blue Sky ($3,000 PT, 2.5% weight); **2)** Bull ($1,000, 22.5%); **3)** Base ($650, 40%); **4)** Bear ($250, 20%); and **5)** Super Bear ($150, 15%). ALGN currently trades at an eye-popping 59x 2019E P/E, 39x EV/2019E EBITDA, and 10x forward EV/Sales. Stock price volatility does not bother me because I am a long-term investor with a five-year time horizon. <u>True risk is permanent loss of capital</u> when you sell.

Scenario	Price Target	Probability	Weighted
Super Bear	$ 150	15%	$ 23
Bear	$ 250	20%	$ 50
Base	$ 650	40%	$ 260
Bull	$ 1,000	23%	$ 225
Blue Sky	$ 3,000	3%	$ 75
Blended 5Y Target		100%	**$ 633**

Base Case: My Base Case assumes there will be 13.7M case starts in 5 years, with clear aligners used in 50% and ALGN serving 40% with an ASP of $1,200. The valuation equates to a 32x P/E or 7.0x EV/Revenue multiple. The return opportunity in this scenario is 104%, or an IRR of 15%.

Super Bear Case: In my Super Bear Case, the Company compounds EPS at 10% and the P/E multiple compresses below 20.0x as a result. In this scenario the Company faces extreme competition and price wars eat margins despite continued case volume growth. The loss in this scenario is ~55%.

Bear Case: In my Bear Case of 15% 5Y EPS CAGR, **ALGN's P/E multiple would have to be cut in half (i.e. 30x) in order for this investment to lose money** over 5 years. If ALGN's EPS compounds at 20% and the P/E multiple is cut by 30%, ALGN's stock will generate an 8% annualized return, likely outperforming the S&P 500. The loss in my Bear Case is 21%, or a -5% IRR.

Bull Case: My Bull Case has ALGN compounding EPS at 30% over the hold period with only mild P/E multiple compression to 54x. This scenario is similar to the Base Case in terms of case volume growth, but incorporates some pricing power and margin expansion from further economies of scale/automation to drive EPS growth.

Blue Sky Case: The Blue Sky scenario has ALGN <u>displacing Orthos & GPs</u> by using A.I. and digital automation to dominate the market. ALGN recently added Microsoft's Corporate VP of A.I. and Intelligent Cloud Business Development to its board. Eventually the DTC market will take hold, and when it does, ALGN is perfectly positioned to benefit. I estimated ALGN would have 80% of clear aligner market share and ~70% of total orthodontic case starts, while also increasing ASP by eating some of the doctors' 75%+ margin. The $3,000 PT represents a 7.5x EV/Revenue multiple and 25x P/E multiple. This scenario represents a ~840% return or 57% IRR over a 5-year hold period.

My **margin of safety** is rooted in: **A)** my belief that ALGN's durable competitive advantage is intact despite patent expirations; **B)** the size and underpenetrated nature of the TAM despite increasing levels of industry adoption, and **C)** the fact that ALGN has historically compounded revenue in excess of 13% in every 5Y period despite periods that include the Great Recession, intense competition (e.g. 2006), and initial technology that could only service a small fraction (25-35%) of the overall TAM. ALGN is a much stronger business today than it ever has been.

