22 Stock Pitches

27% CAGR since 2014 *(vs. S&P 500's 11%)*

Sean (Si Hyung) Lee

seanlee21@gsb.columbia.edu

https://www.linkedin.com/in/sean-sihyung-lee/

Columbia Business School

Meta

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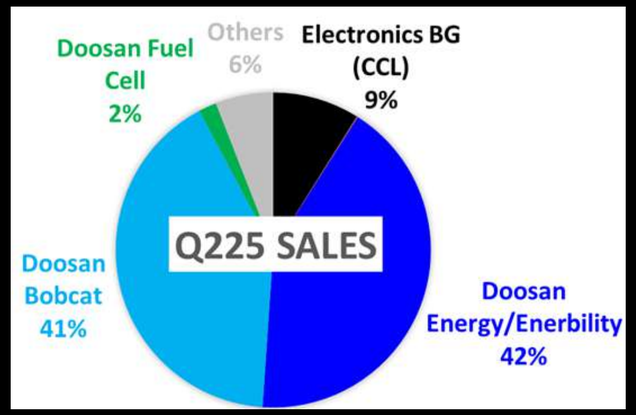
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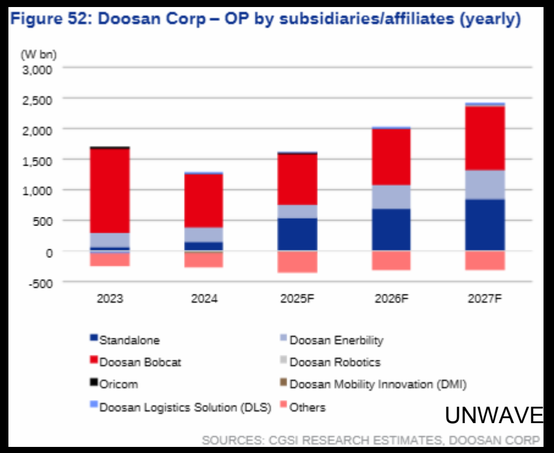
Page #	Position	Name	Industry	Country	Initiation Date	Holding or *Exit* Date	Holding or *Exit* Days	Gross Return	Annual Return	**Alpha**
1-6	Long	Doosan	Search, E-Commerce	Korea	9/11/2025	5/14/2026	245	173%	173%	35%
7-21	Long	TSMC	Foundry	Taiwan	11/1/2023	5/14/2026	925	301%	73%	*224%*
66-67	Long	Broadcom	Semiconductor & B2B SaaS	U.S.	4/21/2020	5/14/2026	2,214	1777%	62%	*1603%*
165-201	Long	Samsung Electronics	Memory Semiconductor, Fab	Korea	12/2/2022	5/14/2026	1,259	390%	59%	162%
327-330	*Long*	*Blue Buffalo*	*Pet Products*	*U.S.*	*6/28/2016*	*2/23/2018*	*605*	*72%*	*39%*	*37%*
74-76	*Long*	*KMW*	*Equipment Manufacturing*	*Korea*	*4/12/2020*	*9/2/2020*	*143*	*37%*	37%	*10%*
68-69	*Long*	*LINE*	*Mobile messenger, FinTech*	*Japan*	*9/27/2019*	*12/24/2020*	*454*	*41%*	*32%*	*19%*
319-322	*Short*	*JC Penney*	*Apparel Retailer*	*U.S.*	*6/28/2016*	*4/12/2019*	*1,018*	*86%*	*25%*	*43%*
315-318	Long	Alphabet	Search Engine, Ads	U.S.	1/12/2014	5/14/2026	4,505	1301%	24%	*994%*
323-326	*Long*	*MasterCard*	*Payment Service*	*U.S.*	*6/28/2016*	*3/21/2025*	*3,188*	*493%*	*23%*	*314%*
165-176	Long	Costco	Wholesale Retailer	U.S.	10/31/2019	5/14/2026	*2,387*	251%	21%	104%
22-65	Long	DaVita	Dialysis Service Provider	U.S.	10/17/2019	5/14/2026	2,401	233%	20%	*83%*
248-299	*Long*	*Nokia*	*System Integrator*	*Finland*	*12/3/2020*	*3/3/2022*	*455*	*23%*	*18%*	*23%*
235-247	*Long*	*Live Nation*	*Live Entertainment, Ticketing*	*U.S.*	*2/16/2021*	*2/18/2024*	*1,097*	*53%*	*15%*	*26%*
77	*Long*	*Copart*	*Salvage Vehicle E-Commerce*	*U.S.*	*1/13/2020*	*10/4/2024*	*1,726*	*95%*	*15%*	*20%*
202-211	Long	Microsoft	Cloud, Game, SaaS	U.S.	6/2/2022	5/14/2026	1,442	53%	11%	*-27%*
142-164	*Long*	*Lamar*	*Digital Outdoor Ads (Billboard)*	*U.S.*	*12/26/2020*	*4/5/2024*	*1,196*	*41%*	*11%*	*1%*
68-69	Long	Naver	Search, E-Commerce	Korea	9/27/2019	5/14/2026	2,421	41%	5%	-248%
70-73	*Short*	*Five Below*	*Discount Retailer*	*U.S.*	*8/16/2022*	*11/18/2022*	*94*	*-12%*	*-12%*	*-4%*
78-84	*Short*	*Nelnet*	*Student Loan Servicer*	*U.S.*	*9/21/2022*	*12/9/2022*	*79*	*-15%*	*-15%*	*-19%*
89-91	*Short*	*Apple*	*Consumer Hardware, Services*	*U.S.*	*2/18/2020*	*7/27/2020*	*160*	*-19%*	*-19%*	*-15%*
92-141	*Short*	*Formula 1*	*Motorsport*	*U.K.*	*8/11/2020*	*3/16/2021*	*217*	*-29%*	*-29%*	*-39%*
17 Longs / 5 Shorts						Average	1,283	245%	**27%**	152%
		S&P 500	*Benchmark*		*1/12/2014*	*5/14/2026*	*4,505*	*251%*	*11%*	

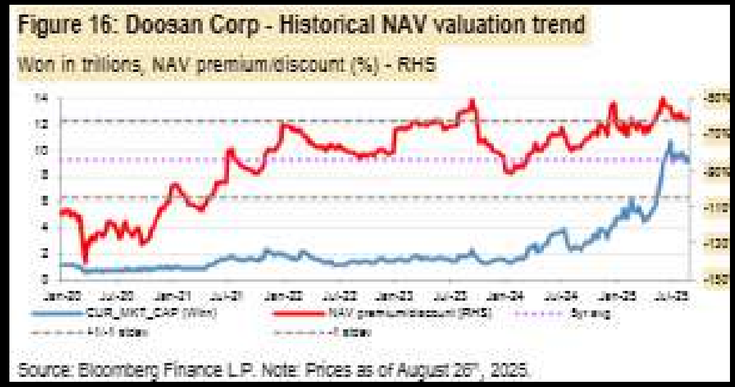
27% CAGR since 2014 (vs. S&P 500's 11%)

Doosan is a Diversified Holding Co: -60% NAV Discount (vs. -40% Avg)

Despite controversial split and merger attempt in 2024, Doosan announced partial cancellation of treasury shares







	Doosan's Ownership	Mkt Cap in KRW Billion	Implied Stake
Doosan Enerbility	30.4%	39,590	12,035
Doosan Robotics	68.2%	3,960	2,701
Oricom (ad, marketing agency)	60.9%	73	44
Bobcat (via Enerbility)	48.2%	5,150	2,482
Tesna (OSAT)	38.7%	671	260
Fuel Cell (via Enerbility)	37.9%	1,770	671
Mobility Innovation	86.1%	--	--
Logistic Solution	100.0%	--	--
Electro-Materials	100.0%	--	--

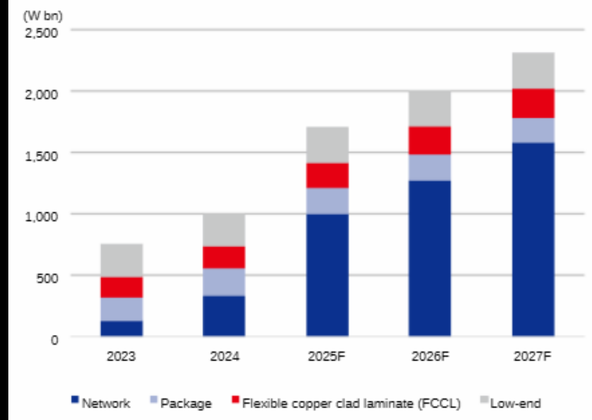
- **Doosan's NAV discount was below -100% 5 years ago:** But the company sold (Infracore, Engine) and spun off (Heavy Industries, Engineering & Construction) assets to payoff debt, narrowing its NAV discount.
- **Although the CCL business constitutes 9% of Doosan's sales, it contributes 35% of Doosan's Q225 EBIT:** By 2030, I estimate the CCL segment to be 11% and 45% of company's total revenue and EBIT respectively.
- **Doosan is levered and has cyclical cash flows: 3.2**x Net Debt/EBITDA as of Q225. 2025 ROIC and ROE are 5% and 2%. Revenue is projected to grow at 9% CAGR through 2030. EBIT margin will increase from 8% in 2025 to 9% in 2030.

- **Korean congress passed 2nd Commercial Code that empowers minority shareholders:** It also sets the stage for more shareholder activism and limits controlling families' use of treasury stock as a defense tool.
- **Proposal to cut dividend tax top rate from 35% to 25%:** Positive news for Doosan shareholders (dividend rate is 0.4%)

Electro-Materials: AI is a tailwind to CCL Business

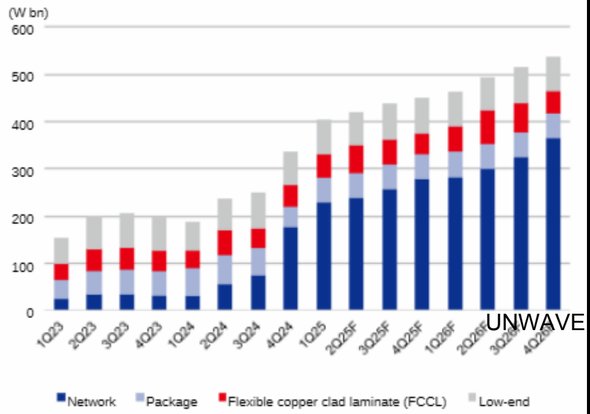
EM is still at the beginning of multi-year investment cycle given the advent of the AI era over the next decade

Figure 38: Doosan Corp – Electro-Materials division sales by application (yearly)



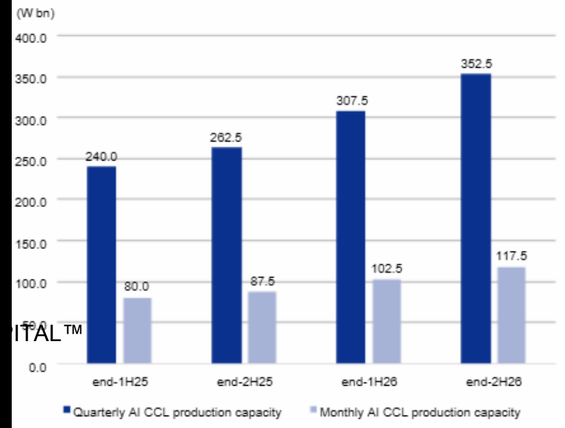
SOURCES: CGSI RESEARCH ESTIMATES, DOOSAN CORP

Figure 39: Doosan Corp – Electro-Materials division sales by application (quarterly)



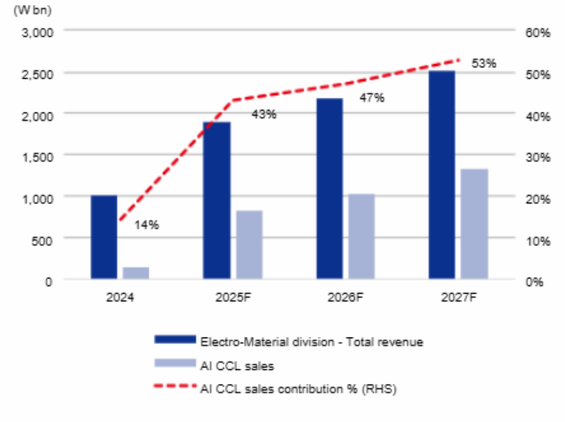
SOURCES: CGSI RESEARCH ESTIMATES, DOOSAN CORP

Figure 6: Doosan Corp – AI CCL production capacity in terms of sales



SOURCES: CGSI RESEARCH ESTIMATES, DOOSAN CORP

Figure 7: Doosan Corp – electro-material division sales and AI CCL sales contribution



SOURCES: CGSI RESEARCH ESTIMATES, DOOSAN CORP

- **Doosan entered the CCL market in the early 2000s:** It supplies producing packaging CCL, communication equipment CCL, and FCCL to domestic and international PCB companies (Daeduck Electronics, Isu Petasys, and Korea Circuit)
- **Expertise in finely adjusting the mixing ratio within the insulting layer of CCL has earned it high regard in the industry:** The performance of CCL is determined by this ratio, which is crucial for applications requiring high reliability and performance (such as AI accelerators)

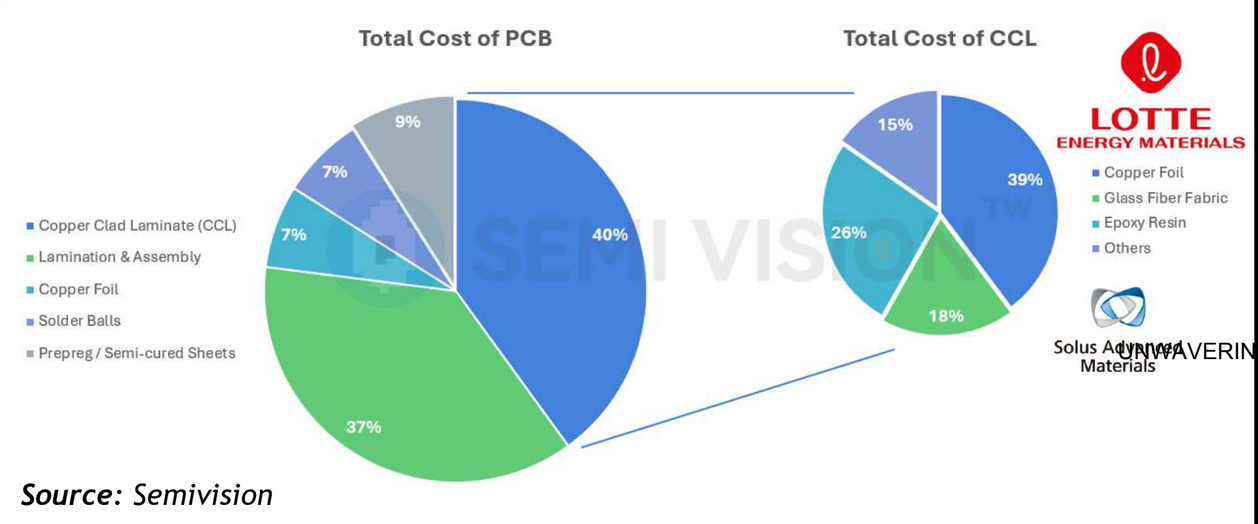
- **81% of revenue is high-end:** Driven by sales of FCCL, Network Board CCL (due to increased sales of GPU and 800G switch) and Semiconductor CCL (improved sales in PKG products such as DDR5/GDDR7, supported by increasing demand for memory)
- **AI CCLs will contribute 53% of sales for EM in 2027:** ZDNet Korea reported that Doosan is spending 3x on CCL equipment to meet demand for its AI CCLs. CEO said Doosan is investing 96B won through 2027 to expand its CCL production lines.

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EM (2) – Dominates the High-End CCL market within the GPU Ecosystem

Gross margin is expected to increase with economies of scale and customer captivity, offsetting rising material costs

CCL=40% of PCB cost (copper foil=39% of CCL cost)



Source: Semivision

- **Lotte Energy Materials and Solus Advanced Materials supply HVLP (Hyper Very Low Profile) copper foil to Doosan:** Lotte produces HVLP 4th class ultra-light copper foil to Doosan
- **Mitsui Kinozoku increased its copper foil price by 15% due to rising demand, energy, and labor costs:** We can deduce that they have some degree of bargaining power over CCL players (rising material costs will be a headwind for Doosan). Doosan also reported rising glass substrate prices.

NVDA's CCL Suppliers

Save	bolded = main share	DGX/HGX Hopper	DGX/HGX Blackwell	GB200
		CCL		
OAM/SXM	CCL Grade	M6	M7	M7/M5
	Supplier	EMC	Doosan (80%), EMC (20%)	Doosan (80%), EMC (20%)
UBB	CCL Grade	M7	M7	-
	Supplier	EMC, TUC, Doosan	Doosan, EMC, TUC	-

Source: SemiAnalysis

- **EMC lost share on Blackwell SXM and Bianca boards to Doosan:** "Likely due to price competition from Doosan. EMC chose not to engage as it achieved full utilization rates in 3Q24 with other high margin projects (ASICs and LEO Satellites)"
- **Doosan and EMC stocks soared 309% and 137% in 1Y:** Although SemiAnalysis predicted that Doosan doesn't have capacity (vs. EMC's 4.3mn sheets/mth capacity in 3Q24) to meet NVDA's demand (1.9M sheets/mth), the market seems to suggest that Doosan is meeting NVDA's demand
- **Doosan is the exclusive supplier for GB300 compute tray:** Expert noted that Doosan CCL prices are 15% higher in the 1H25 vs. 2024 and that NVDA's attempts at supply diversification are limited.

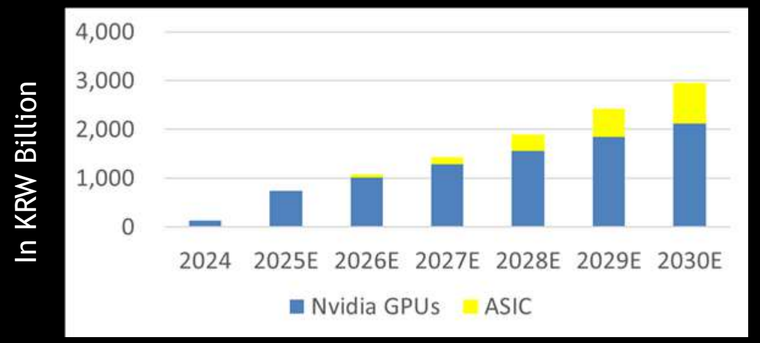
EM (3) – Doosan's CCL will grow at 18% CAGR through 2030

By 2030, high-end CCL will contribute 91% of Doosan's total CCL sales and Doosan's CCL market share will increase to 24%



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Doosan's Network CCL Sales Est. by Customers



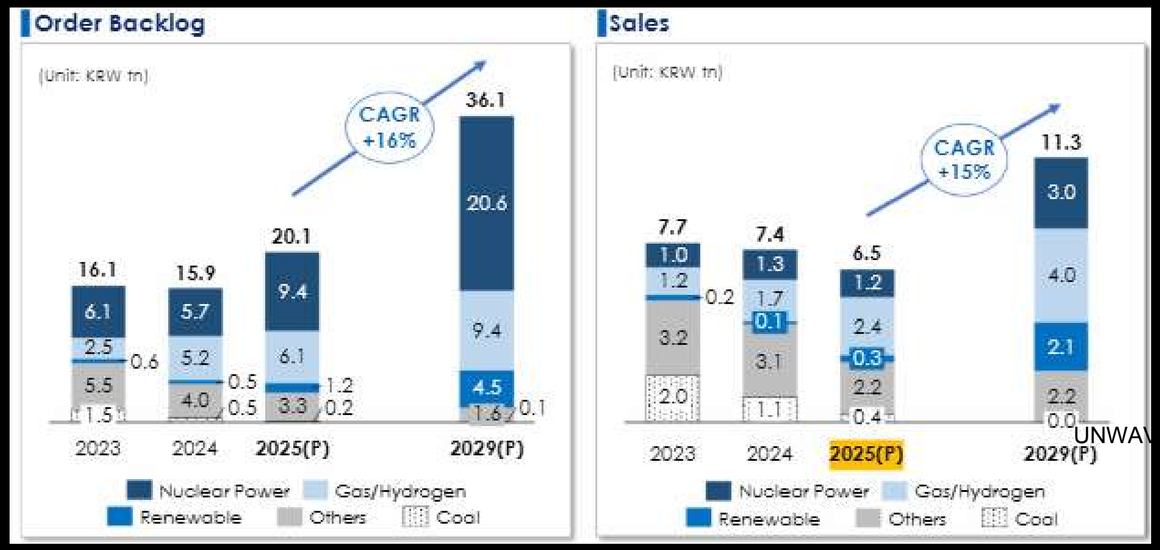
Source: My estimates, Meritz Securities

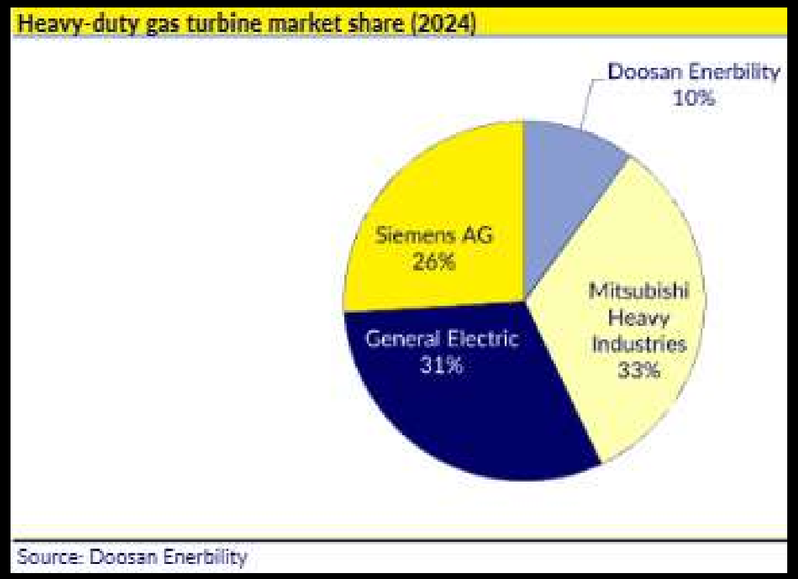
- **Amount of CCL used in AI servers is about 8x that of traditional servers:** The demand for high-end CCL will accelerate with the insatiable demand for AI servers
- **Rubin CCL TAM forecast at $275M in 2026 and $2B in 2027:** GS forecasts that EMC is expected to capture 43% market share of AI GPU CCL TAM in 2027 (15% in M8.5 Computing Tray and 100% in M9 Switch Tray). This figure is higher than EMC's GB300 35% market share (AI rack-level CCL revenue) and 70% Switch Tray market share.

- **Doosan will supply CCL to AMZN (3Q25) and Google (1Q26 likely) for their ASICs:** Annual revenue projected to increase by up to 150B Won. To meet demand, EM is investing 100B Won+ in facility expansion and pursuing M&As.
- **NVDA, Google, and MSFT are leading the adoption of M9-grade CCLs:** EMC and Iteq claim to have passed major product certifications. Due to accelerated spec transitions and limited capacity expansion, concerns are rising that CCL and PCB supply shortages may emerge as a challenge
- **Competition expected:** TUC (AWS), EMC (Google), Panasonic, Shengyi Tech are expanding production capacity to enter the ecosystem of the 4 major US CSPs

Enerbility – 5th Company in the World to Develop Large Gas Turbine

Its vertically integrated EPC (Engineering, Procurement, Construction) and service increases deal size & customer lock-in





Source: *Doosan Enerbility*

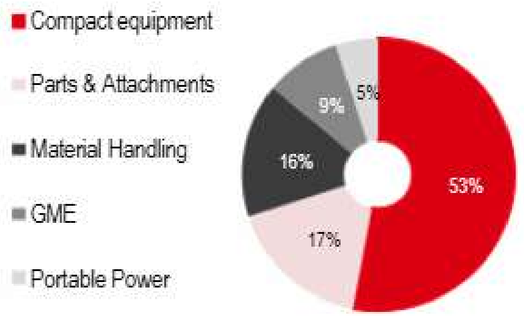
- **$40B Nuclear TAM projected to grow at 5% through 2030:** Enerbility secured a contract for the Czech Dukonvany project and is seen as a strong contender for additional orders from the Czech Temelin project and other European countries
- **As the Small Modular Reactors market grows, Enerbility should take more orders:** It has partnerships with Gen 4 reactor developers – NuScale (pressurized water), X-energy (high-temperature gas-cooled), and TerraPower (sodium fast reactor), highlighting its manufacturing versatility.

- **$37B Heavy-duty gas turbine TAM expected to grow at 4% through 2034:** Enerbility secured $250M to supply steam turbines and power generators to Saudi Arabia and $650M to construct a gas power plant in Vietnam.
- **Enerbility claims that it holds #1 position with a 33% market share in the ultra-large (22.1GW) steam turbines:** Out of the cumulative 5-year orders placed worldwide, having secured 12 units worth of orders (includes 9 that were won in Saudi Arabia since 2024)

Bobcat – Rank 10th in Global Construction Equipment Mkt. with 3% Shr.

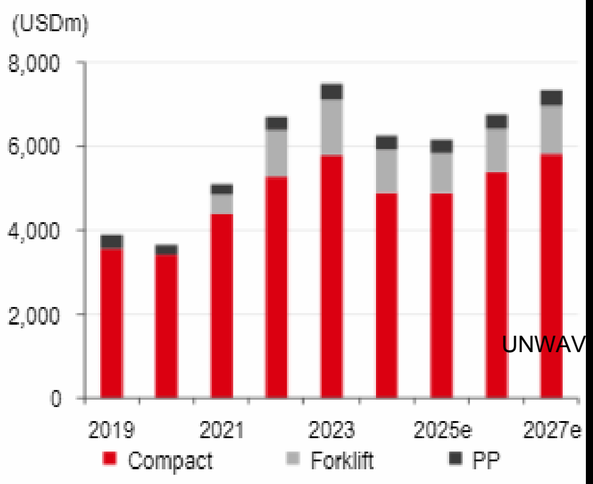
Stand-on mini skid-steer loaders (33% mkt. shr.) and compact track loaders represent a large segment of its product line

Exhibit 9: Doosan Bobcat – sales mix by products



Source: Company data

Exhibit 6: Doosan Bobcat sales trend and forecast by business divisions



Source: Company data, HSBC estimates

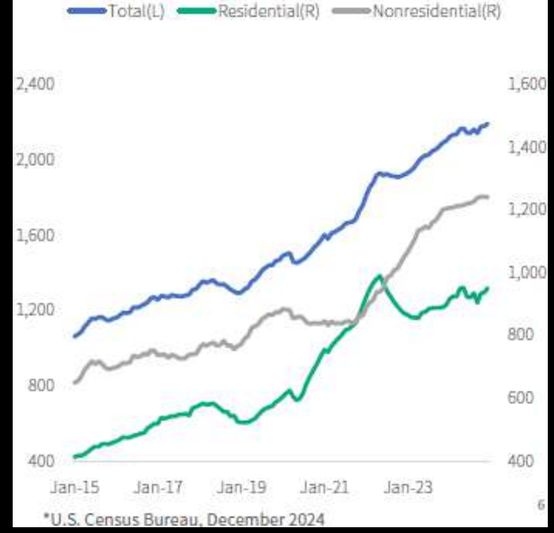
[US Industrial Production & Manufacturing PMI]



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[US Construction Spending]

Units: USD B



*U.S. Census Bureau, December 2024

- **Bobcat is known for extensive accessory ecosystems:** It offers 80+ attachments compatible with 450 applications, making its machines highly versatile
- **Dealer coverage:** Bobcat sells through the largest compact equipment dealer network in North America (where it generates 74% of its revenue), ensuring strong service and parts availability

- **$172B global construction machinery TAM projected to grow at 7% through 2032:** While US industrial production remains solid, economic slowdown in Europe and inventory adjustments caused by US tariff uncertainties pose headwinds for Bobcat
- **Bobcat manufactures 89% of its compact equipment in the US:** Thus, Bobcat is better positioned than some of its competitors. That said, Bobcat has raised concerns over 50% tariffs on steel and aluminum

Price Target – NT$1300 (12% Upside): 2.0x Risk/Reward Ratio

2025 Guidance												
NT$ in B except for ASP					Unwavering Capital				Sell-Side	Mgmt Guidance 3Q25		
	FY-21A	FY-22A	FY-23A	FY-24A	3Q25	NTM Low	NTM Base	NTM High	Base	Low	Base	High
Wafer ASP	99,107	130,589	156,852	194,963	221,182	219,791	225,035	228,244	--	--	--	--
% Growth YoY	4.2%	31.8%	20.1%	24.3%	4.1%	4.0%	6.5%	8.0%	--	--	--	--
Shipment ('000 wafers, 12" equ)	14,180	15,253	12,002	12,911	3,641	13,515	13,850	14,355	--	--	--	--
% Growth YoY	14.4%	7.6%	-21.3%	7.6%	-2.1%	-1.6%	0.9%	4.5%	--	--	--	--
Shipment Utilization	111%	112%	88%	87%	98%	85%	86%	87%	--	--	--	--
Capacity ('000 wafers, 12" equ)	12,733	13,688	14,523	14,909	3,929	15,900	16,059	16,500	--	--	--	--
Wafer Sales	1,405	1,992	1,883	2,517	809	2,970	3,121	3,276	--	--	--	--
% Growth YoY	19.0%	41.7%	-5.5%	33.7%	25.4%	2.3%	7.5%	12.9%	--	--	--	--
Non-Wafer Sales	182	272	279	377	153	588	616	643	--	--	--	--
% Growth YoY	13.0%	49.4%	2.6%	35.1%	33.2%	18.0%	23.6%	29.0%	--	--	--	--
Total Revenue	1,587	2,264	2,162	2,894	962	3,559	3,737	3,919	946	922	940	957
% Growth YoY	18.5%	42.6%	-4.5%	33.9%	26.6%	4.6%	9.5%	15.2%	24.5%	21.4%	23.7%	26.0%
Gross Margin	51.6%	59.6%	54.4%	56.1%	58.0%	55.0%	56.6%	57.0%	56.7%	55.5%	56.5%	57.5%
Operating Margin	40.9%	49.5%	42.6%	45.7%	47.3%	45.0%	46.2%	47.0%	46.9%	45.5%	46.5%	47.5%
Adj. NI	598	1,017	837	1,172	413	1,438	1,567	1,662	399			
as % of Sales	37.6%	44.9%	38.7%	40.5%	42.9%	40.4%	41.9%	42.4%	42.2%			
Adj. EPS	$23.01	$39.20	$32.33	$45.24	$15.92	$55.44	$60.43	$64.08	$15.29			
% Growth YoY		70.4%	-17.5%	39.9%	26.9%	-1.5%	7.4%	13.8%	21.9%			
Forward PEx						15.0x	21.0x	26.0x				
Stock Price						$832	$1,269	$1,666				
Probability						20%	50%	30%				
Stock Price Target (Sep 2026)							$1,301					
% Upside/(Downside)							12.1%					

Stock Price as of 8/28/2025	TWD 1,160	Market Cap *(in B)*	TWD 30,081
Shares outstanding (M) as of 8/14/2025	25,932	Total Debt	TWD 943
Beta 3Y	1.43	Minority Interest	TWD 36
Dividend Yield	1.59%	Cash	TWD 2,365
NTM PEx	19.6x	Enterprise Value	TWD 28,695
vs. 5 Year Avg	19.3x		

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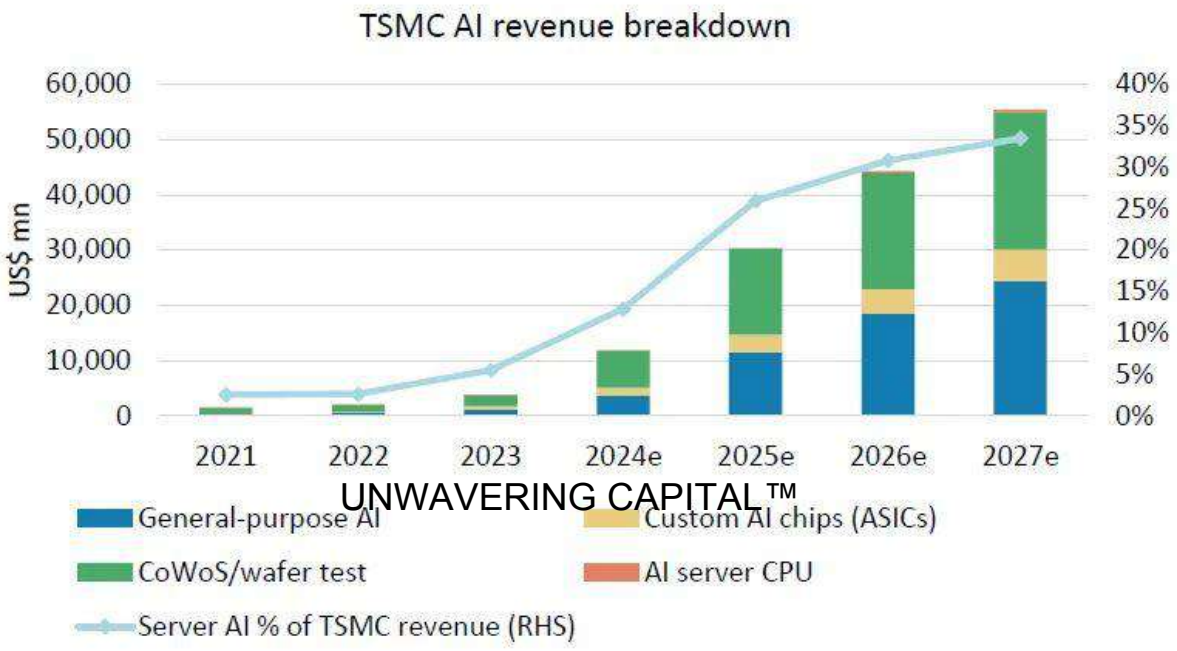
TSMC stock is up 51% since my April 23, 2025 long pitch (vs. S&P 500 up 21% in the same time horizon), generating 30% alpha. Let's explore recent developments that have occurred since Q225 earnings.