Risks & Mitigants

1. Competition successfully erodes ALGN's moat and a full-blown pricing war leads to margin erosion
    - ✓ **Competition must create products that are similar in scope as ALGN while making them cheaper (spending more on marketing to steal customers)**
    - ✓ **SDC only has a 10% patient overlap with ALGN and does not compete internationally**
    - ✓ **While SDC's product offering is significantly lower than Invisalign offered through doctors, Invisalign's price to the doctors at $1,245 is actually below SDC's price of ~$2,000. The difference is the doctors are taking a +75% mark-up and charging anywhere from $3,000 to $8,000 for treatment. If doctors feel pressure from SDC, will it be ALGN that reduces price or the doctors…or some combination?**
    - ✓ **You can argue that the DTC model is a potential pricing power opportunity for ALGN. ALGN is letting SDC be the guinea pig that tests the DTC route but if that model proves socially acceptable, ALGN is in good position with its data, scale, and balance sheet to attack SDC and eat into the doctor's 70%+ margins while still lowering the price to end-consumers**
2. Prolonged recession leads to a sharp decrease in case volume growth and a **permanent** re-valuation of the stock
    - ✓ **2007-2012 growth of 12.5% and strong FCF**
    - ✓ **ALGN has no debt and would likely strengthen its competitive advantage in a recession relative to smaller start-ups (e.g. SDC)**
    - ✓ **Large and growing Int'l presence likely insulates ALGN from a US-centric recession**
3. Management turnover/retention → ALGN's stock has performed so well that most of the management team has become very wealthy
    - ✓ **Tenure of team is blended with new and older members**
    - ✓ **Special SMUs for Joe Hogan that vest in 2021 offer a big carrot in the future and gives the Company time to plan succession**
    - ✓ **Performance has been incredible, so recruiting talent should not be difficult**
4. Orthodontists never fully adopt Invisalign for teenage or complex cases
    - ✓ **Adoption rate has trended up and ALGN's recent innovations should support that trend**
5. Poor capital allocation decisions if management cannot find enough high NPV projects to invest in
    - ✓ **Management has been buying back shares with excess cash on the balance sheet though this has mostly been neutral with dilution from management compensation (RSUs and MSUs)**

EXHIBITS

Exhibit I: Top Shareholders

	2014	2015	2016	2017	2018
1)	Gund Gordon	Gund Gordon	Gund Gordon	Vanguard	Vanguard
2)	Blackrock	Ameriprise Financial	Blackrock	Blackrock	Blackrock
3)	Vanguard	Blackrock	Vanguard	Gund Gordon	Gund Gordon
4)	T Rowe Price	AllianceBernstein	Wells Fargo	Wells Fargo	Sands Capital Mgmt
5)	FMR	Vanguard	Wellington Mgmt	State Street Corp	State Street Corp
6)	BNY Mellon	William Blair & Co	Polen Capital Mgmt	Polen Capital Mgmt	Renaissance Technologies
7)	Danaher Corp	Wells Fargo	Ameriprise Financial	Renaissance Technologies	Wellington Mgmt
8)	William Blair & Co	BNY Mellon	Lone Pine Capital	BNY Mellon	FMR
9)	Kornitzer Capital Mgmt	State Street Corp	State Street Corp	T Rowe Price	Polen Capital Mgmt
10)	AllianceBernstein	Jennison Associates	BNY Mellon	Invesco	BNY Mellon
# of Analysts	12	12	13	12	16

Exhibit II: Company History

Align Technology was formed in 1997 by two Stanford MBA students, Zia Chishti and Kelsey Wirth. Neither founders had prior professional experience in orthodontia—they both came from banking and consulting backgrounds—yet both had gone through the uncomfortable experience of having braces as young adults. Through this experience, they saw the potential for using a near-invisible plastic retainer in place of traditional braces, and using software as a way to drive the treatment process. Thus, Invisalign.

The Company was initially funded by VC and PE firms like Kleiner Perkins and Gund Investment Corporation and quickly went public in 2001. Joe Lacob, a former partner at Kleiner Perkins, and Gordon Gund are still significant investors in ALGN today and Mr. Lacob has been on the Board since inception. Mr. Gund is represented on the Board by his long-time associate, Warren Thaler, who has been on the Board since 2004.

Mr. Chishti stepped down as CEO in 2002 after a tumultuous first year as being a public company (stock fell approximately 90%) and left the Company all together the following year. He was replaced by Thomas Prescott, who ran ALGN as President and CEO for more than 13 years until his retirement in June 2015 (still on the Board). Joe Hogan, the former CEO of ABB Corp and GE Healthcare, replaced Mr. Prescott as ALGN's CEO.

<u>Value Proposition</u>

ALGN's original value proposition was threefold:

1) **<u>Patients:</u>** Invisalign provides patients with a more aesthetically-pleasing solution to minor malocclusion with improved dental health and greater convenience;
2) **<u>Doctors</u>**: For Orthos, Invisalign created a quicker procedure which reduced "chair time" for patients, thus improving patient turnover, while also expanding the patient market to include aesthetically-conscious adults. For GPs, Invisalign brought them an entirely new source of revenue because they had previously never treated malocclusion. The ease and high margins of Invisalign were very attractive to them and today there are a lot of GPs who build practices around the Invisalign brand; and
3) **<u>ALGN</u>**: The Company's shareholders would benefit from its first-mover advantage and from establishing Invisalign as the standard method for treating malocclusion instead of wires and

brackets. Twenty-two years later, this is still management's goal for Invisalign but now it is less dream and more reality.