TSMC stock slipped 2.5% in Taipei with NVDA reporting soft data center revenue and China risks

- **Investors should shift their attention from NVDA merely missing data center revenue by $200M to Jensen's "$3.5T in AI infrastructure spend by the end of the decade" forecast:** Upward capex revisions by hyperscalers support his remarks. For instance, Google originally planned $75B in capex for 2025 but is now raised to $85B. Meta also recently refined its capex guidance from $64-$72B range to $66-$72B band.
- **While bears point to low ROI on AI spend to argue that cloud providers will moderate their capex, I'd claim that AI revenue is in the early stage of long runway growth and that positive ROI would eventually manifest in the future justifying their continued increase in spending:** MSFT has disclosed that its AI revenue has surpassed $13B annually (11% of Azure revenue, 16% of 2025 capex) representing a sharp 175% YoY. Projections suggest that its FY26 capex could exceed $85-$100B. Meanwhile, analysts

estimate that AI workloads will be $27B in 2025 (21% of AWS revenue, 27% of 2025 capex), growing to $42B by 2027. For Google, forecasts suggest that AI revenue will be $21B in 2025 (38% of Google Cloud, 25% of 2025 capex).

Exhibit 4: TSMC to be the key beneficiary in Asian semis: cloud AI to contribute around 34% of TSMC's revenue by 2027



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Source: Company data, Morgan Stanley Research (e) estimates

Implications of the US government acquiring 10% stake in Intel on TSMC

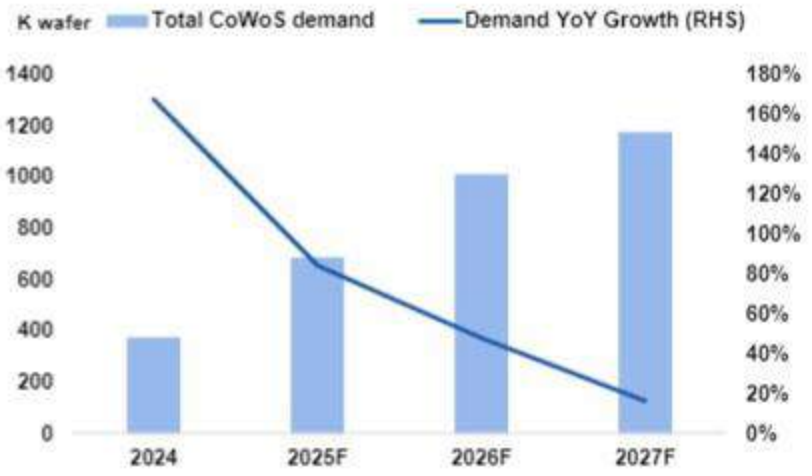
- **Investors are betting that the US will push fabless customers to use Intel foundry:** Report that US will invest $9B in Intel added $24B in the struggling chipmaker's market value. This has Intel trading at 53x forward PE, the highest multiple since the dot-com era. The rise in multiple suggests the market sees Intel Foundry becoming a credible rival to TSMC.
- **While TSMC bulls are dismissing the negative implications of this development will have on the company, I take a more nuanced and cautious view, :** Yes, Intel has lower yield (TSMC N2, Intel 18A, and Samsung SF2 have 65%, 55%, and 40% yields respectively), inherent conflict of interest (vs. TSMC that is a pure foundry), wrong priorities (technical innovation with backside power over yields for chips which don't

necessarily have interference issues), and inferior performance/customer service than TSMC. However, customers who previously refused to go with Intel given the possibility that its foundry will not be viable again (Intel suspended its efforts to offer advanced foundry services to external customers due to challenges in meeting demand in 2018), now have a credible reason to choose the American manufacturer with government's guarantee of Intel foundry's existence (foundry won't be allowed to fail for national security purposes, which lowers perceived customer risk). Moreover, Trump may implement incentives to successfully pressure tech companies to participate in a potential Intel foundry recovery as it did with TSMC (pushing it to invest $165B in the lower margin US facilities).

- **However, some market loss for TSMC would not be an outright negative:** In the current geopolitical environment, the added cost of retaining a 90%+ market share in leading-edge nodes may outweigh the benefits for TSMC. I believe having an illusion of choice for customers may be a more favorable development for TSMC because it can lessen tariff threats and governmental pressure for more reshoring to the US.
- **In the long term, it could be good news for TSMC that US took a stake in Intel:** Government's involvement in private business almost always ends badly. Furthermore, Intel's non-US business, which accounted for 76% of its revenue last year (China contributed 29%), may be negatively impacted by the US government being the largest shareholder as this could subject the company to additional restrictions such as foreign subsidy laws in other countries. Intel may also no longer obtain grants from other governments. With the high possibility of these happening in the future, TSMC may be granted higher multiple.

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Figure 2: Strong AI demand driving advanced node and packaging demand

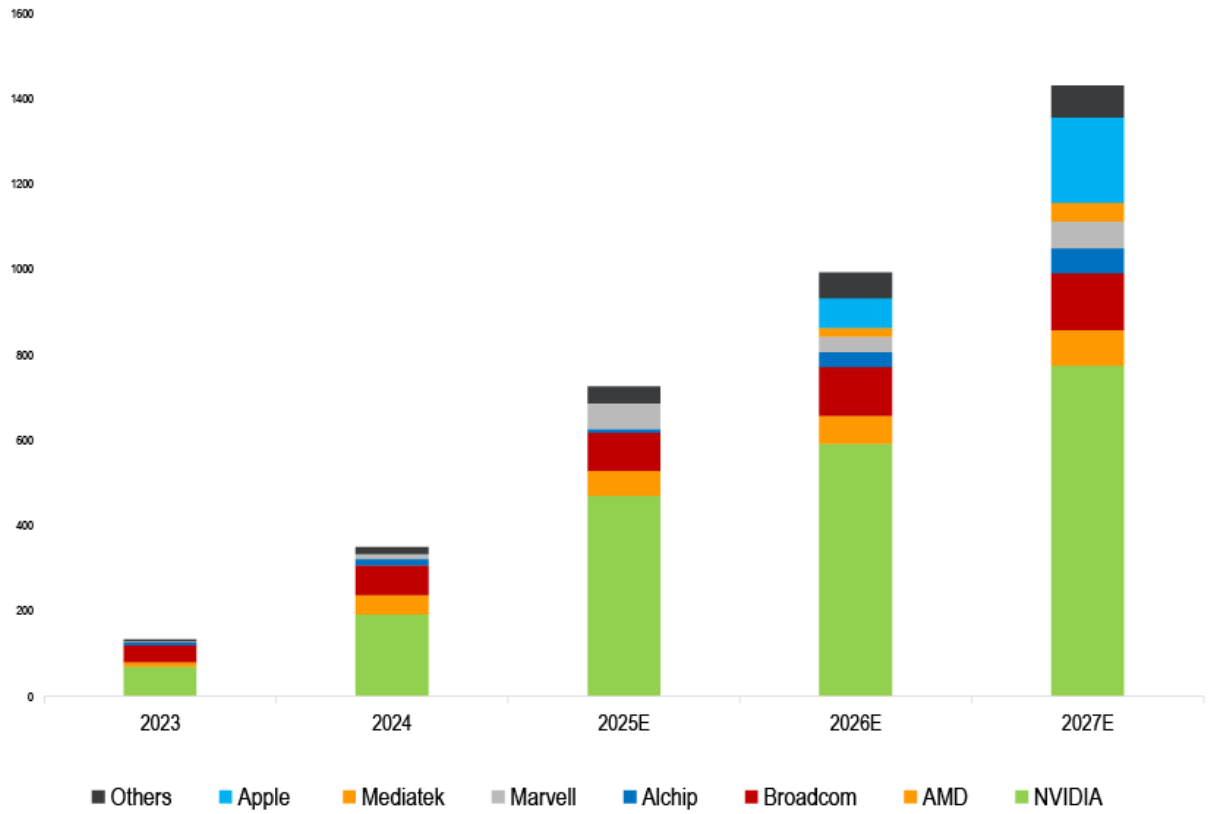


Source: Yuanta Investment Consulting estimates

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July Sales Results – 23% MoM and 26% YoY

- Result puts TSMC ahead of plan with ~34% of expected Q3 sales
- Continued strength in smartphone platforms (N3 especially for Apple) and stable momentum in HPC
- Given that similar strong starts have resulted in TSMC reporting upside in a series of recent quarters, my Q325 revenue (NT$962B) exceeding management guidance of NT$922B-NT$957B seems reasonable
- With the recent 8% uptick in iPhone unit forecasts and Apple's recent relief from tariffs, TSMC could be seeing some upside to 4Q25/1Q26 revenues, which could lead FY26 revenues to approach 35% YoY growth in USD terms



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Tesla signing a $17B multiyear deal with Samsung to make its next-generation A16 chip

- TSMC's US-traded shares declined 1.6% on the news, wiping out ~$16B in market value. I believe it was overreaction given that the impact on TSMC will be only ~1% drop in revenue (TSLA isn't a top 10 customer for TSMC and has historically partnered with Samsung for most of its wafer demand for HW3 and HW4)
- But at the same time, I'll continue to monitor the growing trend where customers are increasingly seeking multiple foundry sources, amid geopolitical risks and capacity concerns (Samsung makes the A14 chip and TSMC will make the A15 chip on N3, Dojo 1 and 2 AI ASICs for TSLA)
- I still believe that TSMC will have 92% market share in the first wave of N2 products

Figure 3: TSMC's sales to top customers rebounded well in 2024 after a decline in 2023 (US$)

TSMC Revenue	2018	2019	2020	2021	2022	2023	2024E	2025E	2026E	2023	2024E	2025E	2026E
Apple	$6,906	$8,158	$11,928	$15,156	$17,753	$17,470	$20,653	$23,013	$25,939	25.2%	22.9%	20.4%	19.6%
AMD	$1,302	$1,232	$3,148	$5,562	$7,572	$7,749	$8,338	$10,310	$13,614	11.2%	9.3%	9.1%	10.3%
Qualcomm	$1,915	$1,994	$3,187	$4,280	$6,574	$6,314	$7,730	$8,151	$8,356	9.1%	8.6%	7.2%	6.3%
NVIDIA	$2,302	$2,024	$2,802	$2,987	$3,144	$5,776	$11,058	$19,463	$26,639	8.3%	12.3%	17.2%	20.2%
Mediatek	$1,423	$1,424	$2,683	$5,114	$4,097	$3,379	$4,339	$4,977	$5,718	4.9%	4.8%	4.4%	4.3%
Broadcom	$3,314	$2,517	$2,686	$3,770	$4,919	$3,743	$4,083	$4,637	$7,018	5.4%	4.5%	4.1%	5.3%
Intel	$1,092	$1,120	$1,792	$2,453	$3,110	$3,274	$7,558	$10,410	$10,436	4.7%	8.4%	9.2%	7.9%
Marvell	$544	$514	$568	$970	$1,293	$1,362	$1,503	$2,401	$2,825	2.0%	1.7%	2.1%	2.1%
Renesas / Intersil / Dialog	$267	$229	$267	$1,087	$1,292	$1,218	$1,055	$1,181	$1,292	1.8%	1.2%	1.0%	1.0%
NXP	$700	$526	$569	$911	$1,167	$1,158	$1,146	$1,334	$1,442	1.7%	1.3%	1.2%	1.1%
TSMC sales from its top 10	$20,600	$19,836	$29,013	$41,361	$52,780	$51,442	$67,462	$85,877	$103,278	74%	75%	76%	78%
TSMC YoY at its top 10	0%	-4%	46%	43%	28%	-3%	31%	27%	20%				
TSMC sales from its top 30	$31,048	$31,220	$41,181	$50,572	$61,790	$59,764	$75,665	$95,368	$113,425	86%	84%	85%	86%
TSMC YoY at its top 30	7%	1%	32%	23%	22%	-3%	27%	26%	19%				
Rest of TSMC/Inventory	$2,404	$3,838	$4,240	$6,235	$14,261	$9,534	$14,335	$17,482	$18,634	14%	16%	15%	14%
Rest of TSMC YoY	-31%	60%	10%	47%	129%	-33%	50%	22%	7%				
TSMC Sales (UBS Estimate)	$33,452	$35,059	$45,422	$56,808	$76,051	$69,298	$90,000	$112,850	$132,059	100%	100%	100%	100%
TSMC Overall YoY	3%	5%	30%	25%	34%	-9%	30%	25%	17%				

Source: Company data, UBS estimates

Risk

- **US production costs 27-45% higher according to KGI:** According to their calculations, production costs for N4 were 100% higher in the US (AZ Fab P1) than in Taiwan (Fab 18A) initially. They allege that with yield improvements and de-bottlenecking, the cost gap can be narrowed to 45%. They also argue that if the Arizona fab is scaled up to the same size as the Taiwanese facilities, the cost gap could be reduced to 27%
- **KGI also claims that gross margin in the US is only 34% (vs. 59% in Taiwan):** They cite 3 major factors of higher US production costs
    - Higher construction costs (5x higher)
    - Higher labor costs (10x higher, given learning curves)
    - Back-end tools and others (including shared facilities, water purification systems)
- **I forecast higher depreciation costs from investing in advanced nodes and building US Facilities**
- **I believe TSMC has strong pricing power to pass on the increased costs to customers:** That said, I do predict continued gross margin contribution for TSMC. However, it should trough in 2H25 (56.3%) and move up in 2026 (57%) with price increases and less dilution from N3.

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Figure 1: Cost comparison estimates of Taiwan (F18A) vs. US Fab (F21)



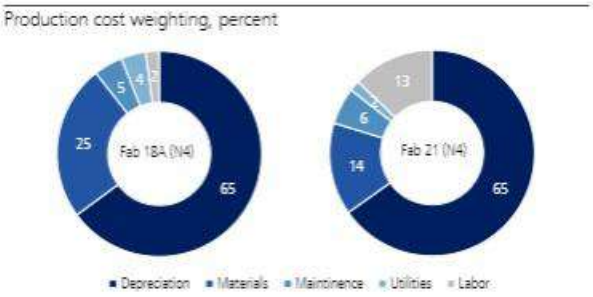
Source: KGI Research estimates
Note: the calculation reflects higher initial costs due to smaller scale of production and learning curves

Figure 2: Cost comparison estimates; initial vs. optimal level (25kwpm)



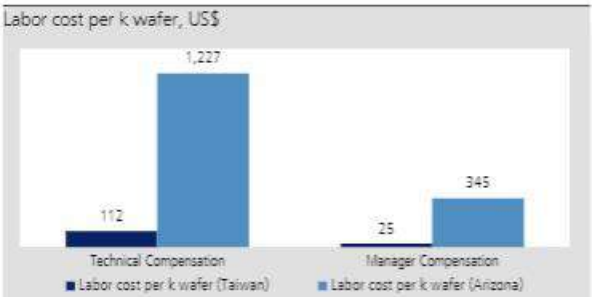
Source: KGI Research estimates
Note: the calculation reflects higher initial costs due to smaller scale of production and learning curves

Figure 3: Cost structure breakdown estimates



Source: KGI Research estimates
Note: the calculation reflects higher initial costs due to smaller scale of production and learning curves

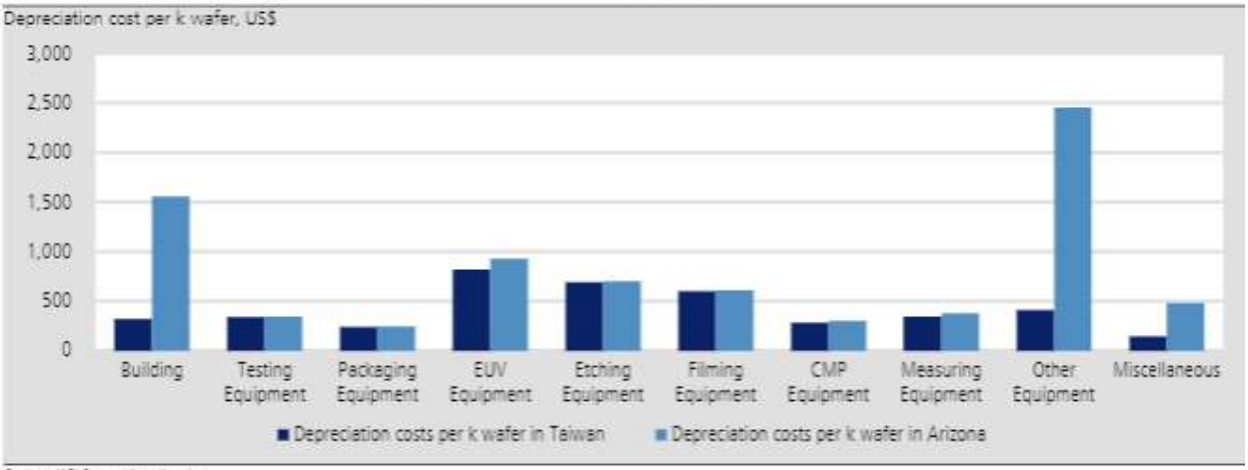
Figure 4: Labor costs are expected to be 10x higher in the US due to inefficiency



Source: KGI Research estimates
Note: the calculation reflects higher initial costs due to smaller scale of production and learning curves

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Figure 5: Depreciation breakdown estimates F18A (Taiwan) vs. F21 (US)



Source: KGI Research estimates
Note: the calculation reflects higher initial costs due to smaller scale of production and learning curves

Valuation

- My base scenario price target is derived from 21x NTM EPS. I believe 8.8% premium to its 5-year average multiple will be supported by positive revenue growth revision

(management projected a 20% CAGR for 2024-2029 but it raised its forecast for the year to 30%), driven by sustained strong demand for its AI products (a strong N2 ramp and rising adoption of N3 for AI ASICs). Also the risk tied to Section 232 tariffs now having diminished (not just for TSMC but also its key customers such as NVDA and Apple) should warrant the stock a premium multiple.

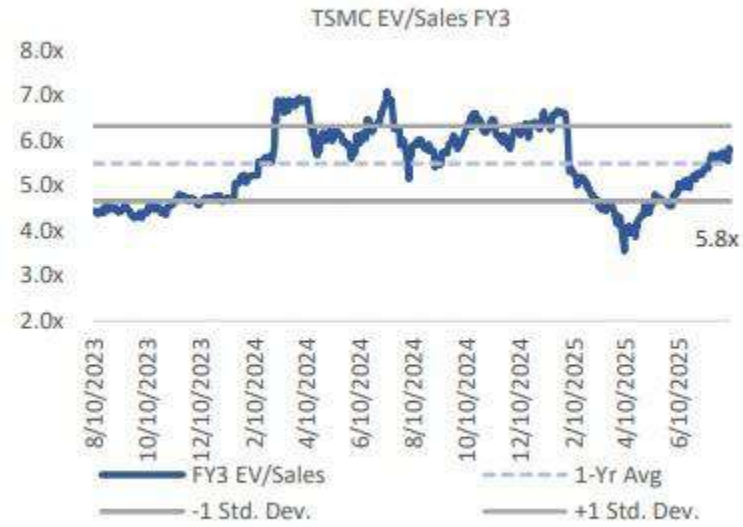
Figure 2: TSMC PE Multiples



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Source(s): Thomson EIKON and Wedbush Securities
Priced 8/8/25

Figure 3: TSMC EV/Sales Multiples



Source(s): Thomson EIKON and Wedbush Securities
Priced 8/8/25

Summary – Long TSMC (29% Upside with 2.5x risk-reward ratio)

	Low	Base	High
TSMC sharing process know-how with INTC	Yes	No	No
INTC no longer outsources & threatens	Yes	No	No
US Chips Act	ITC expires	ITC extension	ITC extension & continued support
Tariffs on semiconductors & uncertainty duration	Yes and for long time	Yes and for long time	No (includes continued suspension)
Probability	20%	50%	30%
NTM Sales YoY Growth	10%	20%	26%
NTM Gross Margin	51%	53%	55%
NTM CFPS	75	89	105
NTM FCF	8.0x	11.0x	13.0x
Price	TWD 600	TWD 979	TWD 1,365
% Upside / Downside	-26%	20%	67%
April 2026 Price Target		**TWD 1,019**	
% Upside / (Downside)		**25%**	
Risk/Reward		2.5x	

Comparing what I had written on my TSMC initiation report and Q125 earnings, I was right about dispelling Intel JV speculation, predicting its strong pricing power during macro headwinds and forecasting its strong fundamentals. However, I was wrong to assume that tariff uncertainties would last for a short period. I now think the ambiguity regarding the Investment Tax Credit and tariff would persist for a longer period. But I still stand firmly on my thesis that TSMC stock presents an attractive entry point for long term investors.

Stock Price as of April 22, 2025	TWD 810
Shares Outstanding (in B)	26
Dividend yield	2.08%
Beta 3Y	1.41
NTM FCF	**9.2x**
vs. 5 year historical avg	**12.1x**

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Q125 Highlights

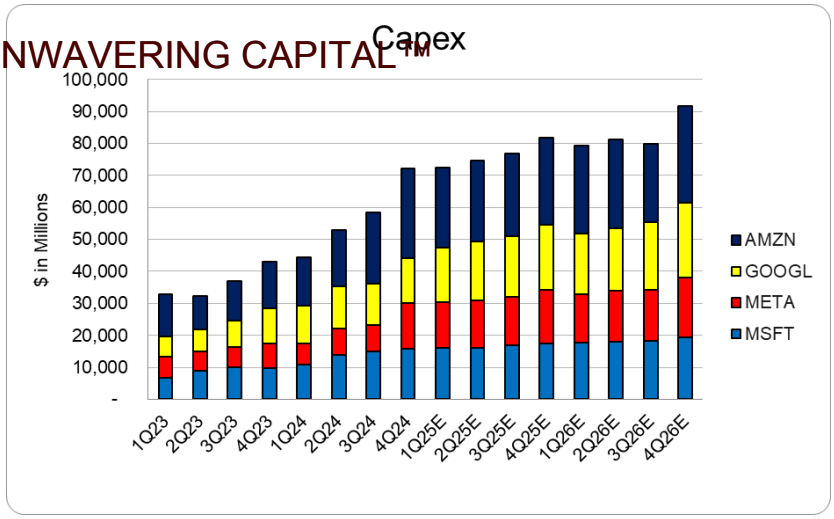
As I accurately dismissed the Intel JV potential, TSMC indicated that it isn't pursuing "any JV technology licensing.": There were persistent speculations by major press and so-called experts that TSMC will be receiving a 20% share in an Intel manufacturing JV through its contribution of tech and personnel. Given that the management dispelled the rumors, investors should no longer factor in the drag such cooperation would have brought to TSMC's operational bandwidth and the threat that it could have been imposed from enabling a competitor.

Despite the market's concerns about the impact of tariffs on TSMC, it hasn't "seen any change in [its] customers' behavior so far.": Although some may say this could be to demand-pull forward, the fact that TSMC hasn't cut its 2025 capex guidance assuages my concern that this may not be the case.

Although TSMC previously guided gross margin dilution from overseas Fabs within the 2-3% guidance range, it is now saying that it will widen to 3-4% in the latter stages (i.e. 2.5~5 years from now) factoring in inflation: Although I was about to assign a lower FCF multiple as of the disappointing revelation, I was reassured by the news that TSMC is "considering raising prices for 4nm chip production at its US facility by as much as 30%". As I noted in my earlier writeup about TSMC's strong pricing power, I believe it has plenty of room to exercise its competitive advantage. Thus, I give the management the benefit of doubt and trust its ability to comfortably meet its gross margin target of 53% and higher.

Investment Thesis

1. Regarding hyperscalers 'pausing' some data center projects, it's important to keep things in context: The headline that MSFT is "slowing" a $1B data center construction in Ohio drove TSMC stock down on fears that a massive infrastructure expansion might not need quite as many powerful chips as expected. However, investors must be cognizant of the fact that the hyperscaler reiterated its plans to stick to spending $80B on AI data centers and the large possibility that its recent scaling back could solely be due to a shift in its close relationship with OpenAI (and not because it expects a declining AI demand from other clients). As MSFT is no longer the exclusive provider of OpenAI's computing power, MSFT could be in the process of halting early-stage projects. Oracle, which is now taking on MSFT's capacity to fulfill OpenAI's needs, has recently signed 2 sizeable lease deals. Thus, OpenAI's robust demands have been shifted to a different cloud provider and have not been diminished.



Similar clarification may be needed for recent news of AWS pausing some new colocation leases. While investors are fully pricing in slowness in computing demand, AWS could have pulled back from a pipeline of LOIs due to a host of other reasons, such as utility power slipping or supply chain constraints. For instance, Google last year walked away from ~2GWs of signed leases and slowed in 2H24, only to reaccelerate meaningfully in early 2025. Since AWS hasn't changed its $100B annual capex plans, investors shouldn't discount the slight possibility of cloud providers growing their spending budgets in 2026 and beyond.

2. There isn't any definitive evidence available yet to determine the ROI of AI spending. Therefore, doubting the sustainability of TSMC's AI orders based on its customers' premature data is wrong: Since NVDA is TSMC's top 2 customer after Apple (I estimate it to contribute 17% of TSMC's 2025E sales), I read NVDA's bear thesis. DA Davidson analyst cited the 1% decline in Microsoft's ROIC from 2023 to 2024 and the low ROAs of CorweWeave and Nebius to make a case that since a surge in GPU spending has only translated into deteriorating returns, NVDA's customers will likely decelerate their AI capex. But there are many errors with this argument. First, ROIC is a lagging indicator, and I believe it's too early to make a trend analysis based on 1 year data. Secondly, a small drop from 21% to 20% may be a reversion to the mean. Moreover, Corweave and Nebius are growth companies that are expected to show low ROI in the early stages of their lifecycle due to their heavy upfront investment business models. Thus, I hope my rebuttal of NVDA's bear narrative by refuting their evidence and, therefore, their claim that customer returns don't appear supportive also dispels TSMC's doubters.

I believe a better guidepost to gauge the robustness of AI demand is TSMC's CapEx guidance. Since the 2025 capital budget remains between $38B and $42B (~70% allocated for advanced process tech), there is no reason not to trust TSMC management's reaffirmation that its revenue from AI accelerators will approach a mid-40s percentage CAGR for the next 5 years period starting from 2024.

in US$M	2023	2024	2025E	2026E	2027E	2028E	2029E
GPUs and Other Accelerators (ASIC, HBM controller for AI training/inference)	2,833	8,301	15,272	22,889	30,765	46,126	62,246
HBM Logic base die	--	--	--	1,223	2,283	3,391	5,336
AI server CPU	82	238	369	581	713	1,053	1,244
AI Networking revenue to Foundry (including Switch, DPUs, Future demand for CPO etc	400	1,400	2,450	3,430	4,288	4,931	5,424
Other processors (FPGA, older and lower end NVDA processors etc)	700	2,310	3,003	3,604	3,964	4,360	4,796
Datacenter AI revenue	**4,015**	**12,248**	**21,094**	**31,727**	**42,012**	**59,861**	**79,046**
Datacenter AI contribution	***6%***	***14%***	***18%***	***23%***	***28%***	***33%***	***36%***
Edge AI revenue (AI PC/smartphone)	**-**	**479**	**1,381**	**2,925**	**5,500**	**8,739**	**13,572**
Edge AI contribution	***0%***	***1%***	***1%***	***2%***	***4%***	***5%***	***6%***
Total AI Revenue	**4,015**	**12,727**	**22,474**	**34,652**	**47,512**	**68,600**	**92,618**
% yoy growth		***217%***	***77%***	***54%***	***37%***	***44%***	***35%***
Total AI Contribution	***6%***	***14%***	***20%***	***25%***	***31%***	***37%***	***42%***

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Source: TSMC mgmt guidance in earnings call, JPM, UBS, International Data Corporation, assumptions adjusted based on my independent research

3. Incremental gains from Intel outsourcing would far exceed any share loss to Intel Foundry in the next 5 years: Intel recently commented about keeping TSMC outsourcing at a reasonably high level in future years as well (currently, it outsources ~30% of its wafer production to TSMC), which is a positive change from 6 months ago, when Intel was planning to bring back all wafers in-house. Deducing prior comments from Intel's Head of Product during its earnings call, I think it's likely that Intel would outsource data center CPUs to TSMC in the medium term and since TSMC's current capacity plans for N2 likely don't factor in big orders from Intel, this could represent upside to TSMC's capacity plans and capex.

TSMC's sales from its top 5 customers				
	2023	2024E	2025E	2026E
1) Apple	25%	23%	20%	20%
2) NVIDIA	8%	12%	17%	20%
3) Intel	5%	8%	9%	8%
4) AMD	11%	9%	9%	10%
5) Qualcomm	9%	9%	7%	6%

Risk & Catalyst

1. Tariff uncertainties will likely persist longer than I initially anticipated: Although I correctly predicted in my previous base scenario with a high 60% probability that tariffs on semiconductor exports would be imposed, I presumed it wouldn't last too long. But I'm afraid that Trump is more unpredictable than I had initially estimated to be. Therefore, I'm lowering my 1-year price target for TSMC from NT$1208 to 1051 to reflect my new hypothesis that Trump-led uncertainties would likely persist throughout his presidential period. However, I still stand firmly on my earlier prediction that TSMC will be exerting its strong pricing power and that its end customers will bear the increased cost. That said, I'm baking a higher possibility of 20% that this would have a -10% negative impact on end-demand (i.e., NTM sales YoY growth), especially in consumer electronics in my downside scenario. But long term investors should take some comfort that now the risk/reward ratio for TSMC is higher from 2.3x in my initial report to 3.0x.

2. Any cuts in 2025 capex guidance by either TSMC or hyperscalers will be my signal to sell TSMC: Many investors have already either erroneously or too prematurely priced in both of these scenarios happening, as mentioned in my report. For one of these events to occur or both, readers should interpret them as signs to indicate that I've been wrong about my analysis of TSMC's strong AI pipeline and it's when to cut our losses.

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Valuation

In the long run, fundamentals are gravity: If you look at the chart of TSMC's stock price, FCF multiple, and NTM CFPS, you'll observe that TSMC business has been generating strong returns (CFPS), as I correctly forecasted in my last initiation report. The recent poor stock performance has been primarily due to the multiple compression, driven by uncertainty around tariffs and fears that the chip demand cycle has peaked. If the next quarters continue to generate stronger-than-expected business results, I believe TSMC's stock price will eventually reflect the fundamentals as it has always been.



Long TSMC (27% Upside with 2.3x risk-reward ratio)

	Low	Base	High
TSMC sharing process know-how with INTC	Yes	No	No
TSMC acquiring INTC's foundry JV	Yes	No	No
INTC no longer outsources & threatens	Yes	No	No
US Chips Act	ITC expires	ITC extension	ITC extension & continued support
Tariffs on exports	Yes and for long time	Yes but for short period of time	No
Probability	10%	60%	30%
FY 26E Sales YoY Growth	9%	20%	26%
FY 26E Gross Margin	49%	60%	62%
FCF	1,757	2,246	2,598
FY 26E FCF Margin	43%	50%	55%
CFPS	68	87	100
NTM FCF	10.5x	13.2x	15.0x
% Upside / Downside	-25%	20%	58%
1 Year Price Target		**TWD 1,208**	
% Upside / (Downside)		**27%**	
Risk/Reward		2.3x	

Stock Price as of March 30, 2025	**TWD 952**
Shares Outstanding (in B)	26
Dividend yield	1.75%
Beta	1.51
NTM FCF	**11.3x**
vs. 5 year historical avg	**12.1x**

Summary

Despite commanding an 80% market share in advanced tech nodes and growing at 20% CAGR over the next 3 years, TSMC is being misunderstood by the market, and its forward FCF multiple is trading at a 7% discount to its 5-year historical average, presenting an attractive entry point. With a margin of safety and stable 25% ROE, TSMC offers a compelling opportunity to earn a 27% upside at a 2.3x risk-reward ratio.

Company & Industry Description

TSMC holds 67% of the $129B pure-play foundry market (in the $70B leading edge nodes—below 7nm—TSMC has 80% market share): Samsung, the distant second player, has just 8% (even when one includes the manufacturing of its chip products, the Korean player only has 15%). The gap between them will widen due to TSMC's structural advantage as the sole independent producer, thereby perpetuating its moat, as TSMC holds 100% of industry profits.

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Why does the opportunity exist?

TSMC's bears, via first-order thinking, speculate that DeepSeek's model upends hyperscalers' approach to spending massive capital expenditures to obtain as many NVDA GPUs as possible, thereby gaining an edge in AI. I beg to differ: As Nadella accurately wrote, "Jevons paradox strikes again" with DeepSeek 's efficient and cheaper model. AI has become increasingly accessible, driving greater adoption across various industries. This AI efficiency, therefore, doesn't reduce chip demand – it rather expands the AI market by resulting in more AI computation and accelerating demand for TSMC's chips. The fact that other cloud service providers have also increased their capital expenditure plans for server hardware in 2025 strengthens my conviction that TSMC's AI growth runway is long. Thus, I've modeled AI accelerators to contribute from 14% of TSMC's 2024 revenue to 42% of its 2029 revenue.

in US$M	2023	2024	2025E	2026E	2027E	2028E	2029E
GPUs and Other Accelerators (ASIC, HBM controller for AI training/inference)	2,833	8,301	15,272	22,889	30,765	46,126	62,246
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% yoy growth		***217%***	***77%***	***54%***	***37%***	***44%***	***35%***
Total AI Contribution	***6%***	***14%***	***20%***	***25%***	***31%***	***37%***	***42%***

Source: TSMC mgmt guidance in earnings call, JPM, UBS, International Data Corporation, assumptions adjusted based on my independent research

Investment Thesis

1. With Intel's new CEO, speculation that TSMC will share its process know-how with Intel and acquire Intel fabs should no longer be a concern. Baird has speculated that TSMC will send its engineers to Intel to share its expertise on the N3 and N2 processes. The press also reported that TSMC has pitched Intel foundry JV to NVDA, AMD, and Broadcom. If these events were to unfold, TSMC would essentially be diluting its power and potentially taking over Intel Foundry, which posted a $12 billion operating loss in 2024. These are legitimate reasons for TSMC's stock to underperform relative to the market YTD. However, with the appointment of a new Intel CEO, who hinted at it in a letter to his employees by vowing to make Intel a top foundry, these negative overhangs should no longer loom over TSMC. Besides, both Nvidia and a TSMC board member recently confirmed that neither had discussed a potential tie-up with Intel for its foundry business. Taiwanese officials have also made it clear that they're going to prevent tech leakages by keeping the most advanced node production within their borders.

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2. Unlike the market, I believe Tan can't change the tide: Intel jumped 15%, and TSMC dropped 3% as investors cheered, hoping that the appointment of Tan will reinvigorate the competition between the two foundries. They point to Cadence's 391% stock returns during his previous tenure as if he could do the same at Intel. However, investors fail to recognize that its direct competitor, Synopsis' stock, performed similarly at 358% during the same time.

in US$M	Gross Margin	R&D	CapEx	R&D as % of Rev	EBITDA	FCF	R&D and CapEx as % of FCF
Samsung	38%	25,683	37,724	12%	54,407	6,284	1009%
Intel	34%	16,546	23,944	31%	7,526	-13,195	-307%
TSMC	56%	6,125	24,999	7%	59,545	34,271	91%

I would also argue that Intel's structural headwinds are a lot worse than that of Synopsis —Intel isn't profitable enough to undercut TSMC (Intel's gross margin is 34% vs. TSMC's 56%), nor can it outspend to catch up with TSMC's tech lead sustainably. For instance, if you look at 2024 numbers, TSMC used 91% of its FCF to fund its capex and R&D. Meanwhile, Intel generated $13 billion in negative FCFs and, despite spending about 2.5x on R&D more than what TSMC has spent, Intel's tech capabilities were so behind such that it has been outsourcing a significant portion of its advanced tech nodes to TSMC. My estimate indicates that Intel contributes 8% of TSMC's 2024 sales and is expected to continue doing so for 2026 sales.

Risks

1. Trump's threats to impose tariffs on semiconductor exports and letting the Chips Act expire will likely persist. But what will also withstand uncertainties are TSMC's structural competitive advantages: Although I acknowledge that TSMC's recent pledge to invest $165B in the US was primarily

intended to gain validation from Trump and these fears should therefore recede, I wanted to conservatively bake in the slight possibility of the US president still letting Investment Tax Credits provision expire and him using tariffs for a short period as his negotiation tool. However, even in this draconian scenario, TSMC can exert its pricing power by passing on all duties and high capex spending to its consumers. Indeed, it will face volume declines due to cost inflation, but it's best positioned to withstand macroeconomic headwinds compared to its peers, which have inferior cost structures, are more reliant on Chips Act subsidies, and are more impacted by Trump's tariffs.

Valuation

DCF is impractical for a cyclical manufacturing company like TSMC, and the P/E ratio overlooks capital expenditures and depreciation. Thus, I use the forward FCF multiple to value TSMC, as it reveals its true cash profitability after accounting for necessary reinvestment. I believe TSMC's gross margin is the best leading indicator of what the forward NTM FCF multiple should be in relation to its historical average. For instance, TSMC's 5-year historical gross margin is 55%. Since my 2026 gross margin estimate is 60%, which is about a 9% premium to the 5-year historical average, I applied a 9% premium to the 5-year forward FCF historical average multiple of 12.1x to derive a 13.2x base multiple.

Income statement					Unwavering Capital		CapIQ Consensus	
NT$ billion (yr-end Dec)	FY21	FY22	FY23	FY24	FY25E	FY26E	FY25E	FY26E
Total Sales	1,587	2,264	2,162	2,894	3,748	4,491	3,703	4,412
yoy growth	*19%*	*43%*	*-5%*	*34%*	*30%*	*20%*	*28%*	*19%*
Non-Wafer Sales (CoWos, SoIC)	182	272	279	394	603	796	--	--
yoy growth	*13%*	*49%*	*3%*	*41%*	*53%*	*32%*	--	--
as % of Sales	*11%*	*12%*	*13%*	*14%*	*16%*	*18%*	--	--
Gross profit	820	1,348	1,175	1,624	2,225	2,693	2,148	2,559
Gross Margin	**52%**	**60%**	**54%**	**56%**	**59%**	**60%**	**58%**	**58%**
DPS (cash only)	10	11	13	17	20	24	18	21
Adjusted O/S (B)	26	26	26	26	26	26	26	26
ROE (single-yr)	27	34	24	27	28	28	31	30
Capex	**(842)**	**(1,156)**	**(903)**	**(833)**	**(1,312)**	**(1,312)**	**(1,301)**	**(1,394)**
Free cash flow	154	530	432	1,142	531	2,246	798	1,312
FCF Margin	10%	23%	20%	39%	14%	50%	22%	30%
CFPS	**6**	**20**	**17**	**44**	**20**	**87**	85	99
% Growth		***245%***	***-19%***	***165%***	***-54%***	***323%***	93%	16%
Dividends paid	(265)	(285)	(338)	(442)	(513)	(623)	(468)	(546)
as % of FCF	173%	54%	78%	39%	97%	28%	59%	42%
Wafer ASP (US$) yoy growth	**10%**	**23%**	**15%**	**20%**	**12%**	**7%**	--	--
Capacity yoy growth	6%	7%	6%	3%	6%	7%	--	--
Utilization yoy growth	7%	0%	-26%	5%	4%	2%	--	--

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Long DVA – 1Y Probability-weighted PT $160 (26% Upside & 2.0x Risk/Reward)

2025 Guidance													
($ and shares in M, except for RPT & EPS)						Unwavering Capital				Sell-Side	Mgmt		
	FY-20A	FY-21A	FY-22A	FY-23A	FY-24A	2025	NTM Low	NTM Base	NTM High	Base	Low	Base	High
# of US Dialysis Treatments (in K)	30,315	29,622	28,954	28,910	29,046	28,781	28,791	28,936	29,081	--	28,756	28,792	28,828
% Growth YoY	-2.3%	-2.3%	-2.3%	-0.2%	0.5%	-0.9%	-0.2%	0.3%	0.8%	--	-1.00%	-0.88%	-0.75%
Revenue per treatment	$351.64	$360.07	$366.06	$378.25	$392.13	$410.42	$412.06	$418.33	$420.42	--	$409.78	$410.76	$411.74
% Growth YoY	0.4%	2.4%	1.7%	3.3%	3.7%	4.7%	3.2%	4.8%	5.3%	--	4.5%	4.8%	5.0%
Total Revenue	**11,551**	**11,619**	**11,610**	**12,140**	**12,816**	**13,688**	**13,796**	**14,037**	**14,159**	**13,426**	--	--	--
% Growth YoY		0.6%	-0.1%	4.6%	5.6%	6.8%	4.8%	6.7%	7.6%	4.8%	--	--	--
Patient care costs per treatment	$238.25	$241.45	$253.29	$255.81	$258.13	$271.86	$279.53	$278.14	$277.31	--	$273.62	$272.33	$271.04
% Growth YoY	-0.5%	1.3%	4.9%	1.0%	0.9%	5.3%	6.1%	4.7%	3.4%	--	6.0%	5.5%	5.0%
Adj. OI (EBIT)	**1,746**	**1,797**	**1,440**	**1,710**	**1,981**	**$2,204**	**$1,931**	**$2,350**	**$2,407**	**2,087**	**2,010**	**2,085**	**2,160**
% Growth YoY	-1.3%	2.9%	-19.9%	18.7%	15.8%	11.2%	-3.5%	17.4%	20.2%	5.4%	1.5%	5.2%	9.0%
Margin	15.1%	15.5%	12.4%	14.1%	15.5%	16.1%	14.0%	16.7%	17.0%	15.5%	--	--	--
Diluted Weighted Avg. Shares	119,702	108,000	95,834	93,182	87,274	70,685	70,399	69,385	67,305	--	--	--	--
% Reduction YoY		-9.8%	-11.3%	-2.8%	-6.3%	-19.0%	-9.0%	-10.3%	-13.0%	--	--	--	--
Leverage Ratio	3.27x	3.24x	3.88x	3.14x	3.01x	3.42x	--	3.27x	--	3.52x	3.50x	3.25x	3.00x
Adj. EPS (diluted)	**$7.43**	**$9.28**	**$6.55**	**$7.67**	**$9.68**	**$11.19**	--	**$13.18**	--	**$10.25**	**$10.20**	**$10.75**	**$11.30**
% Growth YoY	28.5%	24.9%	-29.4%	17.1%	26.2%	15.6%	--	29.9%	--	5.9%	5.4%	11.1%	16.7%
FCF	1,187	1,132	817	1,236	1,161	1,034	--	1,926	--	1,083	1,000	1,125	1,250
Adj. FCF (FCF-SBC)	**1,096**	**1,030**	**722**	**1,124**	**1,058**	**904**	**1,380**	**1,791**	**1,982**	--	--	--	--
as % of Revenue	9.5%	8.9%	6.2%	9.3%	8.3%	6.6%	10.0%	12.8%	14.0%	--	--	--	--
Adj.CFPS	**$9.16**	**$9.54**	**$7.53**	**$12.06**	**$12.12**	**$12.79**	**$19.60**	**$25.81**	**$29.45**	--	--	--	--
Forward CFPSx							5.5x	6.5x	7.5x		--	--	--
Stock Price							108	168	221				
Probability							30%	50%	20%				
Stock Price Target (August 2026)								**$160.40**			--	--	--
% Upside/(Downside)								**25.6%**			--	--	--

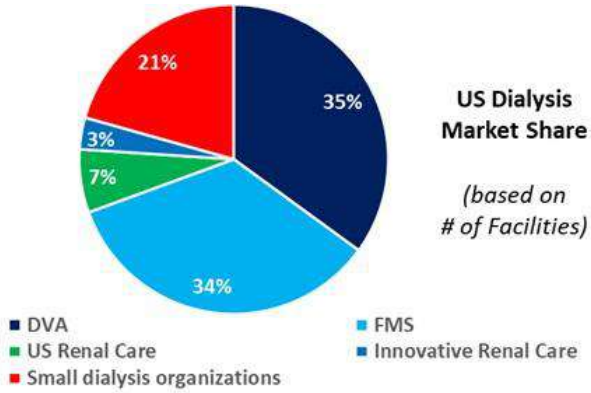
Stock Price as of 8/7/2025	$127.69	Market Cap *(in M)*	$9,130
Diluted shares outstanding (M) as of 8/5/2025	71.5	Total Debt	$10,330
Beta 3Y	0.54	Operating lease liabilities	$2,554
Short interest as % of shares outstanding	7.9%	Minority Interest	$1,661
NTM CFPSx	5.8x	Cash	$828
vs. 5 Year Avg	6.5x	Enterprise Value	$22,847

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Summary

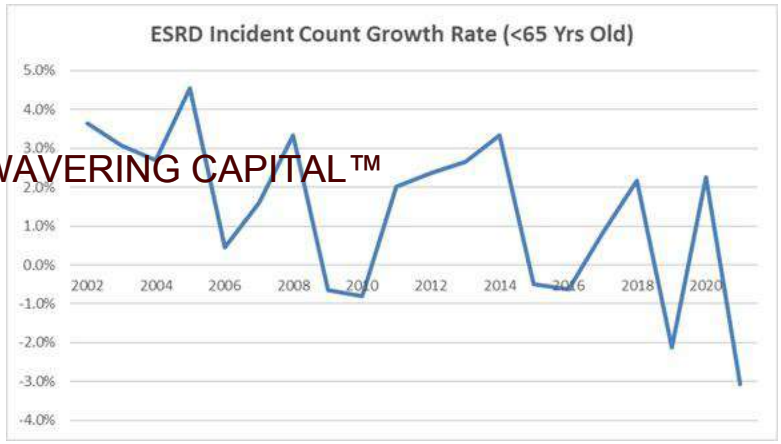
This is a company I have monitored since 2020, and it has generated 51% alpha for me since my initiation report (November 1, 2023), as my contrarian thesis has played out. Given that DaVita (DVA) generates 89% of its revenue in the US and provides life-threatening services, DVA serves as a safe haven during tariff-war uncertainties, a weakening US dollar, and an expected recession. Furthermore, the company has bought 54% of its shares since 2017 and commands 52% ROE and 34% market share in the duopoly dialysis market with a wide moat. With a 17% upside potential and a 1.8x risk-reward ratio, DVA is an ideal investment.

Industry & Company Overview



DVA dominates the duopoly US dialysis market: DVA and Fresenius Medical Care (FMS) have 35% and 34% market shares, respectively (based on the number of dialysis facilities), while the distant third and fourth players, US Renal Care and Innovative Renal Care (used to be known as American Renal Associates) have 7% and 3%, respectively.

DVA and FMS both have great bargaining power with insurance and pharmaceutical companies and 45+ years of valuable patent data. But since FMS has a thinner margin by also having a capital-intensive dialysis machine business and generates more revenue outside the US, DVA is the better vehicle to play the US dialysis market.



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Business segments: While the US dialysis business contributes 89% and 107% of DVA's revenue and EBIT, respectively, the IKC (Integrated Kidney Care) business generates 4% and -2% of DVA's revenue and operating profit. IKC, also known as the value-based care business, is expected to break even (operating income) by 2026. International operation constitutes 7% and 3% of DVA's revenue and EBIT. With 509 outpatient dialysis centers located in 13 countries outside of the U.S., the international business will also add to DVA's EBIT as their operating margin will resemble to that of the US operation.

Why does this opportunity exist?

Despite beating Q225 earnings expectations and demonstrating lower-than-feared patient care cost (better labor productivity worth ~$100M EBIT), the DVA stock price has plummeted by 26% in the past 6 months. The drop is primarily due to the risk I correctly anticipated in my previous writeup, but failed to fully capture its magnitude – negative 2025 US patient treatment volume growth, led by a high mortality rate and high missed treatment

rate (both due to flu season). However, while the nearsighted market is focused on lowered guidance on the negative patient outflow for 2H 2025, we should be more attentive to the forecast by DVA and FMS of 2%+ US volume growth between 2026 and 2035. This is especially true as the CDC recently reported that the flu season has largely wound down.

	2019	2020	2021	2022	2023	2024	2025	2026
	FY	FY	FY	FY	FY	FY	FY	FY
US Dialysis Treatments *(in K)*	30,173	30,315	29,622	28,954	28,910	29,046	28,781	28,928
Treatment Growth YoY	*2.5%*	*0.5%*	*-2.3%*	*-2.3%*	*-0.2%*	*0.5%*	*-0.9%*	*0.5%*

Investment Thesis

1. The thesis that medical innovations will be a net tailwind to long-term treatment volumes due to reduced mortality is still intact: In my previous write-ups, I highlighted how medications like GLP-1 will reduce cardiovascular mortality since 6 times more CKD patients die of cardiovascular disease than progress to kidney replacement therapy. This would create a larger population that could potentially be incident on ESRD, offsetting some of the impact of incident delay.

Recently, there has been more overlooked evidence that suggests higher dialysis patient survival and fewer missed treatments in the future. For instance, DVA expects to deploy an FDA-cleared hemodiafiltration machine, 5009X, in 2026. According to the CONVINCE study, patients who received just 3 months of treatment from this machine resulted in 4.4% fewer deaths over 2.5 years of follow-up. Other real-world evidence shows that this new therapy option also comes along with reduced hospitalization rates as well as improved quality of life and outcomes for patients, which is expected to reduce the number of missed treatments. Indeed, it may take more than 5 years to achieve a meaningful impact on results due to the time required for independent nephrologists to adopt new technology, combined with manufacturing capacity. But since the bear's thesis hinges on DVA's low terminal value due to lower ESRD incidence and slow progression from late-stage CKD to ESRD (with higher penetration of GLP-1), these innovations help me build conviction that the 2%+ long term US volume growth is feasible and investors will eventually re-rate DVA stock once we gradually see the financial benefits from these technologies.

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	2019	2020	2021	2022	2023	2024	2025	2026
	FY	FY	FY	FY	FY	FY	FY	FY
Total U.S. patients served (# of patients)	206,900	209,945	208,182	199,400	200,800	202,106	203,489	203,712
% growth - U.S. patient (QoQ)	*2.1%*	*1.5%*	*(0.8%)*	*(4.2%)*	*0.7%*	*0.7%*	*0.7%*	*0.1%*
# of US Patients/Center	75.2	74.6	74.0	73.2	75.1	76.1	77.1	77.5
# of Patients on Gov. Pmts (75% Medicare/MA, most 65+ yrs old)	184,373	183,702	182,801	177,801	179,189	179,314	181,690	182,176
Implied Proportion of Total US Patients	*89.1%*	*87.5%*	*87.8%*	*89.2%*	*89.2%*	*88.7%*	*89.3%*	*89.4%*
# of Est. Incident Patients who already have Medicare	11,783	11,414	12,267	11,480	10,446	11,443	11,576	11,581
# of Est. Patients transferred from Commercial Payor	31,555	33,476	34,140	33,942	17,214	34,492	34,628	34,665
# of Est. Patients who Die	(37,428)	(39,496)	(40,216)	(39,116)	(39,870)	(34,070)	(32,704)	(32,792)
# of Est. Patients who receive Transplants	(8,264)	(7,927)	(8,852)	(8,845)	(8,824)	(9,870)	(10,175)	(10,384)
Total # of Est. Gov Payor	183,702	182,801	177,801	179,189	179,314	181,690	182,176	185,246
% of Mortality Rate of Gov Payors	20.3%	21.5%	22.0%	22.0%	22.3%	19.0%	18.0%	18.0%
# of Patients on Commercial Insurance (beg)	22,527	26,243	25,381	21,599	21,611	22,791	21,799	21,536
Implied Proportion of Total US Patients ("Commercial Mix")	*10.9%*	*12.5%*	*12.2%*	*10.8%*	*10.8%*	*11.3%*	*10.7%*	*10.6%*
# of Est. Patients who begin dialysis (new Incident/admits)	39,885	38,994	40,861	40,015	39,666	38,629	39,183	39,534
# of Est. Patients transferred to Gov Payor (30 month coordination)	(31,555)	(33,476)	(34,140)	(33,942)	(33,521)	(34,492)	(34,628)	(34,101)
# of Est. Patients who Die	(3,604)	(5,249)	(5,203)	(4,385)	(3,900)	(3,875)	(3,597)	(3,489)
# of Est. Patients who receive Transplants	(1,010)	(1,132)	(1,229)	(1,075)	(1,064)	(1,254)	(1,221)	(1,228)
Total # of Est. Commercial Payor (End)	26,243	25,381	21,599	21,611	22,791	21,799	21,536	22,253
	12.7%	12.1%	10.4%	10.8%	11.4%	10.8%	10.6%	10.9%
% of Mortality Rate of Commercial Payors	16.0%	20.0%	20.5%	20.3%	18.0%	17.0%	16.5%	16.2%
Total # of Patients who Die	(41,032)	(44,745)	(45,419)	(43,501)	(43,770)	(37,944)	(36,301)	(36,280)
% of Mortality Rate	19.8%	21.3%	21.8%	21.8%	21.8%	18.8%	17.8%	17.8%
Excess Deaths Post Covid vs. Pre-COVID (2019)					2,738			

2. Investors have penalized DVA for the cyberattack too harshly: While DVA stock plunged by -26% in the past 6 months, FMS share only fell by -0.4% because of the differences in their 2025 volume guidance. Whereas FMS expects it to be flat or slightly positive, DVA forecasts a YoY decline of 75 to 100 basis points (previous guide of down 50bps). We can, therefore, deduce that bears are pricing in April ransomware, the key driver of DVA's negative outlook, as an idiosyncratic risk. However, I believe that the incident shouldn't be an indication of a large cybersecurity investment required in the future, as DVA management confirmed. Also, DVA should not be regarded as a weaker operator because FMS has struggled with cyberattacks in the past as well. Instead, it should be regarded as a systematic risk, resulting in a one-time $55M EBIT hit (10% of Q225 EBIT) and 550 fewer patient admits this quarter. We should eventually see similar volume guidance from the duopolies for 2026 and beyond once the impact of the cyber incident is behind us. Moreover, investors should be mindful of $13M-$83M insurance recoveries from the cyberattack that will be received in the NTM.

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3. Berkshire's DVA stock sale is not a sign that Warren Buffett no longer believes in its upside, and misinformation likely led some to sell DVA: The dialysis company agreed to buy back stock from Berkshire when the ownership by Buffett's firm topped 45%. I attribute the motivations behind this move to the fact that Berkshire doesn't want to trigger extra scrutiny from regulators and creditors by owning a politically sensitive healthcare provider. Moreover, Berkshire probably doesn't want to report DVA's heavy debt load (~$13B) on its

balance sheet by becoming a controlling shareholder (over 50% ownership would require a consolidation method, lowering its ROE). The key reason why I have a strong conviction about this is because Berkshire investment manager Ted Weschler hasn't personally sold any DVA shares and still maintains 3.1% ownership.

Barron's August 5th, 2025 article erroneously reported that Berkshire has reduced its DVA stake to 42% when Capital IQ notes that Berkshire has only trimmed its holdings to 44.98%. I suspect that due to the incorrect news, some of Buffett's followers may have misinterpreted Berkshire's routine sale as the start of major sales and sold their DVA stocks as well. I believe investors shouldn't misread Berkshire's moves and instead focus on DVA's recurring and stable FCF generation and accretive share buybacks.

	2025				2026			
($, shares, and treatments in M, except for per share)	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Basic Shares	81,569	79,739	78,206	74,389	72,537	70,685	68,833	66,981
(Buyback)	(3,660)	(3,067)	(7,634)	(3,704)	(3,704)	(3,704)	(3,704)	–
Basic Shares - End	**77,909**	**76,672**	**70,572**	**70,685**	**68,833**	**66,981**	**65,129**	**66,981**
Avg Basic Shares Outstanding	79,739	78,206	74,389	72,537	70,685	68,833	66,981	66,981
% Share Count	-2.2%	-1.9%	-4.9%	-2.5%	-2.6%	-2.6%	-2.7%	0.0%

Risk

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1. Mortality rate may remain elevated in the short term due to the resurgence of COVID: As of August 5, 2025, the CDC reported that COVID infections are growing in 45 states as children begin returning to school and as officials plan to restrict booster shots. While cases are increasing less quickly than at the start of other surges, it is too soon to tell how big the current late-summer wave could get – and with highly varied immune responses from prior infections and vaccinations, it is difficult to know how severe illness could be. To account for the possibility of elevated death rates and missed treatments among dialysis patients, I have modeled a -1.3% volume growth for NTM in my bear scenario.

Valuation

I applied a 6.5x forward CFPS multiple in my base scenario to obtain my price target: This is a conservative estimate because 6.5x is DVA's 5-year historical average multiple and adj. CFPS is obtained by subtracting SBC from FCF. I believe the market will grant DVA this premium within the next year once it guides strong revenue guidance that offsets the continued weakness in the short-term US treatment volume. DVA has many levers to do so. For instance, DVA has been using AI for dosing of certain drugs (which is in full swing), and

is in the testing stages of using AI to gather clinical information and to be used for ambient listening. The company also utilizes AI in call centers for outbound calls related to prior authorization and for claims processing. We should see positive ROI on DVA's results from these initiatives in the next year.

($, shares, and treatments in M, except fee per share)	2019 FY	2020 FY	2021 FY	2022 FY	2023 FY	2024 FY	2025 FY	2026 FY
Leverage Ratio	2.90x	3.27x	3.24x	3.88x	3.14x	3.01x	3.42x	3.17x
Adj. FCF (FCF-SBC)	$1,059	$1,096	$1,030	$722	$1,124	$1,058	$904	$1,510
% YoY Growth	*32.9%*	*3.5%*	*-6.0%*	*-29.9%*	*55.8%*	*-5.9%*	*-14.5%*	*67.0%*
Adj. CFPS	$7.14	$9.16	$9.54	$7.53	$12.06	$12.12	$11.87	$21.76

I also built a DCF model and public comps analysis as sanity checks: I used 6.5x NTM EBITDA to obtain my terminal value. This, once again, is a conservative estimate because DVA's current NTM EBITDA is 8.3x.

	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	Terminal
Revenue per Treatment	$350.07	$351.64	$360.07	$366.06	$378.25	$392.13	$410.42	$418.66	$427.48	$436.92	$447.01	$457.77	
% YoY Growth	*-0.3%*	*0.4%*	*2.4%*	*1.7%*	*3.3%*	*3.7%*	*4.7%*	*2.0%*	*2.1%*	*2.2%*	*2.3%*	*2.4%*	
# of US Treatments (in K)	30,173	30,315	29,622	28,954	28,910	29,046	28,781	28,928	29,162	29,485	29,901	30,411	
% YoY Growth	*2.5%*	*0.5%*	*-2.3%*	*-2.3%*	*-0.2%*	*0.5%*	*-0.9%*	*0.5%*	*0.8%*	*1.1%*	*1.4%*	*1.7%*	
Other Revenue	826	891	952	1,010	1,203	1,425	1,861	2,004	2,164	2,344	2,545	2,772	
% YoY Growth	*-22.8%*	*7.9%*	*6.9%*	*6.1%*	*19.1%*	*18.5%*	*30.6%*	*7.7%*	*8.0%*	*8.3%*	*8.6%*	*8.9%*	
Revenue	11,388	11,551	11,619	11,610	12,140	12,816	13,688	14,120	14,630	15,227	15,911	16,693	
% YoY Growth	*-0.1%*	*1.4%*	*0.6%*	*-0.1%*	*4.6%*	*5.6%*	*6.8%*	*3.2%*	*3.6%*	*4.1%*	*4.5%*	*4.9%*	
EBIT	1,768	1,746	1,797	1,440	1,710	1,981	2,204	2,144	2,193	2,251	2,321	2,402	
% Margin	*15.5%*	*15.1%*	*15.5%*	*12.4%*	*14.1%*	*15.5%*	*16.1%*	*15.2%*	*15.0%*	*14.8%*	*14.6%*	*14.4%*	
Less: Taxes	(280)	(314)	(307)	(198)	(220)	(280)	(361)	(382)	(390)	(401)	(413)	(428)	
Add: D&A	615	630	681	733	745	724	639	682	707	736	769	807	
Less: Capex	(767)	(675)	(642)	(603)	(569)	(556)	(492)	(514)	(533)	(554)	(579)	(608)	
Less: Working Capital	87	(104)	(141)	0	195	(29)	(298)	218	(96)	(96)	(96)	(96)	
Equals: UFCF	1,424	1,283	1,389	1,372	1,861	1,840	1,691	2,148	1,881	1,936	2,002	2,077	20,853
Discount Factor							0.98	0.93	0.89	0.85	0.81	0.77	0.77
PV of UFCF							1,652	2,002	1,672	1,642	1,619	1,603	16,095
Enterprise Value							26,285						
Net Debt	6,994	7,741	8,424	8,[illegible]	[illegible]	[illegible]	[illegible]						
Leverage ratio	*2.9x*	*3.3x*	*3.2x*	*3.9x*	*3.1x*	*3.0x*	*3.4x*	*3.2x*					
Operating lease liabilities							2,554						
Minority Interest							1,661						
Equity Value							11,980						
Stock Price Target							$167.55						
% Upside							*31.2%*						

Cost of Debt	5.60%
Risk Free Rate	4.26%
Market Risk Premium	4.33%
Beta	0.54
Cost of Equity	6.6%
Terminal Growth Rate	0.1%
Debt / Total Capital	73.3%
ETR	25.5%
WACC	**4.82%**
TV as % of Ent.Value	61%
Terminal EBITDAx	**6.5x**
Current NTM EBITDAx	8.3x

	2019	2020	2021	2022	2023	2024	2025	2026
NOPAT	1,489	1,432	1,491	1,242	1,490	1,701	1,842	1,762
Invested Capital	15,414	15,050	15,296	14,935	14,768	14,996	15,171	14,326
ROIC	**9.7%**	**9.5%**	**9.7%**	**8.3%**	**10.1%**	**11.3%**	**12.1%**	**12.3%**

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Bears may question DVA's premium over its bigger competitor, FMS (DVA's $11B revenue vs. FMS's $14B). However, I would point out that DVA's revenue growth of 5.6% is higher (vs. FMS's 0.5%) and that DVA's EBITDA margin of 27% is also higher (vs. FMS's 12%). Furthermore, DVA's FCF is more recurring, stable, and predictable as a pure dialysis provider (vs. FMS also builds dialysis machines).

	2024 US Dialysis Revenue	Rev YoY Growth	EBITDA Margin	US Dialysis Rev as % of Total Rev	2024 Leverage Ratio	NTM CFPS	NTM CFPS (5 year average)
DVA	$11,391	5.6%	26.8%	89%	3.0x	5.8x	6.5x
FMS	$13,850	0.5%	12.1%	66%	3.6x	4.9x	6.3x

($ and shares in M, except for RPT & EPS)						Unwavering Capital			Sell-Side	Mgmt		
	FY-20A	FY-21A	FY-22A	FY-23A	FY-24A	Low	Base	High	Base	Low	Base	High
# of US Dialysis Treatments (in K)	30,315	29,622	28,954	28,910	29,046	28,943	29,089	29,234	--	--	29,046	--
% Growth YoY	-2.3%	-2.3%	-2.3%	-0.2%	0.5%	-0.4%	0.1%	0.6%	--	--	0.0%	--
Revenue per treatment	$351.64	$360.07	$366.06	$378.25	$392.13	$410.00	$412.16	$415.00	--	$409.78	$411.74	$413.70
% Growth YoY	0.4%	2.4%	1.7%	3.3%	3.7%	4.6%	5.1%	5.8%	--	4.5%	5.0%	5.5%
Total Revenue	**11,551**	**11,619**	**11,610**	**12,140**	**12,816**	**13,021**	**13,728**	**13,921**	**13,443**	--	--	--
% Growth YoY		0.6%	-0.1%	4.6%	5.6%	1.6%	7.1%	8.6%	4.9%	--	--	--
Patient care costs per treatment	$238.25	$241.45	$253.29	$255.81	$258.13	$276.33	$274.80	$273.04	--	$276.20	$274.91	$273.62
% Growth YoY	-0.5%	1.3%	4.9%	1.0%	0.9%	7.1%	6.5%	5.8%	--	7.0%	6.5%	6.0%
Adj. OI (EBIT)	**1,746**	**1,797**	**1,440**	**1,710**	**1,981**	$1,976	$2,105	$2,309	**2,081**	**2,048**	**2,084**	**2,120**
% Growth YoY	-1.3%	2.9%	-19.9%	18.7%	15.8%	-0.3%	6.3%	16.6%	5.0%	3.4%	5.2%	7.0%
Margin	15.1%	15.5%	12.4%	14.1%	15.5%	15.2%	15.3%	16.6%	15.5%	--	--	--
Leverage Ratio	3.27x	3.24x	3.88x	3.14x	3.01x	3.83x	3.65x	3.40x	--	3.50x	3.25x	3.00x
FCF	1,187	1,132	817	1,236	1,161	$1,648	1,783	$2,000	1,146	1,000	1,125	1,250
CFPS	**$9.92**	**$10.48**	**$8.53**	**$13.26**	**$13.30**	**$22.33**	**$24.16**	**$27.10**	**$20.90**			
% Growth YoY		5.7%	-18.7%	55.6%	0.3%	67.8%	81.6%	103.7%	57.1%			
Forward CFPSx						5.5x	7.0x	8.0x				
Stock Price Target						$122.79	$169.12	$216.76				
% Upside/(Downside)						*-12.6%*	*20.3%*	*54.2%*				
Probability						*30%*	*50%*	*20%*				
Probability-weighted Stock Price Target							*$164.75*					
							17%					
Risk Reward Ratio							1.8x					

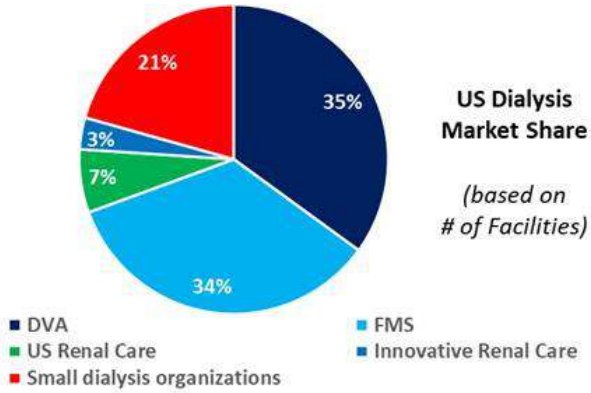
Stock Price as of 4/30/2025	$140.57	Market Cap *(in M)*	$10,810
Diluted shares outstanding (M) as of 4/24/2025	76.9	Total Debt	$9,510
Beta 3Y	0.5	Operating lease liabilities	$2,620
Short interest as % of shares outstanding	5.1%	Minority Interest	$1,445
Forward CFPSx	6.8x	Cash	$557
vs. 5 Year Avg	6.6x	Enterprise Value	$23,828

Summary

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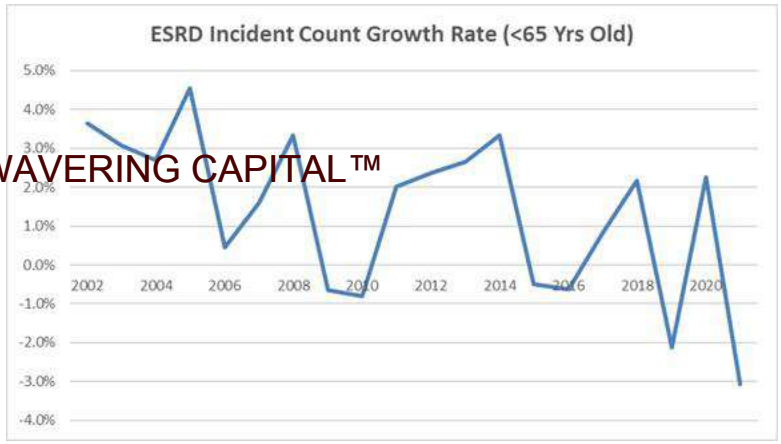
This is a company that I have monitored since 2020 and has generated 51% alpha for me since my initiation report (November 1, 2023) because my contrarian thesis has played out. The fact that DaVita (DVA) generates 89% of its revenue in the US and is providing life-threatening services, DVA is a good safe haven during the tariff-war uncertainties, weakening US dollar, and expected recession. Furthermore, the company has bought 54% of its shares since 2017 and commands 52% ROE and 34% market share in the duopoly dialysis market with a wide moat. With a 17% upside potential and a 1.8x risk-reward ratio, DVA is an ideal investment.