Product

Initially, the Company only intended to sell its product to Orthodontists because those were the doctors patients went to for braces. ALGN was sued in 2001 by a group of GPs, however, and was subsequently forced to train GPs on the Invisalign System. This turned out to be a huge blessing in disguise for the Company, as there are 15-20x as many GPs in the US as there are Orthos. The value proposition to GPs was clear since it was incremental business that did not conflict with their normal business. Since then, many GPs now build their practices around Invisalign.

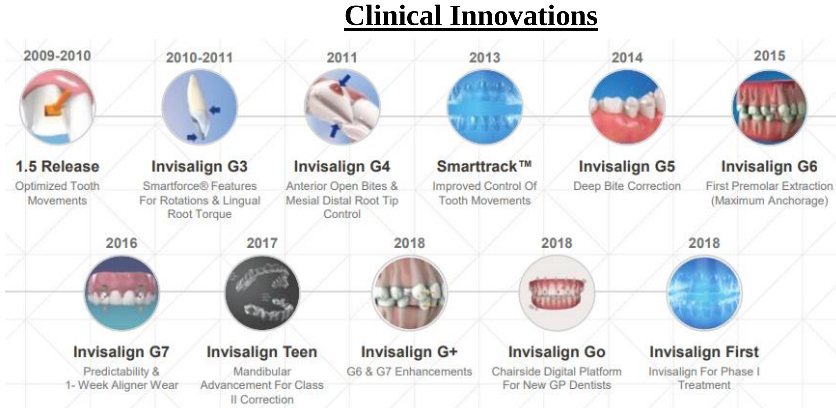
In the beginning, the Invisalign System consisted of two technology components: clear aligners and ClinCheck, an internet-based application software that allows dental professionals to simulate treatment in 3D by modeling two-week stages of tooth movement. The clear aligners were manufactured in a series to correspond to each two-week stage of the treatment process. The treatment process was typically about 44 weeks, which equates to 22 unique upper treys (aligners) and 22 lower treys over the course of the process. Today, the majority of doctors are using the iTero or other intraoral scanners to take 3D imaging of patients' mouths instead of using physical molds. Using scanners is more accurate and more efficient because it only takes a couple minutes to complete (once again, reduces chair time and increases patient churn).

Invisalign could originally only treat patients that suffered from very minor cases of Class I malocclusion and had mature dentition, meaning their jaws were no longer growing. There are three classes, and Class I is the least severe type (low hanging fruit). This represented less than 35% of the total market because most teens do not have mature dentition and teens/children make up ~75% of orthodontic case starts.

The real genius of the Invisalign launch was the marketing plan, which is largely attributable to Zia Chishti. The Company did a massive marketing campaign around the time of the IPO, using both a "pull" and a "push" strategy to advertise directly-to-consumers ("DTC") and to dental professionals ("B2B"). This was revolutionary at the time because it was the first time a dental device company had ever marketed DTC, and ALGN spent 10x more on consumer advertising than the dental industry had ever seen before. So while orthodontists skeptical of the product's efficacy and worried about the negative unit economics of Invisalign vs. traditional braces (Orthos traditionally had 95% gross margins on braces while Invisalign would be 70-80%), they could not ignore the new technology because patients would walk into their office and demand it. Orthos were also at conflict with GPs because Invisalign threatened their business, however the growing TAM through ALGN's DTC marketing somewhat mitigated this fear.

ALGN spent the better part of its first decade trying to establish proof of concept and surviving, but beginning in 2007/2008, new product launches and continual innovation really started taking place. Today, ALGN has a wide portfolio of Invisalign products and software programs that treat a variety of cases. The Company's preferred **Orthos claim they can now treat 75-85% of cases with Invisalign** due to the evolution of product offerings.

Clinical Innovations



Source: 2018 ALGN Investor Day Presentation