Industry & Company Overview



DVA dominates the duopoly US dialysis market: DVA and Fresenius Medical Care (FMS) have 35% and 34% market shares, respectively (based on the number of dialysis facilities), while the distant third and fourth players, US Renal Care and Innovative Renal Care (used to be known as American Renal Associates) have 7% and 3%, respectively.

DVA and FMS both have great bargaining power with insurance and pharmaceutical companies and 45+ years of valuable patent data. But since FMS has a thinner margin by also having a capital-intensive dialysis machine business and generates more revenue outside the US, DVA is the better vehicle to play the US dialysis market.



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Business segments: While the US dialysis business contributes 89% and 107% of DVA's revenue and EBIT, respectively, the IKC (Integrated Kidney Care) business generates 4% and -2% of DVA's revenue and operating profit. IKC, also known as the value-based care business, is expected to breakeven (operating income) by 2026. International operation constitutes 7% and 3% of DVA's revenue and EBIT. With 509 outpatient dialysis centers located in 13 countries outside of the U.S., the international business will also add to DVA's EBIT as their operating margin will resemble to that of the US operation.

Investment Thesis

1. Although the GLP-1s may be a challenge to mid-term patient volumes with potential slower progression of CKD to ESRD, it will likely be a net tailwind to long-term patient volumes due to reduced mortality associated with the drugs: This has been my contrarian thesis since my DVA initiation report on November 2023, and I'm seeing more clinical trial data and experts validating my argument. For instance, the Swedish Heart

Failure Registry Study conducted in March 2025 found that GLP-1 treatment was associated with a 48% reduction in cardiovascular mortality. FMS's former general manager also said during my primary research on May 3rd, 2025, that "if you look at the data, there's a huge decrease in the mortality of the CKD patients, which could mean yes, there's a slowing of progression, but it could mean a larger bolus of patients eventually making their way to ESRD." The only reason why we haven't seen a noticeable positive impact from GLP-1s yet is because it's a long-term trend and due to a "big hangover effect from COVID, from the huge impact of mortality." I expect 3% annualized patient growth in my base scenario during the next 10 years.

	Bear	Base	Bull
# of years CKD patients progressing from CKD4 to ESRD	12	10	4.2
Efficacy Rate (% Delay in Progression)	*42.0%*	*24%*	*23.0%*
# of years Delayed in Progression from CKD4 to ESRD	5.0	2.4	1.0
The age of CKD4 Patients who fit the delayed window of incident	60-64	62.5-64	64
# of ESRD Incident Patients who're in this age cohort & will choose dilaysis	16,803	--	4,201
DVA's market share as % of US ESRD Patients	*36.0%*	*40.3%*	*40.0%*
# of Incident Patients who'd get DVA dialysis	6,049	22,000	1,680
# of Those who have Commercial Insurance	4,016	2,200	1,004
Those with Commercial Insurance	*23.9%*	*10.0%*	*23.9%*
% of Penetration Rate (Commercial Payors who'll be on GLP-1)	**60.0%**	**30.0%**	**20.0%**
# of Commercial payros who'll be on GLP-1 and DVA loses as patients	**2,410**	**660**	**201**
		0.3%	
# of DVA's Commercial Payors	22,000	22,000	22,000
% Mortality Rate (Commercial payors who die before getting Medicare)	*19.0%*	*15.0%*	*12.0%*
# of Private Payors who live longer due to GLP-1 & continue DVA Dialysis	4,180	3,300	2,640
# of Commercial Payors, net impact of GLP-1, in 2024	**1,770**	**2,640**	**2,439**
Calculated Annual Revenue per Commercial Payor	$ 46,978	$ 46,978	$ 46,978
GLP-1 Impact over 10 years on Commercial Mix			
on Commercial Mix	**8.9%**	**13.2%**	**12.2%**
on Revenue	**$ 832**	**$ 1,240**	**$ 1,146**

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2. The market is overlooking the possibility of DVA acquiring smaller dialysis providers: Fully cognizant of low CMS reimbursement rates and rising cost of labor, the market is penalizing DVA stock for limited margin expansion opportunities. But what they are failing to price in is the tailwind associated with these major headwinds – structural market challenges hurt smaller dialysis organizations (SDOs) more than they do to national operators like DVA, as SDOs have lower operating leverage, lower operational efficiency and inferior cost structure. This dynamic begets an increasing number of SDOs that are struggling to remain profitable, creating acquisition opportunities for DVA. Bears may argue that regulators won't approve DVA's SDO M&As on antitrust measures. But unless the CMS

dramatically increases its Medicare reimbursement rates to cover rising costs or nationalize bankrupt SDOs, the government won't have any other choice but to approve the consolidation. Since SDOs have a 21% US dialysis market share, DVA has a long runway for acquisition growth.

	2022	2023	2024	2025
	FY	FY	FY	FY
# of outpatient facilities				
Beg. U.S. outpatient centers	2,815	2,724	2,675	2,657
Acquired centers	5	–	12	–
Developed centers	39	20	13	13
Net change in non-owned Managed or Administered centers	(1)	3	(7)	–
Sold and Closed Centers (majority of patients not retained)	(22)	(6)	(12)	–
Closed/Consolidated centers (27% patient turnover)	(112)	(66)	(24)	(24)
End U.S. outpatient centers	**2,724**	**2,675**	**2,657**	**2,646**
% Growth	*(3%)*	*(2%)*	*(1%)*	*(0%)*

Key Risks

1. If the flu season persists and the mortality rate remains high, treatment volume growth may be negative: Although the market was expecting excess mortality to wane off post-COVID eventually, the death rate remains stubbornly high. DVA management speculated it could be a longer-than-expected flu season. While it's assuring that the flu activity has recently been decreasing nationwide for several weeks (the weekly hospitalization rate has dropped to 0.5 per 100,000 people, down from a peak of 13.6 per 100,000 earlier in the season), certain areas such as Houston, where DVA has a strong presence in, have reported significant surges in flu cases compared to the previous year. Thus, I have projected 2025 YoY treatment volume growth to be -0.4% in my bear scenario to reflect the probability that the flu season will last longer than anticipated.

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	2022 FY	2023 FY	2024 FY	2025 FY
Total # of patients (domestic and international)	**245,000**	**250,200**	**281,100**	**285,362**
% growth (QoQ for quarters & YoY for annual)	*0.8%*	*2.1%*	*12.4%*	*1.5%*
# of total patients / center	79.7	82.2	88.8	90.1
Total U.S. patients served (# of patients)	**199,400**	**200,800**	**199,449**	**201,625**
% growth - U.S. patient (QoQ)	*(4.2%)*	*0.7%*	*(0.7%)*	*1.1%*
# of US Patients/Center	73.2	75.1	75.1	76.2
# of Patients on Gov. Pmts (75% Medicare/MA; most 65+ yrs old)	**177,801**	**178,800**	**176,911**	**178,407**
Implied Proportion of Total US Patients	*89.2%*	*89.0%*	*88.7%*	*88.5%*
# of Est. Incident Patients who already have Medicare	11,480	10,990	12,507	13,249
# of Est. Patients transferred from Commercial Payor	–	20,430	40,438	42,542
# of Est. Patients who Die	–	(35,760)	(33,613)	(32,113)
# of Est. Patients who receive Transplants	(8,845)	(8,805)	(9,834)	(10,348)
Total # of Est. Gov Payor		(13,145)	9,497	13,330
% of Mortality Rate of Gov Payors		20.0%	19.0%	18.0%
# of Patients on Commercial Insurance (beg)	**21,599**	**22,000**	**22,537**	**23,219**
Implied Proportion of Total US Patients ("Commercial Mix")	*10.8%*	*11.0%*	*11.3%*	*11.5%*
# of Est. Patients who begin dialysis (new Incident/admits)	40,015	45,068	45,752	46,435
# of Est. Patients transferred to Gov Payor (30 month coordination)	–	(39,928)	(40,438)	(42,542)
# of Est. Patients who Die	–	(3,520)	(3,381)	(3,251)
# of Est. Patients who receive Transplants	(1,075)	(1,083)	(1,253)	(1,347)
Total # of Est. Commercial Payor (End)		22,537	23,219	22,515
% of Mortality Rate of Commercial Payors		16.0%	15.0%	14.0%

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2. Wage pressure will continue due to COVID-led labor shortage and higher turnover:

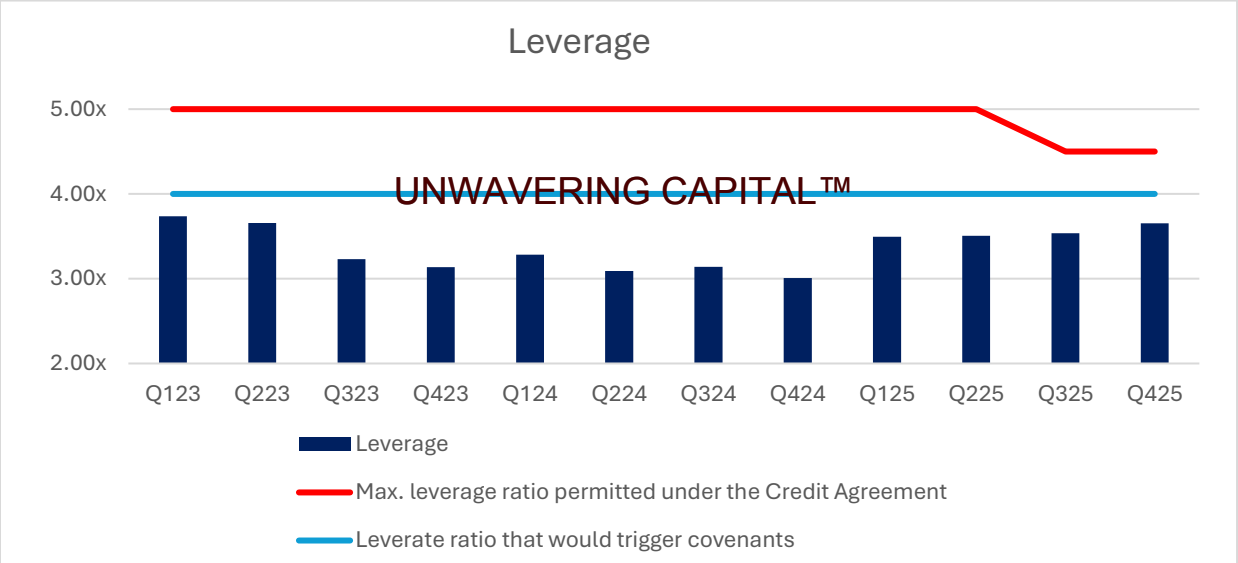
There were a lot of healthcare personnel who left their professions due to burnout during the pandemic, and my expert calls confirm that dialysis providers are "having a very hard time attracting nurses and patient care techs for employment, and thus, they're having to raise their salaries significantly in order to retain their talent." That said, this negative trend has been well-telegraphed by DVA management since COVID – they forecast the YoY growth rate of patient care costs per treatment will be higher than that of revenue per treatment. Thus, I believe the market has fully priced in this risk. In addition, the fact that DVA remains confident with its long-term target for operating growth of 3% to 7% (2025 guidance is 5.2%) with other cost-saving measures (such as

			2025 Patient Care Cost per Treatment		
	2024 Patient Care Cost per Treatment	as % of Patient Care Cost per Treatment	Low	Base	High
Labor (Wage)	$118	46%	$130	$129	$127
Calcimetics	$20	8%	$21	$21	$21
Other pharmaceuticals	$35	14%	$37	$37	$37
Supplies	$28	11%	$29	$29	$29
Business Infrastructure	$57	22%	$59	$59	$59
Total center level	**$258**		$276	$274	$272
% YoY Increase			7.1%	6.5%	5.8%

closing down unprofitable centers) assuages my concern about DVA's structural wage inflation. I've projected 2025 patient care cost per treatment to rise between 5.8% and 7.1% YoY, a wider range than what the management has guided (6% and 7%), to capture a full spectrum of possible scenarios given the highly unpredictable nature of the current inflation rate.

Valuation

DVA should be valued by cash flow per share (CFPS) instead of EPS: First, DVA has reasonably high depreciation and amortization (5% of revenue) from owning and operating dialysis centers, which reduces accounting earnings but doesn't reflect actual cash leaving the business. Secondly, for leveraged companies like DVA (3x debt/EBITDA), cash flow measures are more informative than EPS because interest payments and refinancing risk are cash-based and not reflected fully in EPS.



I applied a 7x forward CFPS multiple in my base scenario to obtain my price target: This is a conservative estimate because it's only a 6% premium vs. its 5-year historical average multiple of 6.6x and 3% premium vs. its current trading multiple of 6.8x. I believe the market will grant DVA this premium in the next year once it generates strong earnings revisions – DVA has many levers to do so, such as the higher-than-expected increased reimbursement for new oral phosphate binders, better visibility into the elevated mortality rate, treatment volume recovery (FMS guides for 0.5% US volume growth in 2025 and expects volumes to recover by 2% in 2026), and lower-than-expected treatment cost etc.

	2025			
($, shares, and treatments in M, except for per share)	**Q1**	**Q2**	**Q3**	**Q4**
Cash available for share repo	676	693	423	618
Repurchased Amount - target	1,200	900	900	900
Repurchased Switch	(676)	(693)	(423)	(618)
Repurchased Price Assumptions	$145.00	$150.00	$155.00	$155.00
Shares Repurchased (in K)	**4,665**	**4,619**	**2,727**	**3,984**
Diluted Shares - Beg	83,804	81,472	79,162	77,799
Issuance / (Buyback)	(4,665)	(4,619)	(2,727)	(3,984)
Diluted Shares - End	**79,139**	**76,853**	**76,435**	**73,814**
Avg Diluted Shares Outstanding	81,472	79,162	77,799	75,806
% Share Count	-2.8%	-2.8%	-1.7%	-2.6%

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Buy $35M of DVA stock and $37K of 4/19/24 P100 for 10%+ return at 2.3x Risk/Reward

KEY METRICS																		
($ and shares in M, except for RPT & EPS)				Downside			Base			Upside			Street			Mgmt.		
	FY-20A	FY-21A	FY-22A	Q423	FY23	FY24	Q423	FY23	FY24	Q423	FY23	FY24	Q423	FY23	FY24	Q423	FY23	FY24
US Dialysis Treatments (in *K*)	30,315	29,622	28,954				7,262	28,917	29,670				7,263	28,951	29,287	6,864	28,520	28,948
Revenue per treatment	$352	$360	$366				$386	$378	$387				$377.07	$374.24	$382.01		$376.13	
Total Revenue	11,551	11,619	11,610	2,971	11,965	12,145	3,127	12,121	12,860	3,440	13,184	14,146	3,008	11,999	12,363			
% Growth YoY		*0.6%*	*-0.1%*	*1.8%*	*3.1%*	*1.5%*	*7.2%*	*4.4%*	*6.1%*	*17.9%*	*13.6%*	*7.3%*	*3.1%*		*3.0%*			
Adj. EBIT	**1,746**	**1,797**	**1,440**	**356**	1,665	**1,652**	**429**	**1,738**	**1,831**	**482**	1,790	**2,122**	**375**	**1,639**	**1,726**	**380**	**1,688**	**1,772**
Margin	*15.1%*	*15.5%*	*12.4%*	*12.0%*	*13.9%*	*13.6%*	*13.7%*	*14.3%*	*14.2%*	*14.0%*	*14.5%*	*15.0%*	*12.5%*	*13.7%*	*14.0%*			
Adj. EBITDA	3,007	3,159	2,905				797	3,206	3,072				562	2,375	2,453			
FCF	**1,187**	**1,132**	**817**				**337**	**1,316**	**1,269**					**1,246**	**1,094**		**1,050**	
Adj. NI				89	629	575	162	702	755	214	754	1,046	157	728	752			
Adj. EPS (diluted)	**$6.46**	**$9.05**	**$5.89**	**$0.96**	**$6.77**	**$6.54**	**$1.76**	**$7.51**	**$8.58**	**$2.37**	**$8.21**	**$12.16**	**$1.68**	**$7.84**	**$8.55**		**$8.05**	
# of Shares Repurchased	28,580	11,702	12,904				4.3	12.5	11.7				0.07	0.83	1.82			
Diluted Weighted Avg. Shares	119,701.6	107,999.8	95,095.5	92.9	93.0	88.0	91.9	93.5	82.2	90.5	91.9	86.0	--	92.92	87.99			
Forward P/Ex					11.5x			13.8x			14.5x			12.6x				
Stock Price Target					$75.20			$118.37			$176.30			$103.89				
% Upside/(Downside)					***-30.1%***			***10.0%***			***63.9%***			***-3.4%***				
Risk Reward Ratio								**2.3x**										

Stock Price as of Dec 10, 2023	$107.58	Market Cap *(in M)*	$9,822	e.g.	
Diluted shares outstanding (M)	91.3	Total Debt	$8,451	stock	$97.00
Days to Cover	3.5	Operating lease liabilities	$3,150	long position (in M)	$31.56
Short interest as % of float	12.9%	Minority Interest	$1,445	$ lost (M)	$3.44
Forward EBITDAx	7.3x	Cash	$557		
Forward P/Ex	12.6x	Enterprise Value	$22,312	Put (M)	$0.02
		4/19/24 P100 Equity Price	$5.40		
Recommended Long DVA position *(M)*	$35.0	Delta	-31.58%	Net Lost (M)	-$3.46
Implied # of Shares to buy	325,339	# of Contracts to buy	69	**Cost drawdown**	**-9.9%**
		Total Put options to buy *(M)*	$0.037		

Summary: With 0.6 beta and 12.6x NTM PE (vs. S&P 500's 20.6x, the healthcare sector's 16.9x, and its 5-year historical average of 12.5x), DaVita is an ideal investment to generate a 10% return with limited downside given its large margin of safety. The price factors in its well-understood idiosyncratic headwinds and the stock is less volatile to expected Fed's interest rate risk. DVA also has a catalyst in 1H24 that addresses investors' concerns around the stock, and a married put would protect us from a max cost drawdown of 10%. Even if a black swan event were to occur, the company's recently upsized and untapped revolver and aggressive share repurchase (4.1% of its market cap every quarter) would further limit the potential investment loss.

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Industry & Company Overview

$38B US Dialysis TAM: At the end of 2021,16M American adults had Chronic Kidney Disease (CKD), a condition in which the kidneys are damaged from diseases like diabetes (44% cause) and high blood pressure, a.k.a. hypertension, (29% cause), and can't filter blood as well as they should. Since people with CKD could lose up to 90% of their kidney function before experiencing any symptoms of the disease, 90% of patients don't know they have the disease. As a result, 809K Americans currently have End-Stage Renal Disease (ESRD), the final stage of CKD. Without dialysis (a procedure to remove waste products from the blood where a patient has to go through 3x a week for 3.5 hours each) or a kidney transplant, the outcome for patients with ESRD is certain death. Because only 3% of prevalent ESRD patients receive transplants and the average weight time for transplant is 4 years, 97% of incident patients receive dialysis.

DVA is a duopoly (36% market share) with scale-derived cost advantages in the fragmented market: Fresenius (FME) has a 38% share of US dialysis, but it has a thin margin and capital-intensive dialysis machine business. The German MedTech also generates 19% of revenue from overseas vs. DVA, which

makes 91% of its revenue in the more profitable US market as a pure dialysis services American provider. Thus, although they have great bargaining power with insurance and pharmaceutical companies and 45+ years of valuable patient data, DVA is a better pick to bet on more predictable US dialysis service revenue.

DVA's 10% of commercial patients generate 33% of its revenue and 96% of EBIT: Those with private insurance before being diagnosed with ESRD must stay on their commercial insurance for 33 months before being eligible for Medicare. Thus, the commercial mix has been consistent, and their higher reimbursements of $800/treatment vs. Medicare's $250 (implied annual reimbursements for commercial and government payors are $47K and $11K, respectively) have been sustainably profitable for DVA. Private insurance companies are still incentivized to pay high rates since they benefit from DVA's strong network of nephrologist referrals and 2,694 outpatient centers. Without DVA, patients would be more likely to end up in emergency rooms, leading to more expensive hospital stays.

Thesis

1. Contrary to the initial headline risk, GLP-1s may be a slight net positive for DVA: When Novo Nordisk (NVO) ended its clinical trial early due to strong efficacy in one or combination of 5 separate endpoints: 1) death from CKD, 2) death from cardiovascular disease, 3) reducing obesity, 4) progression to ESRD, and 5) initiation of dialysis, DVA stock plummeted by 17%. DVA responded by pointing out the following:

1) there may be limited application of the study findings to the overall CKD population given that patients enrolled in the study constitute <10% of all current CKD patients (they had to have Type 2 Diabetes, CKD, a requisite amount of protein in the urine, and have received a standard of CKD care).

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2) GLP-1s have been around since 2005 (NVO's Ozempic injection was approved by the FDA for T2D in 2017 and anti-obesity in 2021) and haven't disrupted the market as the news portrays them to be.

3) ~6% of CKD patients are currently on GLP-1s, and published discontinuation rates is high as 69%.

4) 40% of high-quality clinical studies showed no improvement, 40% showed some improvement, and only 20% had mixed results

5) Ether drugs proven to have similar positive effects, such as SLG2 inhibitors and ARBs and ACE inhibitors. They've been around since 2014 – Eli Lilly (LLY)'s T2D drug, Truclicity – and the 1980s, respectively. Yet, there haven't been headwinds to DVA, and, in fact, the uptake rates of ARBs and ACE inhibitors, even among those who know they're progressing through CKD, have only been ~25%.

6) Currently, 8% of DVA's ESRD population has been on an SLG2, and 65% of those who were prescribed have discontinued.

7) 30% of CKD patients aren't eligible for GLP-1s because they are neither obese, nor diabetes, nor both.
8) If the study confirms prior evidence that GLP-1s reduce cardiovascular mortality, then they will increase the longevity of CKD patients since ~6x more of them die of this heart disease than progress to ESRD, dramatically increasing patients' dialysis treatment period.

9) GLP-1s would reduce the commercial mix by 33 basis points over 10 years, according to DVA's model crafted by its experienced nephrologists and audited by external consultants. The company made 2 key

assumptions (a 30% utilization rate among DVA patients and a 25% efficacy rate in delaying the progression of CKD stage 3/4 to ESRD from 10 years to 12.5 years).

It's difficult to 100% accurately assess these claims and NVO's study because the GLP-1 results are scheduled to be shared in 1H24. However, to quantify what magnitude of the sell-off was warranted, I conducted numerous primary research with independent industry experts, examined 10+ clinical studies, and verified data that DVA used to form their views as much as possible. For instance, my synthesis of numerous data and reports from national organizations like the National Institute of Diabetes and Digestive and Kidney Diseases, American Heart Associations, CDC, and National Kidney Foundation has enabled me to I was able to verify the key data DVA used to formulate its claims #1, 2, 5, 7, and 8. I gave the benefit of the doubt on points #3 and #6, given that they were proprietary data and DVA had the most intensive discussions on the impact of GLP-1 among all the stakeholders' (NVO, LLY, Dexcom – continuous glucose monitor company, FME) earnings calls.

US ESRD Incidents (new case)	2017	2018	2019	2020	2021	2022	2023	2024	2025
0-17 years	950	921	914	905	990	1,020	1,051	1,085	1,121
18-44 years	14,883	15,298	15,848	15,734	15,998	16,478	16,989	17,532	18,111
45-49 years	7,811	7,941	7,947	7,723	7,858	8,094	8,345	8,612	8,896
50-54 years	10,683	10,682	10,692	10,644	10,876	11,202	11,550	11,919	12,312
55-59 years	14,137	13,834	14,286	13,949	14,164	14,589	15,041	15,522	16,035
60-64 years	16,574	16,893	17,299	16,611	17,156	17,671	18,218	18,801	19,422
65-74 years	34,278	35,317	36,734	35,719	37,499	38,624	39,821	41,096	42,452
75+ years	28,993	30,292	31,117	29,434	31,431	32,374	33,378	34,446	35,582
All	128,309	131,178	134,837	130,719	135,972	140,051	144,393	149,013	153,931
% Growth Rate YoY		2.2%	2.8%	-3.1%	4.0%	3.0%	3.1%	3.2%	3.3%
Diabetes	60,810	62,157	63,168	59,823	60,112				
Hypertension	37,451	38,172	38,333	37,431	39,666				
Incident Patients who are Diabetic	47%	47%	47%	46%	44%				
Incident Patients who have Hypertension	29%	29%	28%	29%	29%				
Incident Patients who are D&H	77%	76%	75%	74%	73%				
# of Incident Patients who start Dialysis	124,963	127,594	130,894	126,834	131,819	135,570	139,628	143,798	148,389
Dialysis					96.9%	96.8%	96.7%	96.5%	96.4%
Started with a transplant					3.1%	3.2%	3.3%	3.5%	3.6%

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However, I became skeptical of DVA's points #2, 5, and 6, particularly in its reasoning behind citing previous CKD drugs (ARBS, SLGT2)' adoption and discontinuation rates to predict the efficacy of a relatively new class of drug, GLP-1s. Semaglutide, the active ingredient in Ozempic & Wegovy tested in NVO's study, mimics GLP-1 hormone and the nuance in their chemical formulation differences could be meaningful. For example, Mounjaro (LLY's GLP-1), approved for anti-obesity last month and for T2D in 2022, mimics not only GLP-1 but also GIP (another gut hormone that increases the feeling of fullness). Therefore, the magnitude of new drugs could be greater, and the competition to capture the recently hyped market segment among pharmaceutical companies could open the floodgates of disruptive drugs. In addition, BMJ (peer-reviewed medical journal) suggests GLP=1 as an alternative to SLGT2 for patients with T2D, cardiovascular disease, and CKD.

Furthermore, nephrologists say combining GLP-1s, SLGT2, and ARBs could be more beneficial. Moreover, Ku, Johansen and McCulloch's clinical study indicated that the median time spent in Stages 3B and 4 is 5 years and 4.2 years, respectively, as opposed to 10 years that DVA used to highlight the minimal impact of GLP-1s. Indeed, 9.2 years vs. 10 years isn't a dramatic difference—my critical assessment of management's rebuttal corroborates my conservatism. and search for truth. To sensitize these key inputs, understand the drivers, and further judge DVA's claims, I built my model of the GLP-1 impacts.

First, I shortened both the # of years CKD patients' progress from the late stage (CKD4) to ESRD and the GLP-1 efficacy rate in the bull case. Then, I did the opposite for the base case. I also used 20% and 60%

GLP-1 penetration rates to capture the wider range of commercial payors prescribed the injections, and DVA would lose as incident patients. Then I went further by quantifying the offsetting factor, point #8, that DVA mentioned in the press release but not in the earnings call when they discussed the model:

One of the major headwinds for dialysis services companies is the mortality rates among commercial payors who could've paid high reimbursement rates throughout their 33-month waiting periods before receiving Medicare eligibility. Suppose GLP-1 reduces cardiovascular (hypertension) related deaths, which have been exacerbated due to COVID-19, by increasing the longevity of CKD patients. In that case, the commercial mix will increase by 13%, generating $1.1B incremental profit over 10 years (DVA's 2022 EBIT was $1.4B). This positive impact is also due to the increasing # of ESRD incident patients as significantly more CKD patients are no longer dying a lot before being diagnosed with ESRD due to improvements in cardiovascular, obesity and T2D problems.

	Bear	Base	Bull
# of years CKD patients progressing from CKD4 to ESRD	12	10	4.2
Efficacy Rate (% Delay in Progression)	*42.0%*	*25%*	*23.0%*
# of years Delayed in Progression from CKD4 to ESRD	5.0	2.5	1.0
The age of CKD4 Patients who fit the delayed window of incident	60-64	62.5-64	64
# of ESRD Incident Patients who're in this age cohort & will choose dilaysis	18,143	--	4,536
DVA's market share as % of US ESRD Patients	*36.0%*	*35.6%*	*40.0%*
# of Incident Patients who'd get DVA dialysis	6,532	22,000	1,814
# of Those who have Commercial Insurance	4,336	2,200	1,084
Those with Commercial Insurance	*23.9%*	*10.0%*	*23.9%*
% of Penetration Rate (Commercial Payors who'll be on GLP-1)	60.0%	30.0%	20.0%
# of Commercial payros who'll be on GLP-1 and DVA lose as patients	**2,602**	**660**	**217**
# of DVA's Commercial Payors	22,000	22,000	22,000
% Mortality Rate (Commercial payors who die before getting Medicare)	*19.0%*	*15.0%*	*12.0%*
# of Private Payors who live longer due to GLP-1 & continue DVA Dialysis	4,180	3,300	2,640
# of Commercial Payors, net impact of GLP-1, in 2024	**1,578**	**2,640**	**2,423**
Calculated Annual Revenue per Commercial Payor	$ 46,978	$ 46,978	$ 46,978
Commercial Mix Impact in 2024	0.79%	1.32%	1.21%
Revenue & Adj. EBIT Impact due to GLP-1 *(in M)* in 2024	**$ 74**	**$ 124**	**$ 114**
Margin	*90%*	*93%*	*100%*
Adj. EBIT Impact due to GLP-1 *(in M)* in 2024	**$ 67**	**$ 115**	**$ 114**
GLP-1 Impact over 10 years on Commercial Mix			
on Commercial Mix	7.9%	13.2%	12.1%
on Revenue	**$ 741**	**$ 1,240**	**$ 1,138**

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($, shares, and treatments in M, except for per share)	2017 FY	2018 FY	2019 FY	2020 FY	2021 FY	2022 FY	2023 FY	2024 FY	2025 FY
Total # of patients (domestic and international)	**220,600**	**227,000**	**235,600**	**240,400**	**243,000**	**245,000**	**246,750**	**204,025**	**205,075**
% growth (QoQ for quarters & YoY for annual)	*8.7%*	*2.9%*	*3.8%*	*2.0%*	*1.1%*	*0.8%*	*0.7%*	*(17.3%)*	*0.5%*
Total U.S. patients served (# of patients)	**197,800**	**202,700**	**206,900**	**207,167**	**199,423**	**200,210**	**203,100**	**209,763**	**221,881**
% growth - U.S. patient (QoQ)	*6.1%*	*2.5%*	*2.1%*	*0.1%*	*(3.7%)*	*0.4%*	*1.4%*	*3.3%*	*5.8%*
# of Patients on Gov. Pmts (75% Medicare/MA; most 65+ yrs old)	**178,020**	**182,430**	**186,210**	**186,450**	**179,480**	**180,189**	**181,100**	**187,802**	**201,574**
Implied Proportion of Total US Patients	*90.0%*	*90.0%*	*90.0%*	*90.0%*	*90.0%*	*90.0%*	*89.2%*	*89.5%*	*90.8%*
# of Est. Incident Patients who already have Medicare	11,066	11,531	11,783	11,263	11,751	11,864	12,208	12,365	12,486
# of Est. Patients transfered from Commercial Payor	32,320	33,118	34,832	36,953	37,698	39,662	39,461	41,352	43,246
# of Est. Patients who Die	(30,975)	(32,473)	(37,056)	(46,333)	(39,216)	(40,633)	(34,409)	(28,170)	(30,236)
# of Est. Patients who receive Transplants	(7,895)	(8,396)	(9,181)	(8,851)	(9,561)	(9,910)	(10,558)	(11,775)	(13,969)
Total # of Est. Gov Payor	**182,535**	**186,211**	**186,589**	**179,483**	**180,153**	**181,173**	**187,802**	**201,574**	**213,101**
% of Mortality Rate of Gov Payors	17.4%	17.8%	19.9%	24.9%	21.9%	22.6%	19.0%	15.0%	15.0%
# of Patients on Commercial Insurance	**19,780**	**20,270**	**20,690**	**20,717**	**19,942**	**20,021**	**22,000**	**21,962**	**20,307**
Implied Proportion of Total US Patients	*10.0%*	*10.0%*	*10.0%*	*10.0%*	*10.0%*	*10.0%*	*10.8%*	*10.5%*	*9.2%*
# of Est. Patients who begin dialysis (new Incident/admits)	36,948	36,969	39,885	38,994	40,861	42,826	44,507	47,734	51,217
# of Est. Patients transfered to Gov Payor (33 month coordination)	(32,320)	(33,118)	(34,832)	(36,953)	(37,698)	(39,662)	(39,461)	(41,352)	(43,246)
# of Est. Patients who Died	(3,580)	(2,838)	(4,376)	(2,190)	(2,407)	(481)	(4,268)	(7,160)	(3,046)
# of Est. Patients who receive Transplants	(558)	(594)	(649)	(626)	(676)	(701)	(816)	(876)	(896)
Total # of Est. Commercial Payor (End)	20,269	20,689	20,717	19,943	20,022	22,003	21,962	20,307	24,336
% of Mortality Rate of Commercial Payors	18.1%	14.0%	21.2%	10.6%	12.1%	2.4%	19.4%	15.0%	15.0%
Total # of Patients who Died	**(34,556)**	**(35,310)**	**(41,432)**	**(48,523)**	**(41,674)**	**(41,113)**	**(38,677)**	**(35,330)**	**(33,282)**
% of Mortality Rate	17.5%	17.4%	20.0%	23.4%	20.9%	20.5%	19.0%	16.8%	15.0%
Excess Deaths Post Covid vs. Pre-COVID (2019)							(2,755)		

Even though there are many moving parts, I felt comfortable underwriting this thesis because even if I'm wrong and the GLP-1 turns out to be net negative from the study results release, Phase 4 post-marketing clinical trial takes another 3-12 months after the FDA approval next year. Since most US nephrologists are old/conservative and want to assess the risks (on Dec 2, 2023 EU reported that it's continuing its

investigations from GLP-1 drug makers on reports of side-effects such as suicidal thoughts) before prescribing the injections to its patients, the tangible financial impacts would unfold over long time – certainly not in our investment duration of next 9 months. Moreover, in my primary research with an endocrinologist at NY's small group practice, insurance companies often require patients to try other cheaper medications before covering GLP-1s due to their high costs (LLY's Mounjaro cost $1.1K for a month, and NVO's Wegovy cost $1.3K+). Thus far, the market seems to agree with my thesis (I've made 37.4% fon my investments in DVA, the biggest holding in my portfolio, since I bought them in the lows on November 2, 2023).

2. I'm afraid I have to disagree with Bears' thesis that the industry's shift from outpatient to home dialysis is a headwind: Bloomberg shows that DVA's short interest as % of the float is 12.9%. Although I'd have to call the sell-side to verify the latest #, the amount of short positions on the stock reflects some investors' fears that Berkshire Hathaway's beloved dialysis company's (since 2011, Berkshire has been DVA's largest shareholder with a 40% stake and Ted Weschler, who is cited as a potential heir to Warren Buffet, personally owns 2.4%) advantageous position in outpatient clinics would be impaired with the government's push to better Medicare margin, home dialysis, where there's seemingly low barriers to entry. In 2019, CVS developed a medical device to corner home dialysis, and similar entrance by smaller startups like Strive Health elevated the competition fears.

However, the moat (high operating leverage and high capital barriers to entry that DVA has built over the past few decades) that sustained DVA's 26% EBITDA margin is still intact in-home therapy. While fewer numbers of dialysis facilities will be needed in the future (DVA leases most and therefore minimizes closure costs), its years of proprietary developed cloud health platform, its operation know-how, strong relationships with nephrologists, and network of nurses to educate incident patients for home therapies still bestow DVA with sustainable competitive advantages. DVA and FME also formed a partnership that'd give DVA more access to the German MedTech company's home dialysis machines and supplies, giving them a leg up on what's becoming a more competitive landscape. As a testimony of DVA's durable advantages, it remains the leader in home dialysis as the penetration rate has been 15% (vs. 85% for outpatient). Moreover, CKD care management companies such as Cricket, Somatus, Evergreen, and Monogram initially tried to build their dialysis centers, but they gave up because it wasn't their expertise nor had the financial resources to compete at scale. Thus, they partnered with DVA & FME.

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Risk

1. Medicare's other cost-saving measures pose a threat: CMS pays a fixed and bundled price per dialysis treatment, regardless of modality and incremental services provided. The rate that's updated annually hasn't covered the actual inflationary increase in treatment costs. The government also offers incentives to encourage kidney

	2017	2018	2019	2020	2021	2022	2023	2024	2025
DaVita Facilities	2,510	2,664	2,753	2,816	2,815	2,724	2,654	2,609	2,537
Total US Dialysis patients	504,721	517,960	530,396	525,287	517,105	528,823	536,968	529,333	516,341
Patients transplanted	20,349	21,671	23,773	22,668	25,041				
Living donor	5,724	6,364	6,729	4,985	5,908				
Deceased donor	14,649	15,390	17,157	17,773	19,260				
DVA US Dialysis Patients	197,800	202,700	206,900	207,167	199,423	200,210	203,100	196,912	187,948
% Implied Market Share	39.2%	39.1%	39.0%	39.4%	38.6%	37.9%	37.8%	37.2%	36.4%
Prevalence	736,321	757,945	781,481	806,939	805,629	832,792	857,776	874,931	890,243
Dialysis patient as % of prevalence	*68.5%*	*68.3%*	*67.9%*	*65.1%*	*64.2%*	*63.3%*	*62.6%*	*60.5%*	*58.0%*
% growth	*2.2%*	*2.6%*	*2.4%*	*(1.0%)*	*(1.6%)*				
Transplant as % of dialysis patients	*4.0%*	*4.2%*	*4.5%*	*4.3%*	*4.8%*	*5.0%*	*5.3%*	*5.7%*	*6.3%*
Transplant as % of prevalence	*2.8%*	*2.9%*	*3.0%*	*2.8%*	*3.1%*				

transplants, which have increased by 2% CAGR from 2000 to 2021. Furthermore, it proposed value-based care (VBC) models that provide earlier care to CKD patients. I believe DVA's cost-saving initiatives and goal to increase organic volume by 50bps above the industry trend over the long term while maintaining a 3-7% EBIT margin are feasible as the management has a track record of beating the street's expectation (insiders have 1.1% equity stake).

Valuation

	2017	2018	2019	2020	2021	2022	2023	2024	2025	Terminal
Adj. EBIT	1,616	1,513	1,768	1,746	1,797	1,440	1,738	1,831	2,057	2,098
Less: Taxes	(324)	(258)	(280)	(314)	(307)	(198)	(291)	(356)	(409)	(493)
Add: D&A	453	441	453	517	517	538	561	586	613	625
Less: Capex	(44)	(17)	(11)	(11)	(11)	(12)	(12)	(13)	(13)	(14)
Less: Working Capital	58	(9)	(96)	(96)	(96)	(96)	(96)	(96)	(96)	(98)
Equals: UFCF	**1,759**	**1,670**	**1,835**	**1,843**	**1,901**	**1,673**	**1,900**	**1,952**	**2,152**	**2,119**
Cost of Capital	4.92%	4.92%	4.92%	4.92%	4.92%	4.92%	4.92%	4.92%	4.92%	
Cumulated Cost of Capital	1.00	1.05	1.10	1.15	1.21	1.27	1.33	1.40	1.47	
YE Net Debt		9,776	6,994	7,741	8,424	8,602	8,091	8,091	8,091	
Net Leverage ratio		*5.5x*	*2.9x*	*3.3x*	*3.2x*	*3.9x*	*3.3x*	*3.2x*	*2.9x*	
NOPAT	1,292	1,255	1,489	1,432	1,491	1,242	1,447	1,475	1,648	
Invested Capital	17,270	17,392	15,414	15,050	15,296	14,935	14,062	13,183	12,572	
ROIC	**7.5%**	**7.2%**	**9.7%**	**9.5%**	**9.7%**	**8.3%**	**10.3%**	**11.2%**	**13.1%**	
Unlevered FCF Yield							8.5%	8.7%	9.6%	
Levered FCF Yield							13.1%	13.4%	16.4%	
% Share Reduction to Buybacks		-9.7%	-13.6%	-19.3%	-9.8%	-11.9%	-1.7%	-5.9%	-6.6%	

WACC	
Cost of Debt	4.61%
Risk Free Rate	4.10%
Market Risk Premium	5.70%
Beta	0.61
Cost of Equity	7.6%
Terminal Growth Rate	2.0%
Debt / Total Capital	65.7%
ETR	23.5%
WACC	**4.92%**

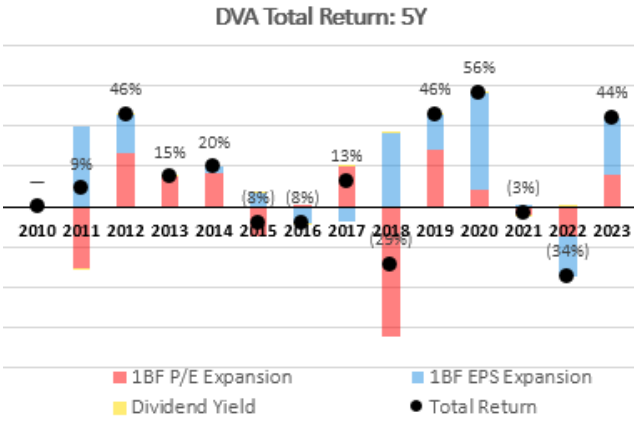
Although DVA, on the surface, looks like a declining business with its revenue growth rate trending around the US GDP growth rate, the levered FCF yield of 13.2% and 10% average annual reduction of share counts since 2018 paints a different picture. To illustrate the delta between my estimates vs. the street and management guidance, I valued DVA on forward PE. I applied a 13.8x on my base scenario because COVID-related excess mortality rate and labor shortage/cost headwinds that have eroded DVA's margins will be subdued. My bear and bull scenarios have been forecasted to capture a wide range of stock price outcomes with NVO's study release.

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KEY METRICS																		
($ and shares in M, except for RPT & EPS)				*Downside*			*Base*			*Upside*			*Street*			*Mgmt.*		
	FY-20A	FY-21A	FY-22A	Q423	FY23	FY24	Q423	FY23	FY24	Q423	FY23	FY24	Q423	FY23	FY24	Q423	FY23	FY24
US Dialysis Treatments (in *K*)	30,315	29,622	28,954				7,262	28,917	29,670				7,263	28,951	29,287	6,864	28,520	28,948
Revenue per treatment	$352	$360	$366				$386	$378	$387				$377.07	$374.24	$382.01		$376.13	
Total Revenue	11,551	11,619	11,610	2,971	11,965	12,145	3,127	12,121	12,860	3,440	13,184	14,146	3,008	11,999	12,363			
% Growth YoY		*0.6%*	*-0.1%*	*1.8%*	*3.1%*	*1.5%*	*7.2%*	*4.4%*	*6.1%*	*17.9%*	*13.6%*	*7.3%*	*3.1%*		*3.0%*			
Adj. EBIT	**1,746**	**1,797**	**1,440**	**356**	1,665	**1,652**	**429**	**1,738**	**1,831**	**482**	1,790	**2,122**	**375**	**1,639**	**1,726**	**380**	**1,688**	**1,772**
Margin	*15.1%*	*15.5%*	*12.4%*	*12.0%*	*13.9%*	*13.6%*	*13.7%*	*14.3%*	*14.2%*	*14.0%*	*14.5%*	*15.0%*	*12.5%*	*13.7%*	*14.0%*			
Adj. EBITDA	3,007	3,159	2,905				797	3,206	3,072				562	2,375	2,453			
FCF	**1,187**	**1,132**	**817**				**337**	**1,316**	**1,269**					**1,246**	**1,094**		**1,050**	
Adj. NI				89	629	575	162	702	755	214	754	1,046	157	728	752			
Adj. EPS (diluted)	**$6.46**	**$9.05**	**$5.89**	**$0.96**	**$6.77**	**$6.54**	**$1.76**	**$7.51**	**$8.58**	**$2.37**	**$8.21**	**$12.16**	**$1.68**	**$7.84**	**$8.55**		**$8.05**	
# of Shares Repurchased	28,580	11,702	12,904				4.3	12.5	11.7				0.07	0.83	1.82			
Diluted Weighted Avg. Shares	119,701.6	107,999.8	95,095.5	92.9	93.0	88.0	91.9	93.5	82.2	90.5	91.9	86.0	--	92.92	87.99			
Forward P/Ex					11.5x			13.8x			14.5x			12.6x				
Stock Price Target					$75.20			$118.37			$176.30			$103.89				
% Upside/(Downside)					***-30.1%***			***10.0%***			***63.9%***			***-3.4%***				
Risk Reward Ratio								**2.3x**										

Catalysts & Execution

Married put strategy, specifically sizing DVA's long recommendation by $35M with $37K put options (April 19, 2024), reflects my strong conviction around the name and desire to hedge against potential losses and uncertainty. With -31.6% delta, an option price of $5.40, and a strike price of $100, I recommend buying 69 contracts to enable the maximum cost drawdown below 10%. NVO's GLP-1 study result release will catalyze to unlock further DVA's intrinsic value and the constant news around GLP-1 efficacy and adoption rates will provide goalposts for us to size our positions accordingly.



Key Events

May 9, 2023 (stock pops +12.9%)**:** DVA announces Q123

July 10, 2023 (stock still falls -0.2%): GLP-1s under EU investigation over 2 cases of suicidal thoughts involving Saxenda, Ozempic and Wegovy and 170 cases reports from a system to register suspected adverse reactions to medicines

- NVO "GLP-1 has been used to treat T2 diabetes for 15+ years and obesity for 8 years, including semaglutide and liraglutide that have been in the UK since 2018 and 2009, respectively. It has treated 20M+ patients."

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July 26, 2023 (stock still falls by -1.7%): UK also joins the EU investigation.

Aug 8, 2023 (stock drops gradually by -11% from an all-time high of $112 to $100 over 8 days after this announcement): NVO demonstrates that GLP-1 (weight loss medication, Wegovy) reduces cardiovascular mortality for obese adults who don't have diabetes and previous cardiovascular disease in Phase 3 SELECT trial

- While there have been many weight-loss drugs for T2 diabetes and obesity, the 1st promising drug that could reduce cardiovascular events in obesity patients without diabetes
- Cleveland Clinic, the hospital that the physician whom NVO paid to conduct the SELECT trial is associated with, states that
    - while "Semaglutide wasn't associated with higher risks for severe gastrointestinal disorders, pancreatitis, psychiatric disorders or kidney injury, one limitation of the trial is that only patients with pre-existing cardiovascular disease were included. The effects of semaglutide on primary prevention of cardiovascular events in obese people who don't have previous cardiovascular disease weren't studied"

Sep 22, 2023 (stock falls by -3.6% to $98 the next day): FDA approves LLY's Jardiance (SLG2) to reduce the risk of sustained decline in eGFR, ESRD, cardiovascular death, and hospitalization in adults (without necessarily having T2 diabetes or heart failure) with CKD at risk of progression.

Oct 10, 2023 (stock plummets by -17% to $76 the following day): NVO ends its Phase 3 FLOW trial early due to strong efficacy signs (sought to demonstrate that Ozempic delays the progression of CKD and lowers the risk of kidney and cardiovascular mortality)

- NVO trades 11% higher in pre-market
- NVO will use these results for label expansions in the US and EU this year

Oct 12, 2023 (stock still drops by -0.8% to $74 the following day) DVA & FMS each release a statement saying that GLP-1s would have a net effect on how many patients would require the company's dialysis services.

- While past trials from 2014 have shown that GLP-1 drugs could slow the progression of CKD

Nov 6, 2023 (stock falls by -0.6% to $79 on the announcement) CMS announces that the CY2023 ESRD PPS base rate of $265.57 will increase only by 2.1% to $271.02 in CY2024.

- Despite CMS acknowledging that the 2022 forecast error was larger than originally calculated, the net rate update was still below what DVA felt was appropriate, given continued forecasting errors, current inflation and other rising costs

Nov 8, 2023 (stock shoots up by +5.9% to $85) – DVA releases 3Q23 earnings, and FDA approves LLY's Zepbound for anti-obesity injection based on currently available clinical data and scientific evidence.

Dec 2, 2023 (stock jumps by +1.9% to $106 the next trading day) – EU seeks more data from GLP-1 drugmakers on suicidal thoughts

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- MediCovers a range of GLP-1 receptor agonists, including NVO's Ozempic, Wegovy, Rybelsus and Saxenda, LLY's Trulicity, Sanofi's Suliqua, AstraZeneca's Bydureon
- It's not targeting Mounjaro because it belongs to a different molecule class

Other Notable

Ownership

- Berkshire Hathaway – 39.5%
    - Ted Weschler, current PM @ Berkshire Hathaway and who is cited as a potential future CIO, personally owns 2.4%
        - None of them sold shares
- 1.1% Insider share
- Insider Activity

- COO of DVA Kidney Care buying recently, indicating that he thinks the stock is undervalued



Glossary & Acronyms

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Affordable Care Act (Obamacare): aims to reduce the amount of uncompensated care the average American pays for by requiring everyone to have health insurance

Anigotensin-Converting Enzyme (ACE) inhibitors: medicines that relax the veins to lower blood pressure. They show promise in protecting the kidneys.

- **Angiotensin Receptor Blocker (ARB)** have similar effects

Cardiovascular disease: conditions that affect heart and blood vessels that can lead to heart attacks. One of the leading risk factors is diabetes.

Charitable Premium Assistance: allows patients to finance the continuity of healthcare insurance coverage that they've had for years while they're unable to work full-time

Chronic Kidney Disease (CKD): kidneys are damaged and can't filter blood as well as they should. Patients also are at high risk of cardiovascular disease, including heart disease and stroke. The 2 leading causes are diabetes and high blood pressure (hypertension)

COBRA: insurance that gives employees to temporarily continue health insurance after leaving their firms

Comorbid: medical conditions that are present in a patient

Crash: when the patient has received minimal or no nephrology care before starting dialysis

- 20% of 2021 incident patients have received no pre-ESRD nephrology care

- 79% of 2021 incident patients have received no pre-ESRD kidney dietician care

Endocrinologist: specialists who treat people with conditions caused by problems with hormones such as diabetes, thyroid problems

End-stage renal disease (ESRD) (a.k.a. ESKD, kidney failure): last stage of CKD when your kidneys no longer work. This is when kidney function is below 15%.

ESRD Seamless Care Organizations (ESCO): To improve the quality of care for people with ESRD and to cut CMS spending on that care in the process, ESCOs were launched in Oct 2015 (ended in 2021) consisting of dialysis centers, nephrologists, and other providers to provide primary care.

- Over 5 years, the Medicare beneficiaries in the ESCOs showed
    - Modest improvement in patient survival
    - Reduced Medicare spending by $88 per beneficiary per month
        - Cost savings don't include the shared savings payments CMS made to the ESCOs for meeting quality and financial benchmarks
            - After the 4th year, the shared savings payments to the ESCOs swung a $151M reduction in Medicare spending to a $46M increase in spending (aggregate net losses)
    - 5% fewer hospitalizations
    - Take drugs that offset kidney damage
    - $93,191/yr for hemodialysis patients and $78,741/yr for peritoneal dialysis patients
- CMS launched a new kidney care programs
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    - **Kidney Care Choices (KCC),** a voluntary model that builds on some elements of the ESCOs, starting in 2022
        - It's a broader program and includes CKD 4, ESRD and includes 2 versions
            - **Kidney Care First (KCF):** specific for nephrologists
            - **Comprehensive Kidney Care Contracting:** targeted towards nephrologists, transplant centers, dialysis facilities, and other entities, which consists of shared savings/losses for the total cost and quality of care for attributed patients
    - **ESRD Treatment Choices (ETC):** a 7-year mandatory model that started in Jan 2021
        - Pay-for-performance program based on nephrologist and dialysis facility-level home dialysis, transplant waitlisting, and living donation rates

ESRD Prospective Payment System (PPS): single bundled payment rate to encompass all goods/services provided during the dialysis treatment, including pharmaceuticals and most lab services.

- Absent action by Congress, it's automatically updated annually by a formulaic inflation adj., but it doesn't always cover the actual inflationary increase

Estimated glomerular filtration rate (eGFR): a measure of how well kidneys are working based on a blood test and one's age, sex, and body type

Fee-for-Service: payment model where services are unbundled and paid for separately that has been criticized for incentivizing physicians to focus on quantity of care, rather than quality of care.

Glucagon-like peptide-1 (GLP-1): receptors of hormones selected from the intestine that reduce appetite, increase the feeling of fullness and lower blood sugar levels.

- Many use the weekly injections off-label to lose weight.
- A study showed that 52% of the obesity users had T2 diabetes.

Glucose-dependent insulinotropic polypeptide (GIP): another hormone in the gut that increases the feeling of fullness like GLP-1

Incidence: # of individuals who develop the disease vs. **Prevalence,** which looks at the number of new and existing individuals who have the disease

Medicare Advantage (MA): private managed care version of Medicare. In 2021, ESRD enrollees may roll in MA as Congress passed the 21st Century Cures Act on Dec 7, 2016. Currently, MA coverage is limited to those with insurance with an MA plan before diagnosis with ESRD. Additionally, CMS will have to risk adjust the MA plans payment for CKD as a disease like other comorbid conditions.

Medigap: extra health insurance that one buys from a private company to pay health care costs not covered by Medicare

Off-label: prescribing a drug for a different purpose than what the FDA approved.

Ozempic: NVO's Type 2 antidiabetic (approved by the FDA on Dec 5, 2017) and anti-obesity (approved on June 4, 2021) that mimics GLP-1

- Sued in Aug 2023, along with Mounjaro, for "downplaying the severity of the gastrointestinal events caused by them" after she was hospitalized for stomach issues, including being sent to the emergency room and losing teeth for excessive vomiting

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Prospective Payment System (PPS): a method of reimbursement in which Medicare payment is made based on a predetermined, fixed amount based on the service type.

Saxenda (a.k.a. Liraglutide, Victoza): NVO's 1st-generation antidiabetic drug (approved on Dec 23, 2014, for adults and on April 4, 2020, for adolescents aged 12+). It has limited availability through the end of 2023 because of surging demand.

- There's an FDA warning on the prescribing info about the risk of thyroid c-cell tumors and suicidal thoughts
    - There was 1 suicide in the trial in the Saxenda treatment group

Semaglutide: Active ingredient in Ozempic & Wegovy that mimics GLP-1 hormone to activate the receptor and induce insulin secretion from the pancreas, promoting weight loss, improving blood glucose control, decreasing cardiovascular risk, decrease in blood pressure, reductions in inflammation, and beneficial effects on heart muscle and blood vessels

Sodium-Glucose cotransporter-2 (SGL2) inhibitor: oral drugs that lower blood sugar levels by preventing kidneys from reabsorbing sugar that's created by the body and the extra sugar leaves through via urine

- Effective at slowing the progression of CKD, reducing heart failure, and lowering the risk of kidney failure and death in people with CKD and T2 diabetes. SLG2 also protects the kidneys in people with CKD who don't have diabetes
- Boehringer Ingelheim and LLY's **Empagliflozin (brand name: Jardiance)** received FDA approval for adults with CKD and without necessarily having T2 diabetes or heart failure (Sep 22, 2023)
- Canaglifozin, dapaglifozin (a.ka. Forxiga, approved by FDA in Jan 2014), and ertuglifozin are FDA-approved for T2 diabetes
- Known to be superior to GLP-1 in improving cardiovascular and renal outcomes
- But for patients with T2 diabetes, cardiovascular disease, and CKD, BMJ Group suggests GLP-1 as an alternative to SGL2

Tirzepatide: active ingredient in Zepbound. 1st safety study was conducted in 2016 and showed 12-13% weight loss.

Truliciy (a.k.a. Dulgalutide): LLY's T2 antidiabetic (approved on Sep 18, 2014)

Type 2 Diabetes: 30M+ Americans have this chronic (persisting for a long time) and progressive condition in which the body doesn't make/use insulin normally, leading to high levels of glucose in the blood.

Wegovy: NVO's anti-obesity injection (approved on June 4, 2021) that mimics GLP-1. Was FDA-approved in 2021 for adults with obesity and at least 1 weight-related condition (high blood pressure, T2 diabetes or high cholesterol)

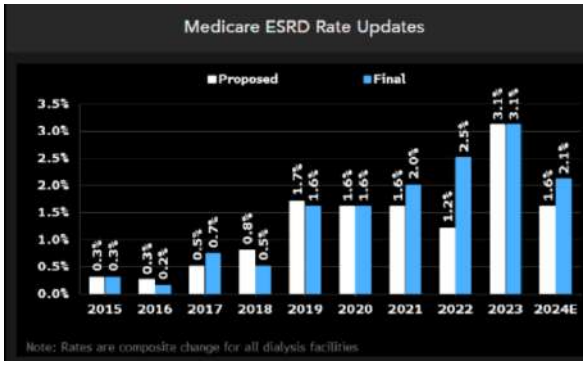
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Zepbound (a.ka. **Mounjaro, Tirzepatide**): LLY's FDA-approved anti-obesity (Nov 8, 2023) and T2 antidiabetic (May 13, 2022) injection for those with at least one weight-related condition (e.g., high blood pressure, T2 diabetes, high cholesterol, BMI of 30+).

- Unlike Ozempic & Wegovy that only mimic GLP-1, it also mimics GIP
- Not for use in T1 diabetic
- Side effects: nausea, diarrhea, vomiting, constipation, stomach discomfort/pain, fatigue, hair loss
- Causes thyroid C-cell tumors in rats (unknown yet for humans)
- Cost <20% less than Wegovy for those with insurance coverage
- Expected to be on the US shelf by Nov 2023
- The change in marketing authorization is yet to be granted by the European Commission, but LLY said it will be on the UK shelves "sooner rather than later."

Other

80% of ESRD patients receive Outpatient Hemodialysis (OH), Although only a few chose home hemodialysis (HD) vs. OH due to frequent needle sticks (sessions are 2.5-3 hours for 5-6x a week) and the need for having a partner, COVID exacerbated the HD penetration rate to 15%.



The cost of dialysis is 1% of the entire federal budget. ESRD is the only disease that enables an incident patient to qualify for Medicare even if they are below 65 (the usual threshold age). Due to the structurally increasing number of obesity (70% of 186M American adults), hypertension (46% of American adults), and diabetes (14%), the prevalence of ESRD patients has been increasing at 3% YoY. To reduce burdensome expenditure, the Centers for Medicare & Medicaid Services (CMS) is moving from a fee-for service model to a single bundled payment rate per dialysis treatment. It's updated annually but doesn't always cover the actual inflationary increase. Also, Medicare only covers 80% of the population, and 20% must be co-paid or covered by their secondary insurance (e.g., private Medicaid for low-income people).

US ESRD Prevalence (All Cases)

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
0-17	5,975	6,079	6,140	6,139	6,164	6,274				
18-44	110,611	111,418	113,035	115,191	116,052	116,722				
45-49	57,131	58,573	59,387	59,787	58,163	56,657				
50-54	73,839	74,635	75,603	76,599	77,048	77,408				
55-59	90,203	91,605	[illegible]	[illegible]	[illegible]	[illegible]				
60-64	99,972	103,242	106,436	109,252	108,505	107,748				
65-74	178,197	186,588	195,010	205,140	207,049	208,292				
75+	120,393	125,805	132,429	139,054	137,645	141,076				
All	**736,321**	**757,945**	**781,481**	**806,939**	**805,629**	**808,536**	**832,792**	**857,776**	**874,931**	**890,243**
Growth		2.9%	3.1%	3.3%	-0.2%	0.4%	3.0%	3.0%	2.0%	1.8%
Diabetes	285,491	295,001	304,420	314,287	308,344	304,018				
Hypertension	190,023	197,390	205,403	212,992	213,617	215,800				
as % of all ESRD										
Diabetes	38.8%	38.9%	39.0%	38.9%	38.3%	37.6%				
Hypertension	25.8%	26.0%	26.3%	26.4%	26.5%	26.7%				

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Buy DVA

Buy					
Price	$57.87	Consensus (12M PT)	$69.00	Commercial Mix (below range)	-10bps
Price Target	$69.68	Buys	8 (61.5%)	Non-acquired growth (low end	2.6%
Expected Share Price Return	20.4%	Holds	5 (38.5%)	Cost growth (high end)	1.5%
Expected dividend yield	0.0%	Sells	0		
Expected Total Return	**20.4%**				
Market Cap	$9.6B	Trailing P/E	16.4x		
52 Week Range	$48.25 - $79.11	GP Margin ('18)	29.6%	EV / EBITDA (unadjusted - '19	10.1x
3-Mth Avg Trading Volume	1.9M	OI Margin ('18)	13.4%	EV / EBITDA (adjusted - '19)	6.9x
Short Interest / % of float	3.9M / 3.2%	Debt / EBITDA (LTM)	4.5x	EV / Sales ('19)	1.3x
Forward P/E	12.7x			EV/EBIT ('19)	13.8x

Recommendation

DaVita, a leader in the ~$28B US dialysis services market (with 37% market share vs. a fellow duopoly player, Fresenius' 35%) with predictable growth potential, is a good long-term story. There may be price risk and relative market movement should regulatory event occurs, but they shouldn't impact the overall long-term thesis.

Catalysts are 1) significant shareholder returns with impending DMG sales (pg 7-8), 2) stabilizing reimbursement and commercial mix trends (pg 9), 3) margin expansion due to limited cost growth (pg 10)

Investment risks are 1) ballots similar to Prop 8 and SB 1156 (AB-290) seeking to cut commercial rates (pg 11), 2) SB-349 that would impose minimum staffing ratio (pg 12), and 3) potential structural payer mix challenges (pg 13).

Executive Summary

- **Company (pg 2):**
  - Stable recurring business, high commercial reliance, relatively low CapEx requirements
- **Competitive advantage (pg 4):**
  - Leading market share indicates a sustainable physician network and provides leverage on price negotiation with private insurers
- **Industry landscape (pg 5):**
  - ESRD / dialysis patients are expected to grow (4% and 5% CAGR respectively) in the foreseeable future, driven by an aging population and higher ESRD occurrence rate led by diabetes and hypertension; partially offset exposure to reimbursement risk
- **Consolidation potential (pg 6):**
  - Despite limited M&A opportunities, consolidation could still happen, representing some growth potential
- **Valuation summary (pg 14):**
  - Multiples was the primary valuation method (terminal value DCF analysis conducted just as a benchmark)
  - Currently valued at a discount to peers (DVA's 7x EV/EBITDA (19E), ~30% discount to multiples of FMS and ARA); multiple compression may be lifted if regulatory risks are discharged and DMG transaction closes, repurchasing shares as much as expected

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Consensus Overview		4Q18		2019 Guidance	
		Actual	Estimate	Low	High
EPS, adj	**Met** (beat 4 of 8)	$0.90	$0.90		
EPS GAAP	**Beat** (beat 5 of 8)	$0.96	$0.44		
Sales	**Missed** (beat 5 of 8)	$2,821	$2,939		
Net Income, Adj+	**Beat** (beat 4 of 8)	$149	$149		
Operating Income	**Beat** (beat 4 of 8)	$388	$360	$1,540	$1,640
EBITDA	**Beat** (missed 5 of 8)	$525	$509		
Operating CF		$307		$1,375	$1,575
FCF		$112			
Effective Tax Rate		24.3%		28.5%	29.5%

	Down	Base	Upside
2019 adj. EBITDA	$1,865	$2,523	$2,743
(x) Adj. EBITDA multiple	9.0x	7.5x	9.0x
Implied EV	**$16,784**	**$18,923**	**$24,683**
Net Debt	$9,726	$9,726	$9,726
Implied EqtV	**$7,058**	**$9,197**	**$14,957**
(/) FDS	167	132	132
Implied share price	**$36.4**	**$69.7**	**$113.3**
% to current	*-37.2%*	*20.4%*	*95.8%*
DCF value	**$21.6**	**$65.6**	**$85.6**
% to current	*(62.2%)*	*15.0%*	*50.0%*

Company Overview

Stable recurring business, high commercial reliance, relatively low investment requirements

- **Leading provider of dialysis services to patients with chronic kidney failure and end stage renal disease**
  - 2,910 facilities[1] and 29.4M treatments,[1] US-focused (89% of sales)[1] dialysis provider
  - Other ancillary revenue consists of pharmacy services and vascular access (7% of sales) (1)
  - Operates 242 outpatient dialysis centers located in 10 countries outside the US (4% of sales)[1]
- **Colorado-based company grows faster than the industry does**
  - 2000 to 2016 Industry CAGR of 3.8% vs. 2011 to 2016 DVA CAGR of 5.7%
- **Berkshire owned (23%) firm suspended patient assistance for Charitable Premium Assistance (CPA) from the American Kidney Fund (AKF) in 2016 due to intense political and social scrutiny**
  - Payor mix, DVA's biggest profitability driver, deteriorated significantly in 2017 vs. 2016, with a 300bps mix shift from higher reimbursing commercially insured patients to lower-reimbursing Medicare and Medicaid patients
  - ~230M decline in EBIT in 2017
- **A judge issued an injunction in early 2017 to block the Centers for Medicare and Medicaid Services (CMS) proposal that would severely constrain the use of AKF premium assistance**
  - Although a temporary relief for the dialysis industry, the issue could resurface at any time
  - That said, DVA, along with competitors, have significantly reduced the # of patients who used to have Affordable Care Act (ACA) commercial coverage with Medicaid as secondary
  - Thus, the risk of suffering another significant hit to profitability has lessened

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JPM Healthcare Conference (Jan 7, 2019) - FY19 EBIT at $1.54-$1.6B vs. consensus of $1.62B

- # of treatments at3 - 4%, with non-acquired growth at 2.5 – 3.5%
  - Revenues per treatment (RPT) are at 0-1%, cost per treatment (CPT) +0.5 – 1.5%, and CapEx of $800 - $840M
- Commercial RPT: (1)%- 0.5% (rate increases for large majority, offset by decline in OON and outliers)
- Government RPT: 1-2% (Medicare FFS rate increase of 1.2% and continued shift to higher rate MA)[2]
- Expense 0.5-1.5% (excludes impact of calcimimetics and cost to defeat Prop 8 in 2018, or other potential ballot initiatives)
- Expectations are low for DVA and the short interest has been decreasing with the recent price moves

Q3 2018 (Nov 7) – Reported adj. EPS of $0.56, 37% below consensus as a couple 1x items weighted on earnings

- G&A cost increased significantly due to $45M in advocacy spend, a $32M QoQ increase (dialysis and lab segment G&A)
- Although difficult to forecast, an increase in mgmt.'s baseline spent of $30M per year on general advocacy, plus whatever incremental spend is necessary to counter various initiatives
- $23M for a change in the company's executive retirement policy (corporate G&A)
- Slight decline in commercial mix and a small shift toward lower paying plans

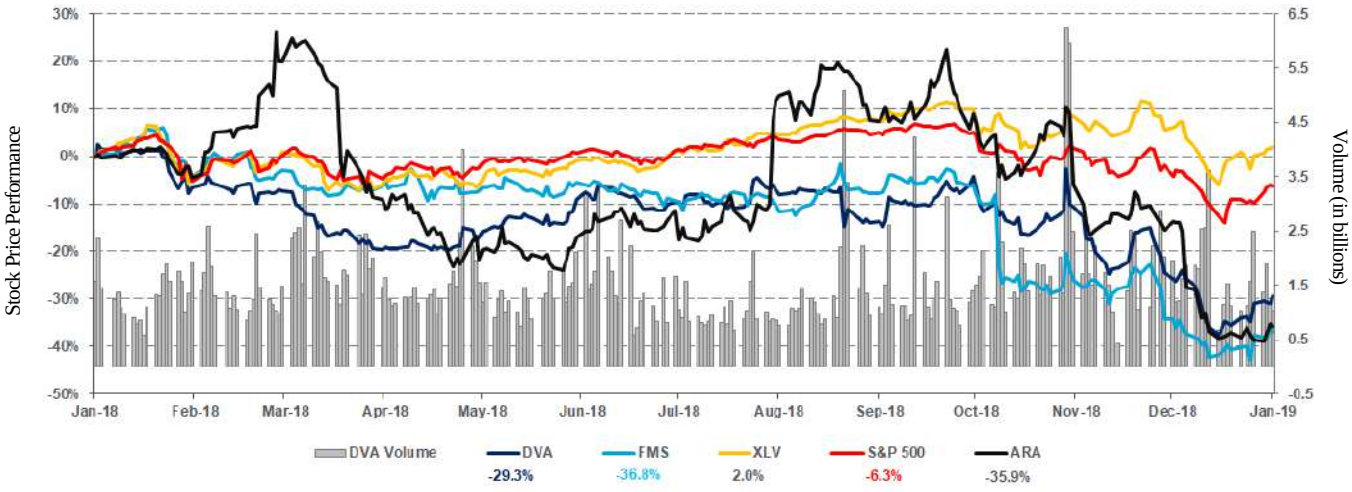
Source: Company Presentation at JPM Health care Conference on Jan 7, 2019

(1) as of Dec 30, 2018

(2) Medicare Advantage is the private managed care version of Medicare. Beginning in 2021, enrollees with ESRD may roll in MA plans as Congress passed the 21st Century Cures Act on December 7, 2016. Currently, MA coverage is limited to those that had insurance with a MA plan prior to diagnosis with ESRD. The law will carve-out kidney transplants for MA plans and will be reimbursed under Part A/B benefits. Additionally, CMS will have to rsik adjust the MA plans payment for CKD as a disease like other comorbid conditions.

Company Overview (Cont'd)

DVA stock price has performed relatively well compared to its competitors in the dialysis space



DVA has recently dodged bullets but expect increase in advocacy costs as union backed initiatives won't stop

- **California's Proposition 8 defeated that would've led up to ~$310M losses, stocks jumped 10% (Nov 7, 2018)**
  - Would've limited the revenue dialysis providers could earn through rates from privately insured patients to 115% of the costs to provide the care (excluding managerial clinics staff) and healthcare improvement costs (staff training and patient education)
  - Clinics that don't issue refund within 210 months after FYE would've be fined for 5% of total required refund, but not to exceed 100K
  - DVA could've had to shutter 292 California clinics (11% of DVA's and 50% of California's), discontinuing service for ~70,000 dialysis patients in the state
  - DVA spent $66.6M of $110M used by the industry lobbying against the measure
  - SEIU-UHW, a California union with a membership of ~150k, will continue to cause DVA to spend considerable resource opposing these types of initiatives over the next years
  - Similar to Prop 61, which targeted high drug prices and failed in 2016 (such initiative have a hard time because voters deem the topic too complex and/or not as pertinent to their lives)

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- **C.A. SB 1156 Veto: would've led up to EBITDA losses of ~$150M (Oct 1, 2018)**
  - Would've prevent (1) DVA from billing private insurance companies receiving CPA[1] premium payments at rates that are higher than Medicare rates by steering patients who qualify for Medicare or Medi-Cal toward private health insurance coverage instead, or (2) giving private insurance companies opportunities to deny coverage for CPA supported ESRD patients
  - Of 3,867 beneficiaries of the AKF's CPA in California, 45% had Medicare, Medigap,[2] or MA (negligible economic benefit), 35% were on employer paid plans (~$12M loss), including COBRA[3] (~$81M loss), and 20% were on private commercial coverage, ACA[4] plans (~$54M loss)
  - Although California assembly and senate voted to pass the bill, Gov. Jerry Brown vetoed citing concerns it would cause insurers to refuse CPA and choose which patients to cover

Source: Company filings, market data, information provided to the California legislature by the American Kidney Fund (AKF)

(1) Charitable Premium Assistance allows patients to finance continuity of health insurance coverage that they have had for years while they're unable to work full-time

(2) Medigap is extra health insurance that one buys from a private company to pay health care costs not covered by Medicare

(3) COBRA, an insurance program that gives employees the ability to temporarily continue health insurance coverage after leaving

(4) Affordable Care Act, a.k.a. Obamacare, aims to reduce the amount of uncompensated care the average American pays for by requiring everyone to have health insurance

Competitive advantage

DaVita's key competitive advantage is its size and consistently high performance quality

- Dialysis companies rely on referral from physician network; in absence of other idiosyncratic factors, high local market share indicates good existing physician network and is a key catalyst for physicians' future decisions, forming a positive self-reinforcing cycle
  - As of July 2018, out of 1,900 counties included in the dataset, DaVita controls the majority of the market (>50% facility share) in 708 counties (~37% of total)
  - Fresenius is the near-exclusive provider (>75% of facility share) in a greater number of counties, but lags behind DaVita in national facility shares (~35% vs. ~37%)

Facility market share - county level

	Davita		Fresenius	
	Number	% of total	Number	% of total
Total number of counties	1,900	100%	1,900	100%
# of counties - facility share is larger than 75%	378	20%	454	24%
# of counties - facility share is larger than 50%	330	17%	321	17%
# of counties - facility share is larger than 25%	214	11%	209	11%
# of counties - facility share is smaller than 25%	980	52%	916	48%
Total number of facilities nationally	2,647		2,474	
% facility market share	*36.9%*		*34.5%*	

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- In addition to their high local market shares, DaVita and Fresenius deliver better performance than their peers
  - DaVita's QIP performance score is significantly better than that of independent providers and smaller clinics ("all other" category) and the higher performance score translates into a larger percentage (~90%) of facilities with no reduction in Medicare reimbursement
  - Some smaller providers (such as American Renal Associates and Satellite Healthcare) are able to match DaVita on the QIP metrics; however the fact that DaVita operates on a much larger scale (12x and 39x in total number of facilities than ARA and SH) indicates its capability of national-scale operations and quality control

			Facility payment reduction distribution				
Provider	**QIP performance score**	**Total facility counts**	**No Reduction**	**0.5%**	**1.0%**	**1.5%**	**2.0%**
FRESENIUS MEDICAL CARE	62.6	2,197	88%	10%	2%	0%	0%
DAVITA	63.6	2,289	90%	8%	1%	0%	0%
INDEPENDENT	53.4	735	67%	15%	10%	5%	2%
DIALYSIS CLINIC, INC.	61.5	209	83%	13%	4%	–	–
AMERICAN RENAL ASSOCIATES	62.7	184	89%	10%	1%	–	–
US RENAL CARE, INC.	62.1	186	88%	9%	2%	1%	–
SATELLITE HEALTHCARE	66.9	59	98%	2%	–	–	–
All others	58.9	388	82%	12%	5%	1%	0%
Industry average	59.2	6,247	86%	10%	3%	1%	0%

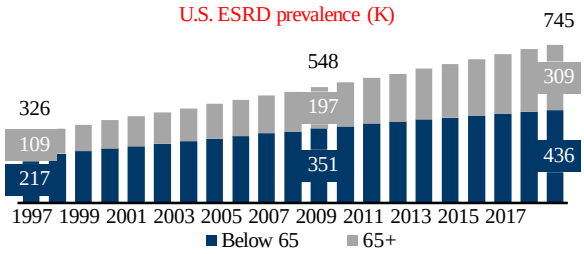
- Other than maintaining the physician network, high local market share also helps DaVita and Fresenius to negotiate package and pricing with private insurance providers, as these 2 companies effectively controls majority of the market in ~80% of the counties

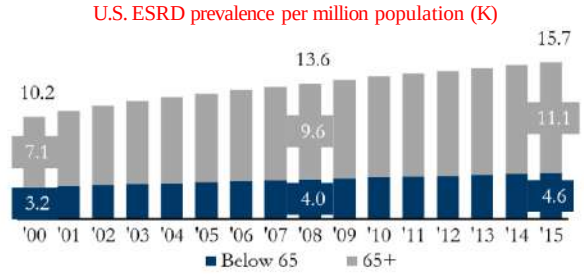
Source: USRDS, CMS, company filings.

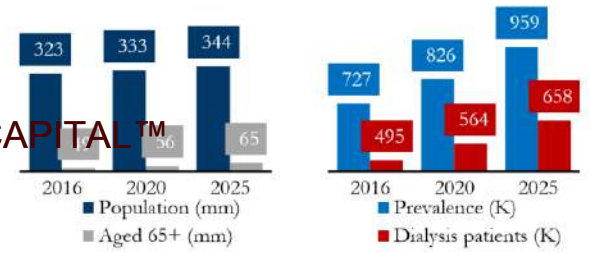
Industry overview

Consistent growth in U.S. ESRD and dialysis population expected to continue

- ESRD[(1)] prevalence in the U.S. showed consistent historical growth since 1996 with CAGR of ~4%, with total prevalence reaching ~750K in 2017
  - For people aged 65+, 20Y CAGR reached ~5 %
  - Prevalence per million population increased from ~10K in 2000, to ~16K in 2015, a ~3% CAGR
  - In the coming 10 years, population aged 65+ will become the fastest growing age group in the U.S., fueling growth for ESRD
- Dialysis patients population have increased at a similar rate, reaching ~500K in 2016
  - Kidney transplant growth has fell behind dialysis growth due to limited availability; total # of patients receiving transplants as % of dialysis patients has dropped from ~6% in 1996 to ~4% in 2013
- Based on population forecast and prevalence per million population, total dialysis patients is expected to reach ~500K by 2020, and ~640K by 2025, representing ~3% CAGR in the foreseeable future



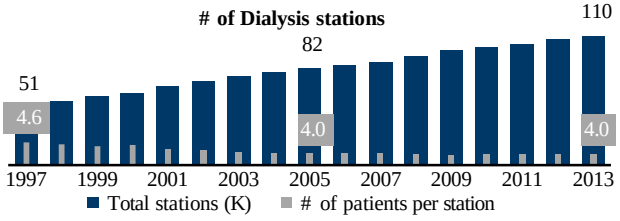


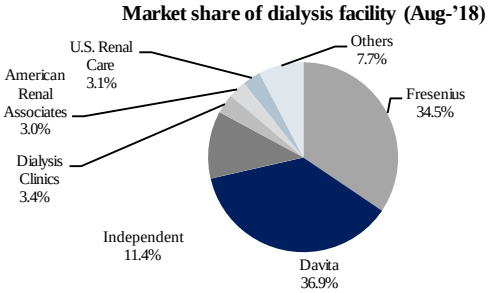


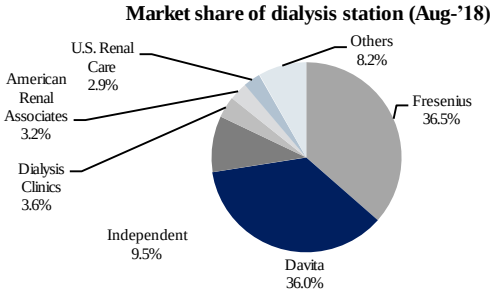
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Industry capacity has grown at a similar pace; DaVita (DVA) and Fresenius (FMS) are the majority providers

- Since 1997, dialysis station capacity has increased at a similar pace as its demand, while the ratio of patients per station has remained flat in the most recent periods
- Davita and Fresenius are the two largest provider in the U.S., accounting for ~73% of total capacity







Source: US Renal Data System (USRDS), Centers for Medicare & Medicaid Services (CMS), company filings.

(1) End stage renal disease is the stage 5 of chronic kidney disease, in which the organ is unable to effectively remove waste (condition called *uremia*) or excess fluid from one's blood (condition called *edema*), unable to balance electrolytes (abnormal heart rhythm, cardiac arrest, changes in mental state), and unable to produce certain hormones (*anemia*, feeling fatigued).

Consolidation potential

White-space still exists despite already-high consolidation level

- Although DVA and FMS combined represents 73% of total national market (by station counts), I believe there are still untapped areas from a geographical standpoint for both DVA and FMS
  - Define White space as counties where DVA or FMS does not have presence (based on station counts), and other providers (other than DVA or FMS) have more than 50% of market share:
    - White space counties represent ~9K stations in total, which is ~7% of total national capacity, or ~20% of DVA/FMS's current station counts nationally
    - Define Blue space counties similarly to White space, but expand to counties where DVA / FMS has less than 25% share, there are additional ~4K stations currently operated by smaller providers, representing additional ~10% of DVA/FMS's current station counts
  - Further loosening the criteria to consider counties where other providers have more than 25% share, White and Blue space combined, there are ~30-35% of capacity still operated by smaller providers, in counties where DVA / FMS have small or no presence
  - This fact combined with ~3% overall ESRD population growth, should be able to support +4% patients growth for DVA, without having to compete head-to-head against FMS in the near-term

	# of stations	
	Davita	**Fresenius**
National total stations	**123,983**	**123,983**
Whitespace - no presence, others > 50% share	8,957	9,093
as % of national total	*7.2%*	*7.3%*
as % of current station number	*20.0%*	*20.1%*
Whitespace - no presence, others > 25% share	10,126	10,644
as % of national total	*8.2%*	*8.6%*
as % of current station number	*22.7%*	*23.5%*
Bluespace - <25% presence, others > 50% share	3,985	3,619
as % of national total	*3.2%*	*2.9%*
as % of current station number	*8.9%*	*8.0%*
Bluespace - <25% presence, others > 25% share	6,101	7,692
as % of national total	*4.9%*	*6.2%*
as % of current station number	*13.7%*	*17.0%*
White + Blue space size - 50% threshold	12,942	12,712
as % of current station number	*29%*	*28%*
White + Blue space size - 25% threshold	16,227	18,336
as % of current station number	*36%*	*41%*

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- However it's worth noting that there are ~45% of the centers not owned by DVA/FMS are non-profit and thus are harder to acquire / squeeze out of market
- This fact needs detailed examination and in the model base case, DVA's market share comes out around ~40% by 2020, an only ~2% expansion from current level, to reflect such conservatism

Source: USRDS, CMS, company filings.

C1) Significant shareholder returns with DMG Sale

Preliminary agreement with regulators likely reached but with the government shutdown, expect the deal to close 2Q 2019

- Purchase price of DMG to UNH's Optum unit has been lowered from $4.9B to $4.34B
  - To account for the anticipated divestiture of DMG's Nevada market and underlying performance of the business (DVA will book a charge of $200 - $250M this quarter to account for the lower carrying value of its HFS assets)
  - In an effort to expedite the process to obtain FTC approval
- Although some speculate that the sale won't close, Optum will be eager to close it as DMG is worth a lot more in its hands
  - Amid regulatory scrutiny over rising costs, an escalating battle to put providers of medical care under the same umbrella as health insurance companies (CVS Health's $69B acquisition of Aetna, 3rd largest health insurer, and insurer Human signing deals with multiple providers including drugstore giant Walgreens Boots Alliance)
  - DMG's assets (HealthCare Partners & Everett Clinic) is synergistic to Optum, whose integration of data analytics, pharmacy benefits and medical services has helped fuel UNH's growth (scale up value from closely aligned footprints)
  - UNH acquired a practice that will be geographically complementary to DMG's Everett Clinic in Washington

Substantial capital flexibility for share repurchase, debt pay-down, and acquisitions

- Assuming ~$4.6B tax basis (estimated using assets held for sale minus liabilities held for sale), after tax proceeds comes out to be around $4.4B
  - Actual breakdown on the use of proceeds isn't clear; however, S&P and Moody's would lower DVA's rating if DVA fails to use proceeds to reduce debt to below 4x (as of 4Q'18, 4.5x) so I think DVA will most likely spend ~$2.7B towards debt retirement, deleveraging to 3.25x (management guidance was 3.0 ~ 3.5x)
  - Keeping up with company's moderately aggressive financial policy with regard to share repurchases, I expect company to spend considerable portion (80%) f the remainder, $1.3B, on share repurchases over 1-2 years following 1Q 2019 close
  - Company has cited "limited tuck-in acquisitions" so I think the company won't spend considerable amount of the proceeds on M&A and/or organic development of new centers

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- At 3.25x net leverage, DVA could repurchase 13% of its stock while remaining within its leverage targets, signaling positive capital position while remaining within its leverage targets

DVA Potential share repurchase under different leverage scenarios

	3.00x leverage	3.25x leverage	3.50x leverage
Cash needed to delever	$3,273	$2,735	$2,198
Cash deployable	$1,121	$1,659	$2,197
Assuming 80% used for share repo	$897	$1,327	$1,757
Stock Price (3% repo price assumption)	$59.61	$59.61	$59.61
Shares bought back	15	22	29
4Q18 shares	167	167	167
% shares	**9%**	**13%**	**18%**

Source: Company filings

C1) Significant shareholder returns with DMG Sale (cont'd)

Although buybacks are likely discounted partially, there is upside if the deal closes as some are still cautious

- $1.3B share repurchase in theory creates ~26% accretion in 2020 on levered free cash flow per share
  - These days yieldco and yield oriented business typically have a dividend yield of 7-9%, so I would argue 26.2% yield is worth waiting 2 additional years and take the execution risks

($ in millions, except for per share)	2018	2019	2020	2021	2022	2023
Base case levered OCF	$1,776	$1,517	$1,438	$1,558	$1,529	$1,512
Base case ICF	(871)	587	620	(859)	(907)	(957)
Base case levered FCF	$1,065	$967	$790	$700	$622	$555
% growth		*(9.2%)*	*(18.4%)*	*(11.4%)*	*(11.1%)*	*(10.7%)*
Static sharecount	167	167	167	167	167	167
LFCF per share	$6.38	$5.79	$4.73	$4.19	$3.73	$3.33
Period begin sharecount	167	161	132	132	132	132
(–) Buyback	(6)	(29)	–	–	–	–
Period end sharecount	161	132	132	132	132	132
Weighted avg. sharecount post buyback	164	147	132	132	132	132
LFCF per share	$6.49	$6.60	$5.97	$5.29	$4.70	$4.20
% accretion	*1.8%*	*13.8%*	*26.2%*	*26.2%*	*26.2%*	*26.2%*
Share price	$57.9					
LFCF yield	11.4%	11.6%	10.5%	9.3%	8.2%	7.4%

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Acquisition, although as noted is the least likely scenario, is a possibility given the speed limitation in organic development

- Assuming per center revenue is ~$4 million, 1.5x – 1.9x revenue multiple implies $6 - $8mm acquisition price per facility
  - High level observation suggests that effectively all smaller chain organizations or a subset of independent providers are within the target range of $1.5 - $2.0 billion
  - This scenario requires further detailed examination on financial impacts, transaction feasibility, strategic fit, and possibility for international acquisitions. I'm not factoring the potential impact in base case scenario but should bear in mind of such possibility

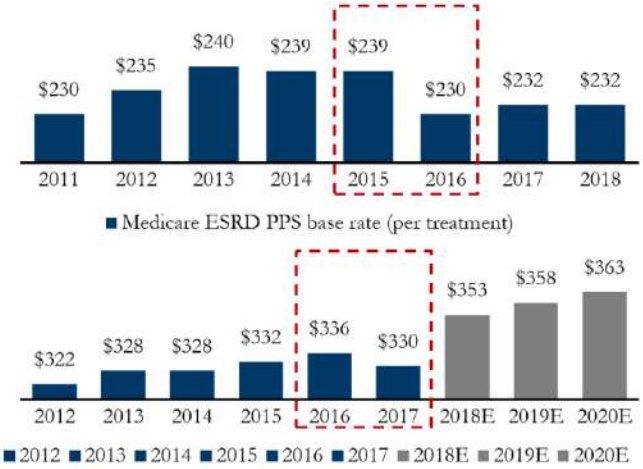
($ in millions)		Assumed acq. rice per facility		Implied acq. proceeds	
Provider name	**Facilities**	Low	High	Low	High
INDEPENDENT	820	$6.0	$7.8	$4,920	$6,396
DIALYSIS CLINIC, INC.	241	$6.0	$7.8	$1,446	$1,880
AMERICAN RENAL ASSOCIATES	218	$6.0	$7.8	$1,308	$1,700
US RENAL CARE, INC.	223	$6.0	$7.8	$1,338	$1,739
SATELLITE HEALTHCARE	62	$6.0	$7.8	$372	$484
DIVERSIFIED SPECIALTY INSTITUTES (DSI)	52	$6.0	$7.8	$312	$406

Source: Company filings
As of Dec 16, 2018, DVA.

C2) Stabilizing reimbursement and commercial mix trends

Stagnant Medicare reimbursement rates has created margin pressure for DVA, but pressure to lift in 2019

- Medicare bundled payment rate for dialysis has been growing at a slower pace than cost inflation
- Particularly in 2016, PAMA reduced bundle rate from $239 to $230, which created a $6 dip in revenue per treatment for DaVita in 2017
- However the pressure is expected to be lifted in 2019, with latest proposed base rate increase of 1.6%
  - My model base case factors in 1.0 – 1.3% annual increment in reimbursement



Commercial insurance mix has created pressure on DaVita's profitability, but trends have stabled

- During 2017, mix of commercial reimbursement has decreased slightly, causing pressure on OpInc given the profit purely came from the commercial side
- While management explained the shift as a one-time event of a drug being included in the Medicare bundle (previously covered by Part D private insurance), I did observe structural shifts in insurance exposure geographically:
  - Based on changes in coverage type (% of total population) from 2013 to 2016, DaVita's operation is relatively concentrated in states where governmental insurance coverage has penetrated faster than private insurance
  - Fresenius's operation, on the other hand, are concentrated in areas where penetration pace is more in-line with national average
    - This is one possible explanation why Fresenius's revenue composition has a higher % from private insurance vs. DaVita (~42% vs. ~31%)
  - On the flip side, majority of the white-space states (defined as states where providers other than DVA or FMS have larger than 50% share) are much more in-line with national level; this fact, if verified, would help DVA to maintain a more stable commercial mix, or improve the mix going forward
  - Coupled with management's expectation of stabilized mix, my base case model factors a flat commercial mix (treatment) going forward
  - Continuous reduction of uninsured population may also suggests upside in private insurance net revenue per treatment

	Q1 2017	Q2 2017	Q1 2018	Q2 2018	Q3 2018	Q4 2018
Patient service revenues:	%	%	%	%	%	%
Medicare and Medicare Advantage	56.3%	56.8%	58.9%	59.4%	59.3%	59.3%
Medicaid and Managed Medicaid	6.4%	6.5%	6.3%	5.9%	6.2%	6.2%
Other government	4.1%	3.9%	4.3%	4.3%	4.4%	4.4%
Commercial	33.5%	33.1%	31.1%	31.0%	30.8%	30.8%
Other revenues:						
Medicare and Medicare Advantage	–	–	–	–	–	–
Medicaid and Managed Medicaid	–	–	–	–	–	–
Commercial	–	–	–	–	–	–
Other	0%	0%	0%	0%	0%	0%
Eliminations of intersegment revenues	(1%)	(1%)	(1%)	(1%)	(1%)	(1%)
Total Revenue - U.S. dialysis	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

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2013 to 2016, change in coverage type distribution (change in %of total population)

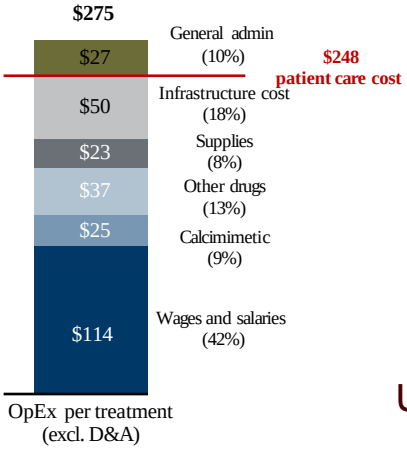
	Medicare	Medicaid	Employer Group	Non-group private	Uninsured	Other Gov	Total Government	Total Private
Where DVA has >50% share	1.8%	3.3%	(2.0%)	0.5%	(3.3%)	(0.0%)	5.0%	(1.5%)
Where DVA has >25% share	1.0%	2.1%	(1.4%)	2.2%	(3.7%)	(0.3%)	2.7%	0.8%
Where DVA has <25% share	0.7%	2.5%	(1.0%)	2.8%	(4.9%)	0.3%	3.5%	1.8%
National Average	1.0%	2.2%	(1.2%)	2.2%	(4.0%)	(0.1%)	3.1%	1.0%
Where FMS has >50% of share	1.1%	2.4%	(1.6%)	2.7%	(4.6%)	(0.3%)	3.2%	1.1%
Where FMS has >25% of share	0.9%	2.0%	(1.7%)	2.1%	(3.2%)	0.0%	3.0%	0.4%
Where FMS has <25% of share	0.6%	2.6%	(0.4%)	1.9%	(4.9%)	(0.1%)	3.2%	1.5%

Source: Census Bureau, USRDS, CMS, company filings.

C3) Margin expansion due to limited cost growth

Operating leverage may be hard to exploit but margin sees upside with limited cost growth

- Despite being a sizable provider, operating leverage can be hard to exploit given the small percentage of shared function among dialysis centers and already-high capacity utilization on a per-center basis
  - Based on illustrative Q1 '18 OpEx per treatment breakdown, at least more than ~80% of the cost are variable at center level
  - Also based on illustrative exercise, dialysis centers are likely to be operating around ~80% of full capacity now; hypothesizing 50% of the business infrastructure costs are fixed costs, a 10% volume increase only implies 1% improvement in per treatment cost

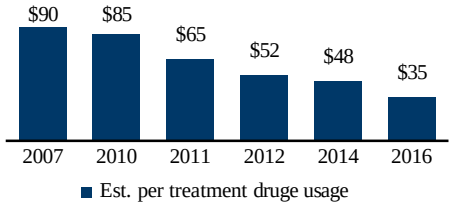


Utilization	
Machines and chair	18
Time span per dialysis	
(+) dialysis	2.5
(+) cleaning and prep	1.0
Total hours per treatment	3.5
Working hours per day	9.0
Implied # of treatment per chair	2.6
Total # of treatment per day	**46.3**
# of days operational (per week)	6.1
Total # of treatment per week	**280.8**
# of dialysis per patient per week	2.8
Implied number of patient capacity	101
Current patient per center	80
Implied utilization	79%

Cost buckets	Per treatment	Volume +10% Implied per treatment	Labor +3% Uplift
Labor	$114	$114	$118
Calcimetics	$16	$16	$16
Other pharmaceuticals	$37	$37	$37
Supplies	$23	$23	$23
Business infrastructure	$50	$47	$50
Total center level	**$239**	**$237**	**$242**
% improvement		*(0.9%)*	*1.4%*
General and admin	27.3	$25	

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- However, other cost components are not likely to increase (besides wage cost)
  - In particular, other than the inclusion of Calcimimetic,(1) overall drug cost has declined since adoption of the bundled PPS (Prospective Payment System)
  - With large market share, DVA should also be able to negotiate the cost of supplies
  - These two factors combined gives us confidence that DVA will control ~30%+ of the cost base



- Hypothesized +3% (+0.5% from inflation) increase in annual labor cost translates into ~1.4% increase in overall per treatment patient care cost
  - As such, with ~1.6% increase in Medicare reimbursement and price increase in private insurance, wages expense shouldn't create margin pressure going forward
- Model base case assumes 3% YoY increase in labor costs per treatment
- G&A cost increase consistent with historical level at ~4% YoY

Source: Company filings, public sources, MedPAC analysis of 100 percent claims submitted by dialysis facilities to CMS.

(1) Calcimimetic is a drug for ESRD patient to treat mineral bone disease. It transitioned from a drug class Part D to Part B reimbursement. Management expects the net impact of it to be a mid-single-digit margin before their indirect cost to administer the drug. This excludes any short-lived benefit that may come should generics enter the market.

R1) Ballots analogous to Prop 8 and SB 1156 pose risks on RPT

Despite DVA's recent regulatory victories, the labor union risk in California still lingers

- Governor Newsom, historically pro-union and received strong endorsement from the SEIU, elevates the risk for legislative passage of onerous dialysis legislation
- DVA's diminished public reputation (a DOJ inquiry, lawsuits) and heightened political polarization in California makes it more favorable for union advocacy efforts

	2018	2019	2020	2018	2019	2020
Revenue	$11,690	$12,113	$12,502	Implied Private RPT		
(30.0%)	$11,690	$11,178	$11,597	$752	$520	$513
(15.0%)	$11,690	$11,646	$12,050	$752	$631	$623
(10.0%)	$11,690	$11,802	$12,200	$752	$668	$660
(5.0%)	$11,690	$11,957	$12,351	$752	$705	$696
–	$11,690	$12,113	$12,502	$752	$743	$733
5.0%	$11,690	$12,269	$12,653	$752	$780	$770
Adj. EBITDA	$2,040	$1,900	$1,816	% margin		
(30.0%)	$2,040	$965	$911	17.5%	8.6%	7.9%
(15.0%)	$2,040	$1,433	$1,363	17.5%	12.3%	11.3%
(10.0%)	$2,040	$1,588	$1,514	17.5%	13.5%	12.4%
(5.0%)	$2,040	$1,744	$1,665	17.5%	14.6%	13.5%
–	$2,040	$1,900	$1,816	17.5%	15.7%	14.5%
5.0%	$2,040	$2,056	$1,966	17.5%	16.8%	15.5%
Potential EBITDA lost				% base case EBITDA		
(15.0%)	–	($467)	($453)	–	(25%)	(25%)
(10.0%)	–	($312)	($302)	–	(16%)	(17%)
(5.0%)	–	($156)	($151)	–	(8%)	(8%)

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- Based on Private revenue per treatment (RPT) sensitivity, I can see that under the modeling assumption, a 5-10% reduction in private RPT leads to 8%-16% of EBITDA lost comparing to base case; such impact would be exacerbated more in the outer years as the total treatment volume grows
- Likely coupled with the RPT reduction in the S.B. 1156 scenario is a decline in commercial patients mix, which would further contributes to margin pressure caused by lower overall RPT

- Potential scenario if ballot similar to Prop 8 is effective
- Potential scenario if ballot similar to SB-1156 (e.g. AB-290) is effective

AB-290, similar to SB-1156, introduced to limit CPA; risks are, however, well analyzed and discounted

- I believe that CPA will not be materially restricted as a large number of dialysis centers would no longer be economically viable and it would disproportionately affect centers serving patients with the greatest financial need
- In order to prevent destabilization from limiting CPA, policymakers may likely 1) lengthen the 30-month Medicare as a Secondary Payer (MSP)[(1)] coordination period by another 3 months to 33, 2) limit or delay eligibility for Medicare coverage, 3) subsidize COBRA coverage, and 4) raise the Medicare reimbursement rate

Source: Company filings.

R2) SB-349 could create a cost drag

SB-349, a bill that could cost ~$232M, will not likely pass as provisions would create unintended consequences

- If effective, requires minimum staffing of 1 nurse per 8 patients (currently 1:12), 1 technician per 3 patients (currently 1:4), 1 social worker and dietitian per 75 patients (currently 1:79)
  - The ratios in the California bill are higher than in all other states that are mandating (Georgia, Maryland, Massachusetts, New Jersey, Oregon, South Carolina, Texas, Utah, Washington DC)
  - No evidence/studies that these provisions would improve quality of care and in fact, serious unintended consequences are likely (decreasing access to care, decreasing choice of dialysis facilities, and treatment shifts)
    - Data, from independent sources, indicate that outcomes (including survival, rates of hospitalization and infection, and patient satisfaction) are not superior in states where mandated staffing ratios are in effect
    - They also show that California, where there are presently no mandated staffing ratios, outcomes are among the best in the US
  - The proposed ratio will require hiring of ~1,000 full-time equivalent nurses while a shortage of ~141,000 nurses in California is expected by 2030
  - Numerous dialysis facilities will be unable to meet these mandates because many of them are having challenges in recruiting newly graduated registered nurses to California due to exceptionally high costs of housing
  - Patients would likely be displaced form their current facilities and endure extended travel to a facility adhering to mandated staffing ratios
- If effective, requires 45 minutes between patients transition (to complete prescribed session, remove disposable materials such as dialyzer and tubing, ensure that the patient is clinically stable, disinfecting the equipment, and preparing for the next patient for his/her session)
  - In rural areas, considerable proportions of dialysis centers are currently running 4 treatment shifts per day 3 or 6 days per week (starting ~4AM and extending through ~11PM) to accommodate the needs of patients
    - Imposing a fixed and lengthy transition time will eliminate the ability to offer a 4th shift in these facilities and reduce flexibility in providing the scheduled session lengths for late patients, leading to displacement of patients and to shortening of dialysis sessions
- If effective, requires government inspection
  - The dialysis industry projects that SB 349 could lead to closure of up to 20% of currently active units and delay development of new facilities in areas needing additional capacity

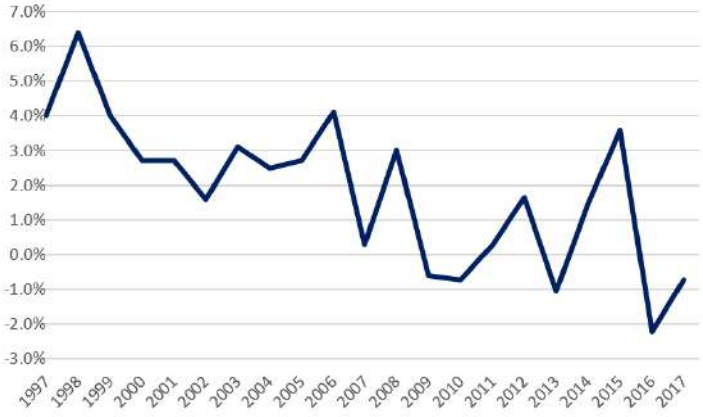
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# of California Clinics	292					
# of California Patients	23,242					
Taxes and benefits as % of employee wages	30%					
Incremental hour per day due to mandated transition	0.5					
Hourly Wage		$37.50		$16.00		$30.00
	Registered Nurses		**Dialysis Technicians**		**Dietians & Social Workers**	
	Current	Proposed	Current	Proposed	Current	Proposed
Patient to staff ratio	12	8	4	3	79	75
Total # of Staff	1,937	2,905	5,811	7,747	294	310
Increase in Staff Hire		*968*		*1,937*		*16*
Weekly hours	40.0	43.0	40.0	43.0	40	43
Annual Wages	$151	$244	$193	$277	$18	$21
Tax and benefit cost	$45	$73	$58	$83	$6	$6
Total Staff Cost	**$196**	**$317**	**$251**	**$360**	**$24**	**$27**
Cost increase		*$120*		*$109*		*$3*
Total financial impact		**-$232**				

Source: Company filings. Clinical Journal of American Society of Nephrology. Interviews with doctors and ex DVA nurses. United States registered nurse report. Data from Dialysis Facility Compare and the ESKD Quality Incentive Program. Guidelines for dialysis facility infection control published by the Centers for Disease Control and Prevention. Glassdoor

R3) Potential Structural Payer Mix Challenges

Growth in the below 65 years old ESRD incident[1] count (proxy for commercial population) has decelerated



- Since the prevalence count given patients revert to Medicare coverage after 30 months, some believe that a good proxy for sizing the commercially insured population with ESRD is to analyze the rolling 3-year sum of incidents counts
  - DVA receives reimbursement ~4x higher from commercially insured vs. Medicare treatments. Thus, this is a troublesome trend and I need to constantly monitor it as well as to fully understand the narrative behind it
  - That being said, I think it's not sensible to forecast out the potential growth based a rolling average of previous years nor make a definitive conclusion on this trend (such as the total addressable market for new pre-65 ESRD patients could be flat for the foreseeable future)
- Many observers believe growing awareness of risk factors contributing to CKD, the precursor to development of ESRD, and improving diabetes trends are the largest factors influencing the deceleration within the end-markets

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Patients Act and Medicare FFS shifting to MA, ~$30M earnings and ~$70M EBITDA tailwinds, will offset

- **H.R. 4143 PATIENTS Demonstration Act, allowing providers to offer integrated care**
  - Access to a care coordination team and medically necessary transportation, and the savings achieved would be returned to eligible sponsors
  - Status: introduced; referred to subcommittee on Health in October 2017 (120+ co-sponsors of the bill)
  - Exact impact is unclear; Early ESRD Seamless Care Organizations (ESCOs; today, there are less than 40) results demonstrated annual per patient savings of around ~$4K, which is 5.3% of average Medicare spend of ~$88K per year
  - Combines precedents established from Accountable Care Organizations and Medicare Advantage to enhance the integrated care model
  - Unlike ESCOs, the Act would empower and incentivize referring physicians and hospitals to engage with nephrologists and more effectively focus on care design to manage rehospitalizations
- **If 10% of Medicare FFS shifts to MA, a ~$23M annual opportunity**
  - Assumes an incremental 3.3% uptake in each year from 2021-23, DVA's Medicare/MA mix of 74.5%
  - Implies ~10% of the 'market' could be enrolled within a MA plan over time which is about 33% of the current overall MA marketplace
  - ESRD MA penetration would unlikely ever resemble national MA penetration given the chronic nature of the patients and desire to maintain continuity
  - It is possible that over time the incremental profit arbitrage between the two payers could converge

Source: Company filings

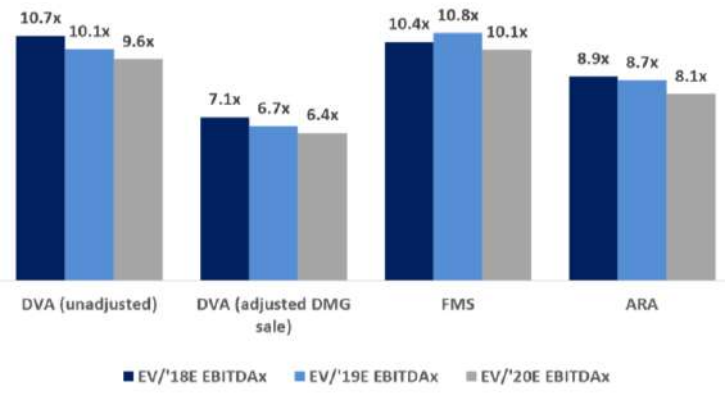
(1) Incident (# of newly diagnosed patients) differs from prevalence (# of patients with ESRD), which is discussed in page 5 (industry overview)

(2) Fee-for-Service is a program that provides hospital insurance (Part A) and supplementary medical insurance (Part B) to eligible citizens

Valuation summary

Upside potential looks tempting but near-term downside risk skews return to the negative

- On a first glance, DVA seems to be trading at a similar multiple range comparing to its peers
  - However assuming that current share price reflects the benefit of $4.4B cash proceeds, adjusting the cash amount out of enterprise value shows that DVA actually trades at ~7.0x adj. EBITDA range, a ~30% discount to FMS's and ARA's multiple
  - I believe the adjusted multiples are fair reflection of public sentiment given that FMS's and ARA's limited exposure in California
    - FMS U.S. has ~5-6% facilities / stations in California
    - ARA has ~2% facilities / stations in California



	Down	Base	Upside
2019 adj. EBITDA	$1,865	$2,523	$2,743
(x) Adj. EBITDA multiple	9.0x	7.5x	9.0x
Implied EV	**$16,784**	**$18,923**	**$24,683**
Net Debt	$9,726	$9,726	$9,726
Implied EqtV	**$7,058**	**$9,197**	**$14,957**
(/) FDS	163	132	132
Implied share price	**$36.4**	**$69.7**	**$113.3**
% to current	*-37.2%*	*20.4%*	*95.8%*
DCF value	**$21.6**	**$65.6**	**$85.6**
% to current	*(62.2%)*	*15.0%*	*50.0%*

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- **Base case**:
  - DMG sale closes (3.25x leverage, ~$1.3B used for share repo – 13% of shares)
  - No change in treatment mix
  - +1.6% increase on Medicare reimbursement starting in 2019 (additional ~$100M EBITDA in 2019)
  - RPT: -0.8% (private)
  - +3% labor cost, +4% G&A cost, +2% US ancillary and international margin

- **Upside:**
  - DMG sale closes (3.5x leverage, $1.8B share repo – 18% of shares)
  - Favorable +5bps mix increase towards private insurance from the 10% extension of coordination period (every 1% change in mix translate into ~$150M EBITDA upside)
  - RPT: +1.7% (gov), +0.2% (private), +2.5% labor cost, +3.7% G&A cost, +2.5% US ancillary and international margin

- **Downside:**
  - DMG sale doesn't close but is able to sell/restructure some of DMG assets
  - Bill analogous to Prop 8 (~$312M loss in adj. EBITDA, ~10% of base case EBITDA) and bill AB-290 are effective (~$156M loss in adj, EBITDA, ~8% of base case EBITDA) but policymakers take various measures to prevent destabilization from liming CPA
  - Unfavorable -15bps mix increase towards government treatment
  - RPT: +0.8% (gov) & -1.3% (private), +4% labor cost, ++5% G&A cost, +1.5% US ancillary and international margin

Source: Company filings, market data.
Based DCF on a WACC of 8.7% (12.7% cost of equity)

Major additional diligence topics

Regulatory exposure

- Likelihood of each scenario occurring and the impact of relevant bills would have on DVA (e.g. C.A. A.B. 251 (SEIU) that would require 85% of dialysis center revenue used to spend on patient care)

U.S. business diligence

- **Composition of private insurance reimbursement**
  - In / out-of-network percentages and trends in each geographic area (by county / state)
  - Composition of different types of commercial contracts and its financial characteristics (if available)
  - Historical trend in private RPT and drivers
- **In-home dialysis**
  - Financial implication for DVA if U.S. in-home dialysis share starts to catch up to international level
- **Cost**
  - Net impact of calcimimetics and benefit that may come should generics enter the market, biosimilars, drug therapies
- **FMS**
  - Potential tactics FMS can deploy to compete with DVA on local basis
  - FMS's operating / cost structure and how does it differ (or not) from DVA
- **Integrated care (Patients Act)**
  - Understand the scale of savings if successfully rolled out
- **U.S. ancillary services**
  - Better understand the business model
  - Analyze operating metrics and profitability potential

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International business diligence

- **Market environment**
  - Local healthcare payment mechanism, local regulations
- **Local competitive landscape**
  - Number of providers, provider concentration
- **Facility operation**
  - Capacity utilization, patients and treatment volume, breakdown of operating costs

Capital deployment

- **Potential M&A scenario**
  - Operation overlap, potential sources of synergies, strategic acquisition rationale
  - Financial impacts on growth, profitability and cash flow

Source: Company filings, market data.

Sean Lee | seanlee21@gsb.columbia.edu | 646-515-3166

Broadcom (AVGO) – Long (Prob-weighted IRR 17%, 30-month target, Upside: +50%)

Valuation	4/21/20	Key Financials ($M)	2019	2020E	2021E	2022E
Share Price (USD)	**$259.97**	**Total Revenue**	**$22,597**	**$25,254**	**$26,901**	**$28,813**
52-week low/high	$155-$332	*YoY growth*	*8.4%*	*11.8%*	*6.5%*	*7.1%*
Shares Outstanding *(M)*	400	*vs. Consensus*	--	*5.1%*	*5.9%*	*9.6%*
Market Cap ($B)	$104	**Semiconductor Rev.**	**$18,117**	**$18,310**	**$19,402**	**$20,789**
- Cash	$6	*YoY growth*	*-8.3%*	*1.1%*	*6.0%*	*7.1%*
+ Preferred & Other	$4	*vs. Consensus*	--	*7.7%*	*6.5%*	*8.7%*
+ Debt	$45	**Infra. Software Rev.**	**$4,480**	**$6,944**	**$7,500**	**$8,024**
Enterprise Value ($B)	$147	*YoY growth*	*309.5%*	*55.0%*	*8.0%*	*7.0%*
Dividend Yield	**5.3%**	*vs. Consensus*	--	*4.3%*	*5.8%*	*3.1%*
ADTV ($B)	$8	**Gross Profit**	**$12,483**	**$14,807**	**$16,874**	**$17,781**
Float	97.4%	*YoY growth*	*16.3%*	*18.6%*	*14.0%*	*5.4%*
Short Interest as % of float	**1.4%**	*vs. Consensus*	--	*9.6%*	*13.4%*	*12.0%*
Days to Cover	0.9	*Gross Margin*	*55.2%*	*58.6%*	*62.7%*	*61.7%*
% of shares held by Insider	0.2%	**EBITDA**	**$9,252**	**$10,766**	**$10,014**	**$13,257**
EV/EBITDAx (LTM)	**14.5x**	*YoY growth*	*0.4%*	*16.4%*	*-7.0%*	*32.4%*
Debt/EBITDAx (LTM)	**4.5x**	*EBITDA margin*	*40.9%*	*42.6%*	*37.2%*	*46.0%*
EBITDA/Interest (LTM)	**6.7x**	*vs. Consensus*	--	*0.7%*	*8.9%*	*7.3%*

	Low	Base	High
Synergy Realization	60%	75%	100%
Other Key event	Recession & Dividend Cut	Wireless unit and Core business outperforms expectation.	$22B sale of wireless & industrial units. Buys "core" companies.
Total Rev. CAGR (2022)	***1.8%***	***8.4%***	***10.0%***
vs. Consensus	*-9.2%*	*9.6%*	*14.4%*
Semiconductor Revenue	**$16,876**	**$20,789**	**$21,117**
vs. Consensus	*-11.8%*	*8.7%*	*10.4%*
Software Revenue	**$6,976**	**$8,024**	**$8,944**
vs. Consensus	*-10.3%*	*3.1%*	*15.0%*
EBITDA (2022)	**$11,667**	**$13,257**	**$13,892**
vs. Consensus	*-5.6%*	*7.3%*	*12.4%*
EBITDA Multiple	**9.0x**	**12.0x**	**17.0x**
vs. 10 Yr Avg	*-33.5%*	*-11.3%*	*25.6%*
Enterprise Value	$105,003	$159,088	$236,169
- Debt (2022)	$40,798	$38,298	$35,798
+ Cash (2022)	$9,773	$22,635	$23,008
Equity Value (2022)	$73,978	$143,425	$223,378
S/O (2022)	401	389	370
Target Price	**$184.48**	**$368.27**	**$603.36**
Upside/(downside)	***-29%***	***42%***	***132%***
Probability of Likelihood	20%	55%	25%
Weighted Avg. TP		**$390.28**	
Prob. Weighted IRR		**16.9%**	
Upside/(downside)		**50.1%**	

Summary: AVGO is a dominant fabless semiconductor (65% market share) and enterprise software (40% market share) company that has the #1 position in 11 markets that represent 75% of the company's sales. However, it's trading at a discount valuation due to the coronavirus market selloff. The street fails to fully capture the secular growth that wired infrastructure and software businesses have while citing overblown risks such as high leverage and growing portfolio complexity. I believe AVGO has a compelling upside of 17% 2.5-yr IRR with a risk-reward ratio of 3.3.

Company Segment Description:

Wired Infrastructure (39% of sales): Co-develops chips for cable modems and routers for cloud-scale networking with sticky customers. AVGO is #1 in System-on-Chip (SoC) platform solutions for set-top boxes. It won Application-specific integrated Circuit (ASIC) designs with Nokia, Ericsson and ZTE for the 5G base station and radio head platforms.

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2) Wireless Communications (23% of sales): 3 key product lines are a) $2.2B radio frequency (RF) filters (best-in-class film bulk acoustic resonators, FBAR, that are used in smartphones); b) $2.2B combo chips for WiFi-Bluetooth and GPS; c) $1.1 B custom mixed-signal products that enable touch-screen technology and wireless charging.

3) Enterprise Storage (13% of sales): Provides custom solid-state drive (SSD) and hard disk drive (HDD) controller solutions for high-capacity drives into customers such as Intel and Samsung. It competes with Marvell for #1 position.

4) **Industrial/IP Licensing (5% of sales):** Provides motion control encoders and LEDs for factory automation & power generation.

Infrastructure Software (20% of sales): The revenue comes from acquired companies - a) CA, a developer of enterprise software such as mainframe and cloud management (53%); b) Symantec's corporate cybersecurity (24%); c) Brocade, a storage networking (23%).

Why the opportunity exists:

COVID-19 sell-off: AVGO's stock plummeted due to supply chain disruption (chip orders now require a longer lead time) and expected revenue decline. However, the selloff is also due to systematic risk and the current dynamics are not as bad as the short thesis portray. For instance, the company's primary warehouse in Malaysia and manufacturing facility in Colorado (develops FBAR) are currently fully operational. Furthermore, Malaysia just reported the lowest daily increase in coronavirus cases since the lock down, signaling that AVGO's assembly and testing subcontractors in the country could resume in the near term. Moreover, most of its semiconductor wafers are manufactured in Taiwan where the impact of coronavirus has been limited. As for the demand, the sales of products have been relatively stable as customers are stocking up on parts in anticipation of potential future supply chain disruptions. Likewise, the demand for software products has relatively been consistent as they run the critical processes of the large enterprises. Although AVGO will not be immune to prolonged pandemic, the company's recurring software revenue and multi-year ratable contracts with the world's largest enterprises would help sustain the stock.

Investment Thesis

1. Concerns about the wireless business are overdone: AVGO's skeptics point to a lower margin profile (annual design changes and commoditization risk), weak consumer demand for smartphone and potential replacement of FBAR by Qorvo's superior technology. However, my contrarian view is that the wireless segment will do better than what the street anticipates. Even though the CEO, Hock Tan, has a reputation for underspending on commodity businesses, he invests heavily on industry leading products, especially if the customer agrees to pay for it. Since AVGO has agreed to supply $15B worth of wireless components for Apple over 3.5 years, the company will spend more on R&D and maintain its dominance in RF filtering and wireless markets. Although I also expect weak 2020 results for the segment,

the strong content gains with 5G (as it becomes a key vendor to Apple & Samsung in pursuit of their own processors and modems) and higher mix as a percentage of new phones over the next two years will offset unit declines. I also think AVGO will release millimeter wave spectrum 5G RF front end designs. Furthermore, my primary research with industry consultants and a former business development manager at Apple indicate that the $15B agreement may not include the mixed signal revenue. Thus, I've additionally modeled $1.2B annual revenue over 3.5 years.

Base Scenario	Historical			Projected		
in US$M	2017	2018	2019	2020E	2021E	2022E
Wired Infrastructure (Core)	**$8,465**	**$8,756**	**$8,858**	**$9,744**	**$10,280**	**$11,102**
vs. Consensus	--	--	--	*5.1%*	*4.7%*	*5.7%*
growth YoY	*27.9%*	*3.4%*	*1.2%*	*10.0%*	*5.5%*	*8.0%*
as % of revenue	*48%*	*42%*	*39%*	*39%*	*38%*	*39%*
Wireless Communications	**$5,467**	**$6,463**	**$5,197**	**$4,626**	**$5,042**	**$5,546**
vs. Consensus	--	--	--	*3.9%*	*4.0%*	*4.3%*
growth YoY	*47.5%*	*18.2%*	*-19.6%*	*-11.0%*	*9.0%*	*10.0%*
as % of revenue	*31%*	*31%*	*23%*	*18%*	*19%*	*19%*
Enterprise Storage (Core)	**$2,822**	**$4,587**	**$2,938**	**$3,026**	**$3,147**	**$3,273**
vs. Consensus	--	--	--	*2.9%*	*10.4%*	*9.1%*
growth YoY	*25.4%*	*62.5%*	*-36.0%*	*3.0%*	*4.0%*	*4.0%*
as % of revenue	*16%*	*22%*	*13%*	*12%*	*12%*	*11%*
Industrial & Other	**$882**	**$1,042**	**$1,130**	**$915**	**$933**	**$868**
vs. Consensus	--	--	--	*3.4%*	*3.7%*	*5.9%*
growth YoY	*33.2%*	*18.2%*	*8.4%*	*-19.0%*	*2.0%*	*-7.0%*
as % of revenue	*5%*	*5%*	*5%*	*4%*	*3%*	*3%*

2. Outlook on core businesses (wired infrastructure, enterprise storage, infrastructure software) is too conservative: With Cisco as a new competitor in the merchant silicon market for cloud networking to address operators' concerns about AVGO securing too much negotiating power (AVGO owns 85% of all cloud datacenter silicon), bears argue that wired infrastructure segment's top-line growth and margin would be under pressure. I beg to differ. Broadcom has a broad portfolio that boasts specs that are better than what Cisco announced and what other competitors have. I also believe corporate clients will not be trying alternative concepts with new vendors at this uncertain time. Thus, its dominance in the merchant silicon market, which will be in 63% of all Ethernet switches that ship in 2022, is here to stay. Another bears' argument is that the demand from the data-center end market is likely to drop as companies trim their IT budgets and after people return to a work, exacerbated by recession and double ordering. However, I believe secular tailwinds will offset headwinds. For instance, there will be networking upgrade cycle to 200G/400G networking speeds, strength in web and endpoint security as well as data loss prevention, and robust cloud capex spending by Google, Amazon, Facebook, and Microsoft due to capacity build-out. As for the enterprise storage segment, both the cloud HDD and SSD shipments will grow 16% this year on the back of strong cloud datacenter capex trends. As a result, the core businesses will outperform the street's expectation.

Catalyst

$22B Sale of wireless and industrial units: Even though the company opted not to sell RF business, my variant opinion is that potential divestiture deals aren't off the table. AVGO's classification of these divisions as "financial assets" highlight the fact that they don't have any synergies with other businesses due to their unique customers, technology and supply chain characteristics. As the street (consensus) is modeling 14% and 22% decline YoY for wireless and industrial segments respectively, the asset sales would remove an overhang on AVGO stock. Moreover, the deals would generate cash to deleverage and/or acquire more lucrative enterprise software companies. I valued the RF unit at $10B, the Wi-Fi business at $6B, the mixed signal product unit at $1B, and the industrial segment at $4B based on comps and precedent transaction analysis. On my upside scenario, I forecasted these deals to be at different times over two years.

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Risks

1. Empire building: I am worried about AVGO's sustainability of acquisitive model and ability to realize promised synergies ("can Symantec generate $2B annual revenue with headcount reduction?"). However, the decentralized structure (mitigates management's dilution of focus) and the CEO's track record of being more of an asset cherry-picker (high 74% ROIC - EBIT/PPE+NWC) provides me assurance. He has only bought businesses with strong share in profitable markets that don't require excessive investment while divesting those that doesn't appeal to his customer base. His decision to penetrate "irrelevant" software market has yet proven to be a great one given how the defensible portfolio is weathering the recent headwinds. Furthermore, it will be interesting to monitor the development of portfolio licensing agreement to cross-sell products and software. On my base scenario, I conservatively modeled the company to realize 75% of synergy.

2. Liquidity concerns: To quantify the amount we could lose if I'm wrong, I assumed a draconian scenario (recession due to prolonged coronavirus, dividend cut, and credit rating downgrade into the junk bond market, where it would have a difficult time renewing its existing debt). I incorporated all the factors that rating agencies consider in downgrading AVGO (summarized in the table). Even in the extreme scenario, the interest coverage ratio is 4.3x (doesn't violate debt covenant which requires it to be >3.0x) due to high variable COGS costs, higher revenue mix higher margin infrastructure software business, and strong FCF. Thus, contrary to the short thesis, the concerns on AVGO's leverage is overblown and its acquisitive model isn't faltering. In fact, the stock is poised to jump in the event of credit rating upgrade which would address the credit risk.

	Low	Base	High
Credit Rating	HY (BB+)	IG (BBB-)	IG (BBB)
Total Debt/EBITDA	**3.5x**	**2.9x**	**2.6x**
Net Debt/EBITDA	2.7x	1.2x	0.9x
EBITDA/Interest Expense	4.3x	6.4x	7.5x
Total Debt/FCF	9.4x	5.7x	4.2x
Rating agencies' criteria:	**Downgrade**	**Maintain**	**Upgrade**
Total Debt/EBITDA	**>3.0x**	**2.5x - 3.0x**	**3x**
Total Debt/FCF	> 8.0x	~7x	~5x
Capital allocation	acquisitions w/o sufficient profitability or debt reduction	$10B M&A, dividend=50% of pre-dividend FCF.	--
Other	Negative organic revenue growth from aggressive R&D cut	Revenue down by mid-single digits in 2020 and low growth through 2022.	Profitability growth, debt reduction. Synergy realization.

Valuation:

I applied 12.0x EV/EBITDA multiple on my 2022 estimates. Considering that AVGO's 10-yr average EBITDAx is 13.5x (11% discount) and peers were trading at 17x before the entire market crashed, I believe it's conservative. Despite the company's high leverage, its revenue growth tis high (12% vs. -1% peers) and margin is superior (46% vs. 40% peers).

(US$Bn)	Equity Value	Ent. Value	Rev growth 2020E	EBITDA Margin	2019 EV/ EBITDA	2019 P/FCF	2019 Net Debt /EBITDA	EV/ EBITDA 2022E
Intel	$245	$257	1.1%	45.5%	7.9x	14.5x	0.4x	6.6x
NVIDIA	$161	$153	18.8%	31.0%	44.9x	37.4x	0.0x	23.5x
Qualcomm	$82	$87	-12.2%	41.5%	8.5x	11.7x	0.5x	8.6x
Cisco	$172	$162	-5.1%	32.6%	9.6x	11.6x	0.0x	8.6x
Texas Instruments	$101	$101	-9.3%	49.1%	14.3x	17.3x	0.1x	13.7x
Semiconductor Peers	**$152**	**$152**	**-1.3%**	**39.9%**	**17.0x**	**18.5x**	**0.2x**	**12.2x**
Broadcom	$102	$144	11.8%	45.6%	14.0x	10.8x	3.0x	10.9x

Sean Lee | seanlee21@gsb.columbia.edu | 347-640-0930

Long Naver (KRX:035420) - Prob-weighted IRR 27% (36 months – June 2022)

as of 2018		Low (35% prob): $90.14	Base (55% prob): $133.51	High (10% prob): $183.67
Naver Core (62% of sales, 134 % of EBIT)	ad/search (37% sales)	**12.9x P/E ex-cash:** Ad agencies find more alternative ad platforms	**14.1x P/E ex-cash:** Naver TV and V Live demonstrate resilience to YouTube/Instagram in video ads	**15.1x P/E ex-cash:** mobile ads (home banner) is well received
	E-Commerce (16% sales)	**2.9% take-rate:** price war (discount promotions)	**3.7% take-rate:** # of merchants joining Naver Smart Store continues to grow +15%	**4.2% take-rate:** Naver offers most differentiated services, network effect
	Pay (4% sales)	**+19% GMV:** Naver shopping doesn't grow fast and people discontinue using N Pay on the platform	**+28% GMV:** Naver shopping continues to grow with ~95% of people continuing to use Npay on the ecosystem	**+41% GMV:** offline payment integration with Naver Reservation is well received by Korean consumers
LINE	Messenger	**162M MAUs:** users decline, concentrating in its 4 key mkts (Japan, Thailand, Indonesia, Taiwan)	**193M MAUs:** user growth declines by 10% (esp. in Indonesia)	**203M MAUs:** user growth is flat
	ad (27% sales)	**User engagement fall to 75% DAU/MAU:** corporate account ads fall	**Flat user engagement (85% DAU/MAU):** display ads grow in line with historical avg rate	**Flat user engagement (85% DAU/MAU:** Sales Promotion grows it into 3rd business pillar alongside account and display ads
	Pay (1% sales)	**1x EV/Sales:** LINE Pay is a negative NPV. Rakuten or Softbank buys it	**3.2x EV/Sales:** Oligopoly player. Competition around value proposition, rather than on rebates. Disciplined on marketing spending	**5.8x EV/Sales:** LINE is a top player in oligopoly. Grows exponentially with economies of scale and operating leverage
Conglomerate discount		**15% (LINE Pay divestiture/writedown & corporate governance is a concern):** Rakuten or Softbank buys LINE Pay	**20% (no LINE Pay spin-off & corporate governance is a concern):** market acknowledges benefits of a diversified portfolio	**15% (LINE Pay spin-off & corporate governance concern is overdone):** new dedicated fintech investors, management team & capital structure
Naver (Core + LINE)		**9.9% sales CAGR:** multiples 20% discount to the industry avg	**11.9% sales CAGR:** multiples 15% discount to the industry avg	**15.5% sales CAGR:** multiples 5% discount to the industry avg

Buy recommendation

Naver is an underappreciated compounder (top line growing at 18% CAGR) with undervalued tech companies, including the dominant search engine (9.4x P/E 2020E) and world's 8th largest mobile messenger LINE (3.2x P/S 2020E). Naver's discount is primarily driven by EBIT margin erosion from decelerating core sales growth and widening losses of LINE's fintech startup. I believe Naver's profitability will turnaround in 2022 as core revenue re-accelerates on the back of rising e-commerce businesses and as LINE Pay moderates its growth investments after becoming a leader in a more mature Japan fintech industry. Moreover, LINE Pay's possible spin-off will highlight the mispricing in the remainder of the business. I am convinced Naver will close 27% gap to its intrinsic value of $123.

Naver (KRX: 035420)	5/21/19
Share Price (USD)	$97
Shares (M)	164.8
Market Cap	**$16,015**
- Net Cash	$1,291
Enterprise Value	**$14,724**
Treasury shares	$1,810
Net cash ex-LINE	$1,017
EntV ex-LINE/treasury/cash	**$8,288**
Investments (excl. LINE)	$1,364
Dividend Yield	0.26%
ADTV (M)	0.1
Float	74.8%
Short Interest	7.8%
Founder ownership	3.8%
Foreigner ownership	60.4%

LINE (NYSE: LN)	
Share Price (USD)	$28.32
Shares (M)	240.7
Market Cap	**$6,817**
- Net Cash	$274
Enterprise Value	**$6,542**
Dividend yield	0%
ADTV (M)	0.6
Float	19%
Short Interest	9.1%
Naver's ownership	72.7%
Insider ownership	3.9%

in US$Mn unless specified otherwise	Historical			Projected				CAGR Growth		% of Total Sales	
KRW and JPY translated into USD	2016	2017	2018	2019E	2020E	2021E	2022E	16-18	19-22E	2018	2022E
Total Sales	**3,460**	**4,025**	**4,807**	**5,349**	**5,935**	**6,662**	**7,488**	***17.9%***	***11.9%***		
Naver Core Sales	**2,147**	**2,520**	**2,975**	**3,413**	**3,851**	**4,330**	**4,874**	***17.7%***	***12.6%***	***61.9%***	***65.1%***
Ads (90% banner, 10% video / 78% portal, 12% BAND, 10% others / 60% mobile, 40% PC)	344	414	493	547	588	632	680	*19.8%*	*7.5%*	*10.3%*	*9.1%*
Business Platform (63% Search, 37% Shopping / 70% mobile, 30% PC)	1,604	1,853	2,130	2,373	2,607	2,864	3,146	*15.2%*	*9.9%*	*44.3%*	*42.0%*
IT Platform (75% Pay, 15% WORKS-*B2B messenger software,* 10% cloud)	104	188	307	434	594	782	992	*72.0%*	*31.8%*	*6.4%*	*13.2%*
Content Service (33% Webtoon-*cartoon* , 33% V LIVE-*video* , 33% Music-streaming)	89	88	109	119	126	133	140	*11.0%*	*5.5%*	*2.3%*	*1.9%*
LINE Sales	**1,319**	**1,481**	**1,768**	**1,877**	**2,021**	**2,251**	**2,531**	***15.8%***	***10.5%***	***36.8%***	***33.8%***
Ads (52% account fees, 36% Display, 12% Others)	--	866	1,007	1,136	1,289	1,456	1,634	*16.3%*	*12.9%*	*20.9%*	*21.8%*
Communication (90% Stickers & Theme, 10% LINE Call)	--	281	266	272	260	248	237	*-5.3%*	*-4.4%*	*5.5%*	*3.2%*
Content (70% GAMES, 20% Manga, 10% Music-*streaming*)	--	373	356	347	332	317	303	*-4.8%*	*-4.4%*	*7.4%*	*4.0%*
Other Core (50% NAVER Matome- social network and 50% LINE Baito-*job search platform*)	--	26	32	47	55	66	78	*20.9%*	*18.7%*	*0.7%*	*1.0%*
LINE FRIENDS (character goods)	--	111	182	204	219	259	292	*59.2%*	*12.8%*	*3.8%*	*3.9%*
Strategic (70% Mobile, 15% Pay, 10% Shopping/food delivery/travel, 5% Ad/search)	--	--	81	123	185	271	398	*60.2%*	*46.8%*	*1.8%*	*5.3%*
Other Strategic Businesses (Camp Mobile - SNOW)	**(6)**	**23**	**64**	**60**	**63**	**81**	**84**	***215.0%***	***11.8%***	***1.3%***	***1.1%***
Total (Naver Core + LINE) EBIT	**948**	**1,073**	**813**	**697**	**1,006**	**1,233**	**1,660**	***-24.3%***	***33.5%***		
% Total EBIT margin	***27.4%***	***26.7%***	***16.9%***	***13.0%***	***16.9%***	***18.5%***	***22.2%***				
Naver Core EBIT	833	1,013	1,087	1,026	1,196	1,414	1,670	*7.2%*	*17.7%*		
% Naver Core EBIT margin	*38.8%*	*40.2%*	*36.5%*	*30.1%*	*31.1%*	*32.7%*	*34.3%*				
LINE EBIT	127	132	(165)	(352)	(202)	(180)	(25)	*-225.0%*	*-58.4%*		
% LINE margin		*8.9%*	*-9.3%*	*-18.8%*	*-10.0%*	*-8.0%*	*-1.0%*				
Total (Naver Core + LINE) NI	**660**	**662**	**540**	**564**	**646**	**682**	**729**	***-18.4%***	***9.0%***		
Naver Core NI	561	730	774	838	874	1,010	1,132	*6.0%*	*10.5%*		
LINE EntVal/Sales	5.0x	4.4x	3.7x	3.5x	3.2x	2.9x	2.6x				
Total (Naver Core + LINE) P/E	**24.3x**	**24.2x**	**29.6x**	**28.4x**	**24.8x**	**23.5x**	**22.0x**				
Naver Core P/E, ex-LINE/cash/treasury	14.7x	11.3x	10.6x	9.8x	9.4x	8.2x	7.3x				

Note: % breakdown by services obtained from my interviews with managements of Naver/LINE and primary research. They are not publicly disclosed.
Showing only from 2017 for LINE because of LINE's new accounting classifications.

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Business and Industry Overview

Naver core (62% of sales, 134% of EBIT) is an internet portal/ads (37% of sales): Given that 83% of Koreans begin shopping by using search engine to find best deals, $15B market cap company's dominance in transactional stage of the marketing funnel (74% of search market share) enable it to retain 63% of digital ad market share. When online marketplaces terminated contracts with Naver to avoid commission on transactions, they all came back shortly thereafter as traffic from Naver search accounted for 25% of their traffic. The intensified competition in e-commerce (Coupang receiving additional $1.5B) signal a reacceleration in Naver's ad sales growth (15% CAGR through 2022).

LINE (37% of sales, -20% of EBIT) is a mobile messenger (27% of sales) and entertainment business (6% of sales): LINE owns the attention of 203M MAUs with mobile game, streaming music, and social network services. To gain exposure to secular tailwinds in its key market Japan (government is promoting cashless payment from 18% to 45% by 2025), Naver is investing $915M (20% of sales) on LINE Pay. However, the competition has been fierce; investors are pricing in LINE Pay's low chance of success in becoming a leader and profitable in an industry that is engaged in a promotional discount war.

Investment Thesis

1. Naver core's shift in sales mix towards higher-multiple e-commerce and digital payment businesses is under-covered: Tech giant's deliberate lack of disclosure (to avoid chronic antitrust measures) makes it hard for investors to follow the company's revenue mix and outperformance in the growing sectors. My fundamental research indicate that Naver core's e-commerce and payment businesses will constitute 28% and 8% of sales, respectively, by 2022 (currently, 16% and 4% respectively) and that the company is on the cusp of long-term value creation. On the front page of 30M Monthly Active Users' default portal, Naver offers a gateway into its own shopping platform and convenience by enabling Naver Pay to facilitate transactions on its ecosystem. Since 67% of Korean internet users have a Naver account (from using its popular email/map services) that is integrated to NPay, users can skip authentication and ID creation. Naver's simple transaction

system reduces churn rate for its e-commerce business. In addition, Naver's 4% blended take rate (vs. industry's 10%) and differentiated services (80% advance payment for small merchants) creates a virtuous network effect. As a result of Naver's durable competitive advantages, its shopping division captures a 23% of $100B Korea E-Commerce market which is expected to grow $160B by 2022. Meanwhile, NPay is the #2 player (28% market share) with a long runway for growth as it taps into offline payment with Naver Reservations (NPay is 75% online vs. 25% offline).

in US$Mn unless specified otherwise	Historical		Projected				CAGR Growth		% of Total Sales	
	2017	2018	2019E	2020E	2021E	2022E	17-18	19-22E	2018	2022E
Naver E-Commerce Revenue (ad+commision)	545	783	1,027	1,335	1,684	2,117	*43.5%*	*27.3%*	*16.3%*	*28.3%*
% of Naver E-Commerce GMV	*4.9%*	*5.4%*	*5.6%*	*5.9%*	*6.1%*	*6.4%*				
Shopping related search ad sales	108	222	351	484	640	830	*106.4%*	*33.2%*	*4.6%*	*11.1%*
% of Naver E-Commerce Sales	*19.7%*	*28.4%*	*34.2%*	*36.3%*	*38.0%*	*39.2%*				
Transactional comissions	438	561	676	851	1,044	1,287	*28.1%*	*23.9%*	*11.7%*	*17.2%*
Implied shopping take-rate (blended)	*3.9%*	*3.9%*	*3.7%*	*3.8%*	*3.8%*	*3.9%*				
Naver E-Commerce GMV	11,085	14,482	18,287	22,612	27,514	33,237	*30.6%*	*22.0%*		
% of Total Korea E-Commerce GMV	*13.7%*	*14.8%*	*16.5%*	*17.9%*	*19.1%*	*20.3%*				
Total Korea E-Commerce GMV	81,039	97,712	111,116	126,357	143,690	163,400	*20.6%*	*13.7%*		
Naver Pay (online-shopping) Revene	126	200	286	385	497	595	*58.3%*	*27.7%*	*4.2%*	*7.9%*
Naver Pay (online + offline) GMV	6,175	9,761	14,007	18,919	24,476	29,412	*58.1%*	*28.1%*		
% of Total Korea E-Commerce GMV	*7.6%*	*10.0%*	*12.6%*	*15.0%*	*17.0%*	*18.0%*				
Online (Smartstore) GMV	4,563	7,322	9,816	12,731	15,910	18,235	*60.5%*	*22.9%*		
% of Naver Pay GMV	*73.9%*	*75.0%*	*70.1%*	*67.3%*	*65.0%*	*62.0%*				
Offline GMV	1,612	2,439	4,191	6,188	8,567	11,177	*51.3%*	*38.7%*		
% of Naver Pay GMV	*26.1%*	*25.0%*	*29.9%*	*32.7%*	*35.0%*	*38.0%*				
LINE Pay Revenue	18	60	152	287	475	775	*238.8%*	*72.2%*	*1.2%*	*10.3%*
LINE Pay GMV	4,398	9,932	18,971	31,871	47,488	64,584	*125.8%*	*50.4%*		

Note: These figures are not disclosed. These are my estimates from my primary research.

2. LINE Pay will breakeven in 5 years and Japan fintech industry will rationalize for profitability as growth reaches more mature phase: Investors are overlooking LINE's dominant distribution (80M Japan MAUs), highest user engagement (85% Daily Active User/MAU, users spend 90 minutes per day on average in LINE), full-fledged services (credit card with Visa, investments with Nomura, loan with Mizuho), first-mover advantage, strongest partnerships (with WeChat Pay, Quic/Mercari Pay), and established merchant base (1.4M stores accept LINE QR code payments). As LINE pay beat Apple Pay in becoming the largest mobile payment service provider in Tawan with 22% market share, LINE pay will also prevail against rivals in Japan. Once the industry evolves from fragmented to consolidation and user behavior (in using LINE Pay) is well established, LINE can reduce its costly customer acquisition. LINE's new food delivery, travel booking, and shopping businesses will grant the company with cross-sell synergy, pricing power, and long tail of growth.

Hard Catalyst

1. LINE Pay's spin-off will unlock value: Korean conglomerate has engaged in multiple spin-offs (notably game developer NHN) to reduce portfolio complexity and highlight the disconnect between valuation and Naver core's quality. I think the company may do the same with LINE Pay. Investors, who were reluctant to own Naver because of the difficulty in forecasting fintech business segment, will buy Naver to capture its substantial discount. As a standalone public entity, LINE Pay would have dedicated management, capital structure, and fintech investors with an appreciation of growth profile. The shareholders would gain assets benefiting from multi-year tailwinds. I have incorporated the company's spin-off prediction in my high case scenario with only 10% probability.

Risks

1. Corporate governance issues: Naver had Mirae Asset Daewoo formed a partnership via stock swap (1.7% of Naver's treasury shares for 7.1% ownership), making the tech giant the fourth-largest shareholder of a $4B brokerage firm. Moreover, Naver acquired LINE's 2.5M new shares and 50% of convertible offerings. To reflect investors' concerns on Naver's seemingly de-emphasis of shareholder creation, I applied a very conservative 20% conglomerate discount in my valuation. However, it is worth noting that these types of transactions are not uncommon practice in Asia. Moreover, there is some synergy with the alliance – Naver VC fund, partnered with Mirae, has made investments that could be worth a lot in the future (0.8% stake of $14B ride hailing Grab and 2.5% stake of $1B Indonesian e-commerce Bukalapak).

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2. YouTube's dominance in video ads: While the trend is disturbing, video ads only constitute 8% of digital ads (10% Naver's ad sales) and Naver is transforming Naver TV into an open platform with more attractive compensation system for content creators. Since viewers are on multiple platforms (82% on YouTube vs. 43% on Naver TV vs. 26% on Facebook), 'micro-influencers' and ad agencies have a vested interest in supporting Naver TV as well.

Valuation

At 9x P/E 2020E, Naver core business trades at a deep discount to peers exposed to similar trends: Netting out net cash ($7.8/sh), treasury shares ($11/sh), LINE equity stakes and convertible ($24.3/sh), investments ex-LINE ($10.3), the core (search+shopping) business is only trading for $43.7/sh ($7B). This is very cheap (9x P/E 2020E). For reference, search peers (Yandex, Google, Yahoo Japan, Baidu) are trading at 14.1x (P/E ex-cash 2020E) and shopping peers (Alibaba, eBay, Rakuten, and JD) are trading at 25.4x (P/E ex-cash 2020E). Naver indeed grows at a lower rate with 18% sales CAGR (vs. 23% search/shopping peers) in a smaller market. However, considering that Naver core has 37% EBIT margin (as a more profitable third-party shopping platform rather than peers' direct retailer models) and higher local ad market share (74% Naver vs. 38% peers), Naver's 50% discount is unwarranted.

In US $Mn	Valuation Method	Metrics	Multiple	Value	Naver Stake	Value to Naver	$/share	as % of Total	Comments
Naver Core (search/ads+shopping+pay)	P/E ex-cash	$1,147	14.1x	$16,173	100%	$16,173	$98.14	73.5%	Blended average multiple (46% search/ads, 33% e-commerce, 18% pay)
LINE (messenger/ads+pay+entertainment)	P/S	$2,531	3.2x	$8,099	73%	$5,912	$35.88	26.9%	Blended average multiple (52% messenger/ads, 21% entertainment, 15% pay)
LINE 0% Convertibles	Market Value			$1,225	50%	$613	$3.72	2.8%	In Sep 2018, Naver bought 2 cvts (Sep 2025 trading at 90 and Sep 2023 trading at 94)
VC Investments (excl. LINE)	Market Value			$1,173	100%	$1,173	$7.12	5.3%	$80M stake in $10B Grab (ride-hailing), $25M in $1B Bukalapak (Indonesian e-commerce)
Net Cash	Market Value			$1,291	100%	$1,291	$7.83	5.9%	currently Naver has net cash of $1.2B
Naver's treasury shares	Market Value			$1,810	100%	$1,810	$10.98	8.2%	In Korea, treasury shares are utilized for future growth strategies (strategic alliance)
Mirae Asset Daewoo equity stakes	Market Value			$4,592	7%	$326	$1.98	1.5%	Partnership through $419M stock swaps. Naver is the 4th largest owner of the brokerage firm
Snow *(Snapchat)*	Market Value	--	--	$250	82%	$205	$1.24	0.9%	Financing round in Jan 2018 (SoftBank and Sequoia) valued it at US$250M
Market Cap and Target Price						$22,002	$133.51		
Conglomerate Discount		20%							

I used SoTP to capture the value of Naver's divergent businesses and because Naver has done numerous spin-offs, partly to surface the value of the underlying companies: I applied 3.2x EV/Sales on 2022E on 2022E LINE sales of $2.5B (11% sales growth CAGR). For Naver core, I applied a 14.1x P/E ex-cash. These multiples are calculated based on justified multiples and relative to peers, with a conservative bias. I derived my target price of $123 (or 27% probability weighted IRR) when I add together Naver core's 2022E value ($98.14) and other parts of the business (even cash) in current market value.

2.4x Risk/Reward, 25% IRR (46% absolute return) Short – FIVE

	FIVE share price	Weight
As of 8/16/22	$138.11	
1 Yr Price Target	**$94.94**	
% Return	*45.5%*	
IRR	**24.5%**	
DCF	$37.77	20%
Past M&As, LBOs	$99.14	10%
Public Comps	$99.32	10%
EBITDAx 23E	$112.57	60%

	Bear	Base	Bull
Probability	20%	45%	35%
Key Events	Industry tailwinds persist, management exceutes, share repo, activist HF takes equity stake, LBO/M&A tail-risk	Derailing from its differentiation winning strategy strips its appeal to key customers & contends with new competitors that have scale advantage	Market saturation results in pricing war & lower new/same store sales. Costs of growth & supply chain ownership leads to ROIC decline and margin compression
# of Stores '23	**1,630**	**1,600**	**1,590**
Same Store Sales '23	4.5%	4.0%	-1.00%
Comp Sales	$2,570M	$2,557M	$2,434M
New Stores Opened	300	270	260
Rev per New Store '23	$7,500	$7,000	$6,000
New Store Sales	$2,250M	$1,890M	$1,560M
Total Sales '23	**$4,820M**	**$4,447M**	**$3,994M**
EBIT Margin '23	14.0%	11.6%	10.0%
EBIT	$675M	$514M	$399M
EBITDAx	**15.0x**	**13.5x**	**12.0x**
Ent. Val	**$12,108M**	**$8,725M**	**$6,383M**
Mkt. Cap	$9,812M	$6,428M	$4,086M
Target Price	**$175.73**	**$115.13**	**$73.19**
Delta	*27.2%*	*-16.6%*	*-47.0%*
Prob. weighted TP		**$112.57**	
Delta		*-18.5%*	
Risk/Reward		**2.4x**	

US Retail Industry Description

The blurring of boundaries between the dollar store industry, drugstores, and big-box retailers will lead to the fierce competition: FIVE Below (FIVE) contends with dominant players in the oligopoly dollar & variety subsector– Dollar General (DG), Dollar Tree (DLTR), and FIVE have 35%, 26%, and 0.3% market share respectively. FIVE was able to grow because the incumbents focused on their respective customer segments with variant price points across disparate geographical areas – DLTR went after middle-income families in suburban areas who are looking for cut-price items to complement a shopping trip, DG served low-income rural residents, FDO attracted bargain seekers in urban areas while FIVE allured adolescents by monetizing popular teen trends (fashion/accessories) and offering unique priced-range items (not as cheap as DLTR/DG/FDO's items but more affordable than shopping at WMT/TGT).

	Presence			
	Median Income	Price Point	Population	Strategy
FDO	$59,535	$0.75	12.5M	Urban
DLTR	$62,520	$1.25	13.7M	Suburban. Middle-income Family
FDO+DLTR	**$60,998**	**$1.10**	**13.1M**	**Suburban + Urban**
DG	**$58,023**	**$1.00**	**11.0M**	**Rural. Low income (<$40k)**
FIVE	**$63,439**	**$4.50**	**14.7M**	**Semi-rural. Teens**
'25 Goals	$65,360	$8.00	2.3M	Subruban + Urban

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But as the market is getting saturated, DG has been moving upmarket by opening smaller-format stores called DGX. Concurrently, DLTR has been increasing its price to $1.25 in Q421 and expanded its Dollar Tree Plus concept, which sells products at a range of price points up to $5. Their foray into FIVE's turf is highly troubling for FIVE in numerous ways given their unparalleled scale – stronger bargaining power over their suppliers keeps their items cheaper, bigger supply chain expedites their shipping & cheaper, more # of stores (17x that of FIVE's) offer closeness/convenience, greater data advantage to monetize on, and more financial resources to navigate industry trends.

Intensifying what is already a hypercompetitive environment, the big-box retailers (WMT and Costco) have also been expanding with small-format stores to take away shoppers who are seeking convenience and a faster shopping experience ($ Store's key customer segments). While FIVE's bulls may claim that these developments have already been occurring over many years, I believe we're only at the early innings of a multi-year period of pricing war as even the drugstores (Walgreen, CVS, Rite Aid) and supermarkets (Kroger, Albertson, Aldi) will be competing over similar customers.

Business Description

Promotional management with lofty goals: Although FIVE leadership promised strong Q222 guidance on its investor day, the company printed results that were way off. They've underestimated the impact of the COVID stimulus, tax returns, and child tax credit. Granted, other retailers have also had disappointing earnings, and Q1 was a particularly volatile and uncertain period. However, there are many additional red flags that weigh on my negative assessment of FIVE's leadership.

For instance, the co-founder and current chairman, Tom Vellios, doesn't seem to advocate an optimal capital structure that would enhance shareholder returns. FIVE's peers' net debt leverage is 4.1x vs. FIVE's 1.6x (both include LT capital lease obligations). Even when highly leveraged BIG is excluded, the average ratio is 2.9x. I suspect Tom's reluctance to borrow more debt to do more share buybacks is due to his previous bankruptcy trauma (Zany Brainy, his previous retailer, sold children's products). Although FIVE's proponents may regard it as sound risk management, I disagree because FIVE's 19% premium for its forward EBITDAx vs. comps is largely attributed to its higher sales growth (15% vs. comps' 6% 3-year rev CAGR forecast) and the company could incur more debt to grow faster or return capital to shareholders without alarming leverage.

	Net Debt Leverage	SI % of Float
DG	2.7x	1.8%
DLTR	3.2x	2.5%
DOL CN	2.7x	0.1%
BIG	7.9x	35.5%
Avg	**4.1x**	**10.0%**
FIVE	1.6x	9.8%

		Delta between Sean vs. Mgmt Guidance	Delta between Sean vs. Sell-Side Consensus	Sean	Mgmt Guidance	Sell-Side Consensus
20/20 Vision (LT Plan)	**# of Stores by 2030**	**-0.9%**	-2.8%	**3,470**	**3,500**	3,570
	YoY Increase '21-'30	-1.3%	-4.2%	253	257	264
	Total Sales by 2025	-14.7%	-8.1%	**$4.8B**	**$5.6B**	$5.2B
	CAGR from '21 to '25	-25.8%	-15.0%	13.8%	*18.6%*	*16.2%*
	YoY SSS from '23-'25	-5.0%	0.0%	**3.8%**	**4.0%**	**3.8%**
	EBIT Margin by 2025	-11.4%	-2.7%	**12.4%**	***14.0%***	**12.7%**
	Diluted EPS by 2025	-22.2%	-12.7%	$7.78	$10.00	$8.91
2Q22	# of Stores	0.0%	0.0%	1,255	1,255	1,255
	Sales	**-1.0%**	**-0.8%**	**$678M**	**$685M**	**$684M**
	Same Store Sales	-90 bps	-10 bps	-4.4%	-3.5%	-4.3%
	EBIT Margin	-13 bps	-7 bps	**8.7%**	**8.8%**	**8.8%**
	Diluted EPS	-8.2%	-8.2%	$0.73	$0.80	$0.80
FY22	# of Stores	-1.5%	6.0%	1,330	1,350	**1,255**
	Sales	**-1.2%**	**-1.3%**	**$3,044M**	**$3,080M**	**$3,083M**
	Same Store Sales	273.0%	-13.3%	-3.7%	-1.0%	-4.3%
	EBIT Margin	**-5.3%**	**-3.2%**	**11.6%**	**12.2%**	**11.9%**
	Diluted EPS	-9.9%	-10.5%	$4.55	$5.05	$5.08

Investment Thesis

1. "Five Beyond" derails its winning strategy: FIVE is dramatically shifting from its differentiation positioning by introducing higher price points and serving more various diverse age/income demographics. I believe this would invite a new set of bigger competitors and a wide array of challenges. There are numerous case studies that strengthen my conviction. 1) DLTR reported a $2.7B goodwill impairment charge in 2019 against the value of FDO because serving 2 what seemed similar sets of customers has proven to be more difficult task. Due to minimal product lap, DLTR suffered from markdowns, higher inventory costs, and out-of-stocks (as there are more trends to analyze for an increased # of seasonal items). 2) Big Lots (BIG), once a popular closeout retailer faced a negative response from its consumers to its electronics/accessories offerings. I'll acknowledge that Dollarma (DOL CN) was an exception as it was able to successfully move upmarket despite the short sellers' accusations (Spruce Point). However, the only reason why DOL was able to do so is because it's a monopoly in a less competitive Canadian market (72% market share which is 5.5x that of 2nd biggest player).

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Prototype	Yr Introduced	Store Layout	Store Size	% of Chain ('21)	Value Proposition
Vintage	2008	Easy-In, Easy-Out	7,000 sqft	30%	Safe zone attracted to parents
Fresh	2017	One way in, one way out	8,500 sqft	40%	Fun interactive experience to teenagers
Beyond	2020	Easy-in Sticky Out	9,000 sqft	30%	Loses its differentiation

Management's losing proposition doesn't end here. So far, FIVE has designed a floor layout with an easy-to-navigate flow, differentiating itself from Target's "easy-in, sticky out" approach and capturing customers who want to identify and buy their items easily By announcing to renovate many of its existing stores and open bigger store size with a more complex layout, FIVE will lose many of its customers who wanted quick shopping experience. The leadership also talked about evolving their company from consumer discretionary to staples. This requires a new business model and I believe they are underestimating the complexity of such a transition.

2. Bulls and FIVE Mgmt. are underestimating the additional cost of operating a large-scale business: By investing in its own fleet (buying trucks) and owning the supply chain, FIVE is abandoning the cost savings it enjoyed from having vendors ship (streamline & reduce packing) 15% of its merchandise for its retail stores – not to mention how expensive this endeavor would be. Moreover, FIVE's bulls have been overlooking the factthat maintaining the same high quality while operating at a large scale has proven to be notoriously difficult. For instance, before the merger, FDO's sales sputtered when it reached a scale, hurt by neglected stores, poor product selection and unhappy workers. These challenges of overseeing a large # of stores can't be solely attributed to FDO's leadership because even under DLTR, FDO had to close 400+ stores in Feb 2022 after discovering unsanitary conditions at its distribution center. Moreover, As FIVE evolves from a northeast regional player to a national one, it will also no longer be "nimble," making it more difficult to stay relevant with unpredictable/volatile teenager trends and, therefore, losing what was a key driver of its success.

	# of					as % of Sales			Sales					% of		Employee	Buy SKUs from	
	Distribution Centers	Stores	US States	Pop. Growth YOY	Density	COGS	SG&A	EBIT	2021	3 Yr CAGR ('22-'25)	per Store	Pop./ Store	Store/ DC	Inventory from its DC	# of Employees	per Store	Domestic	Import
FDO	11	8,186	48	0.7%	222	--	--	--	--	--	--	1,525x	744x	--	--	--	--	--
DLTR	15	7,871	48	0.6%	259	--	--	--	--	--	--	1,738x	525x	--	--	--	--	--
FDO+DLTR	**17**	**16,057**	**48**	**0.7%**	**240**	**44%**	**33%**	**8%**	**$27.0 B**	**6.0%**	**$1,682 M**	**814x**	**945x**	**90%**	**211k**	**13**	**58%**	**42%**
DG	**12**	**18,190**	**47**	**0.6%**	**196**	**69%**	**22%**	**9%**	**$34.0 B**	**7.6%**	**$1,869 M**	**607x**	**1,516x**	--	**163k**	**9**	--	--
FIVE	**2**	**1,225**	**40**	**0.7%**	**299**	**64%**	**23%**	**13.3%**	**$3.0 B**	**18.6%**	**$2,449 M**	**12,016x**	**613x**	**80%**	**40k**	**33**	--	--
'25 Goals	0	1,000	8	1.0%	32	--	--	14%	$2.6 B	18.6%	$2,600 M	2,276x	--	100%	--	--	50%	50%

My primary research and fundamental analyses indicate that for FIVE to deliver on its promises, 1 distribution center (mgmt. announced it would no longer build new DCs in the near time) would have to support 1,113 stores (currently, the ratio is 613 stores/DC) and penetrate 8 new states (DC, Idaho, Montana, North and South Dakota, Oregon, Vermont, Washington and Wyoming) that have significantly lower population density (32 people per square mile from that of its existing 299). These imply that (esp. to deliver a similar time delivery and customer experience) FIVE's spending growth on new fleets, drivers, DC employees, and shipping costs would far outpace the incremental revenue growth from these new stores. Thus, FIVE management's vision to triple its store base by 2030 while doubling its both top and bottom line by 2025 raises a lot of skepticism as to whether the company could maintain its margin at the same rate as it grows its revenue.

3. FIVE can't compete with DLTR & DG with its 17x smaller # of stores: According to Statista's survey of 2k respondents, the factors that motivate consumers to shop at $ stores are #1 price (72%) and #2 convenience (53%). If FIVE's unique appeal to teens declines with dramatic deviance from its winning strategy, as I predicted, FIVE would have to increasingly compete more on these value propositions. However, FIVE is significantly disadvantaged in these areas – its price points are higher than its direct competitors and new stores would be farther from the new customers compared to DG & DLTR (as FIVE has to penetrate new markets where they don't have as high store density. In addition, DG's store locations are within 5 miles of 75% of the US population.

Risk

	Date	Buyer	Target	Transaction Value	Trailing EBITDAx	Stock Price Premium	# of Stores as of deal date	Implied Price for Each Store
M&A and LBOs	3/12/2007	KKR	DG	$7,291 M	16.2x	31%	8,260	$883 K
	10/11/2011	Ares, CPPIB	99 Cents Only Stores	$1,600 M	11.0x	32%	289	$5,536 K
	7/23/2012	BC LP	FDO	$9,200 M	11.3x	23%	8,100	$1,136 K
			Avg	$6,030 M	12.8x	29%	5,550	$2,518 K

	Date	Activist HF	Target	Equity Stake	Stock Price Reaction	Result
	7/28/2010	Nelson Peltz	FDO	6.6%	6.9%	failed to
	6/9/2014	Carl Icahn	FDO	9.4%	13.4%	Forced it to merge with DLTR
	1/7/2019	Starboard Value	DLTR	1.7%	5.5%	Failed in pushing it to sell FDO

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1. M&A/LBO Tail Risk given the sector's history with Activist HFs and PEs: FIVE, which doesn't have debt, makes it more likely to be a takeover candidate if share prices fall. Even if management refuses the buyout offer, it can be approached by activist HFs like in the past. On the flip side, activists' focus on the sector also plays in my favor in numerous ways. When Spruce Point issued a short report on DOL CN, the stock plummeted by 40% (this is in spite of the fact that many of their allegations have turned out to be wrong, with the stock now up 1.5x. The shares' fall persisted 3 months). Furthermore, one vital reason why Blockbuster, which deployed interactive/fun prototypes for its stores and got into gaming to fend off Netflix (do these strategies remind you of FIVE? Although the business models and industry dynamics of video rental and dollar stores are different, one can find many similar missteps between FIVE is making and what Blockbuster has made), failed is because Icahn distracted the management's focus away from turning around the business. Moreover, dollar & variety store stocks already have a large base of investors that are betting on other activists to launch their campaigns. This implies that a considerable amount of transaction tail-risk has been priced into FIVE's shares. I can also mitigate the takeout tail-risk by monitoring signposts (as my analysis show, I will cover my shorts as FIVE's EBITDAx gets closer to 11.5x, at which the company becomes an attractive target.

	Implied Enterprise Value	Transaction Multiple that FIVE can be bought	Implied Market Cap	Implied Stock Price
FIVE	$7,556 M	11.5x	$5,536 M	$98.31

Valuation

	Mkt Share	Sales	Sales ('22-'25) 3yr CAGR	Gross Margin	Mkt Cap	Ent Val	Forward P/E Now	Forward P/E vs. 5yr avg	Forward EBITDAx Now	Forward EBITDAx vs. 5yr avg	FCF Yield	ROIC	Net Debt Leverage	SI % of Float
DG	34.6%	$34B	7.6%	31.2%	$57.5B	$72.1B	20.7x	7%	14.2x	11%	2.7%	9.6%	2.7x	1.8%
DLTR	26.3%	$27B	6.0%	30.3%	$37.0B	$46.2B	18.5x	7%	11.3x	9%	1.0%	6.8%	3.2x	2.5%
DOL CN	72%*	$4B	9.1%	43.8%	$18.0B	$26.9B	27.3x	18%	17.4x	6%	3.3%	18.8%	2.7x	0.1%
BIG	6.3%	$6B	0.5%	38.1%	$0.7B	$2.7B	*39.8x*	*358%*	*5.5x*	*29%*	-55.4%	2.1%	7.9x	35.5%
Avg		**$18B**	**5.8%**	**35.9%**	**$28.3B**	**$37.0B**	***26.6x***	***98%***	***14.3x***	***14%***	**-12.1%**	**9.3%**	**4.1x**	**10.0%**
FIVE	**0.3%**	$3B	15.3%	32.3%	$7.7B	$8.8B	25.0x	-29%	17.0x	-28%	0.4%	12.5%	1.6x	9.8%

in $K, except per-share data	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E
EBIT	**351,625**	**511,457**	**576,655**	**592,386**	**590,847**	**589,517**	**588,387**	**587,445**	**586,681**
Less: Taxes	(84,612)	(124,570)	(140,869)	(144,802)	(144,418)	(144,085)	(143,802)	(143,567)	(143,376)
Add: D&A	90,644	132,456	137,394	142,280	143,064	143,912	144,823	145,796	146,830
Less: CapEx	(234,539)	(460,350)	(478,800)	(497,350)	(481,600)	(465,750)	(449,800)	(433,750)	(417,600)
Less: Increase in WC	295,995	226,311	(74,407)	19,654	(38,818)	(9,087)	(9,037)	(8,989)	(8,944)
Unlevered FCF	**419,112**	**285,304**	**19,972**	**112,167**	**69,076**	**114,508**	**130,570**	**146,935**	**163,591**
Discount Period		0.5	2	3	4	5	6	7	8
Discount Factor		0.97	0.89	0.84	0.79	0.74	0.70	0.66	0.62
PV		276,877	17,715	93,699	54,345	84,844	91,115	96,566	101,256
PV of CFs	816,416								
PV of TV	1,417,578								
Total Ent Val	2,233,993								
Cash '23	551,737								
Debt	677,042								
Equity Val	2,108,688								
Equity Val/Share	$37.77								
NOPAT	267,013	386,887	435,785	447,583	446,430	445,432	444,584	443,878	443,305
Equity	1,374,120	1,747,830	2,170,438	2,604,844	3,038,097	3,470,352	3,901,760	4,332,460	4,762,588
Debt	1,736,910	2,334,385	3,085,457	3,880,308	4,654,579	5,411,879	6,152,402	6,876,337	7,583,867
Invested Capital	3,111,030	4,082,214	5,255,895	6,485,152	7,692,676	8,882,231	10,054,162	11,208,797	12,346,455
ROIC	8.6%	9.5%	8.3%	6.9%	5.8%	5.0%	4.4%	4.0%	3.6%

Assumptions	
Cost of Debt	3.80%
Risk Free Rate	3.00%
Market Risk Premium	4.50%
Beta	1.20
Cost of Equity	8.4%
Terminal EBITDAx	14.0x
Debt / Total Capital	40.0%
ETR	25.0%
WACC	**6.18%**

FIVE's bulls could refer to EBITDAx is trading at -28% vs. its 5yr average to argue that a lot of my negative assessment of the company has been baked into the stock and that mean reversion is likely to happen. However, I beg to differ because of FIVE's dramatic shift in its strategy (moving upmarket, higher income customers away from teens) and new competition intensity signal huge future downside. Thus, I only weighed 10% of my valuation on public comps. As for DCF, I used conservative assumptions (high terminal multiple, lower WACC). But FIVE's DCF analysis indicates that its stock is highly overvalued. As another conservative way, I only weighted 20% of my valuation from DCF.

Outstanding diligence items and methods to address them

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First, use commonly utilized Expert Networks and 3rd Party Data: For instance, I'd employ credit card data and POS Systems to assess brand loyalty and repeat purchases, satellite images of store parking lots to assess foot traffic which would be critical to tease out same-store sales growth vs. basket size, and employee satisfaction surveys to analyze company culture and employee retention/wage forecast. This process would primarily help me understand what investors are pricing into the stock.

Then, conduct primary research in collaboration with investigative journalists: We'd utilize untapped sources (interviewing ex-drivers/distribution center workers) to validate/refute management's remarks ("expansion capability of 1M+ sqft from its existing distribution centers" and "center network can service 2K+ stores", "servicing most of our stores in 1 to 2 days") and to gain better visibility on FIVE's future shipping rates, delivery time, and operational efficiency.

Also, work with data scientists: We'd procure, mine and synthesize the prices of all FIVE's 4K SKUs and store density/penetration to compare its average price and distance analysis with those of its competitors. Moreover, we'd use web scraping to monitor customer sentiment, compare FIVE's marketing KPIs with that of its competitors to quantify brand awareness and forecast customer acquisition cost, and better predict the e-commerce penetration and contribution to the overall business. With obtained predictive customer metrics, I'll deploy differentiated fundamental analyses such as Conjoint Analysis to assess customers' price sensitivity to assess FIVE's pricing power and predict FIVE's success of moving upmarket (introducing higher price points), forecast market shares, and rank what attributes people value the most in selecting FIVE vs. competitors. I'd also use Customer Cohort Analysis to understand its quality of growth spending and unconventional valuation methodology, Customer-Based Company Valuation, to not only forecast revenue more precisely but also pinpoint where the value creation is coming from.

Sean Lee | seanlee21@gsb.columbia.edu | 347-640-0930

KMW (KS032500) – Long (Prob-weighted IRR 21%, 2 year target, Upside: +29%)

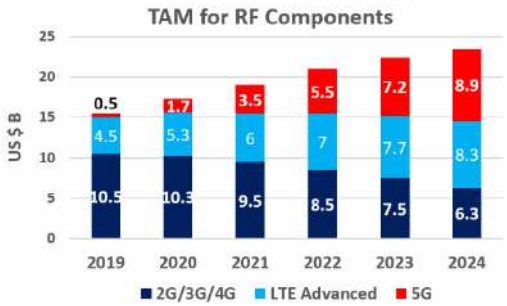
Summary: KMW, a leading Korean telecommunications equipment manufacturer, is in the early innings of a 10-year upward cycle in 5G base station capital spending by global telecom operators. The street hasn't yet been able to apply the right frameworks to accurately analyze the impact of new generation network on KMW with its stock trading at 9x P/E (2020E). Moreover, KMW has structural competitive advantages that the market doesn't fully appreciate yet.

	Low	Base	High
Revenue CAGR through 2024	7.0%	18.2%	31.7%
Revenue (2022)	1,313	1,750	3,420
EBIT Margin (2022)	9.2%	20.3%	24.7%
NI (2022)	104	297	474
Forward P/E (2021)	7.0x	10.0x	13.0x
Market Cap (in KRW B)	726	2,967	6,157
TP (KRW	18,246	74,548	154,695
Upside/(downside)	*-64%*	*47%*	*205%*
Probability of Likelihood	30%	50%	20%
Prob. Weighted TP (KRW)	5,474	37,274	30,939
Weighted Avg. TP (KRW)		73,687	
Upside/(downside)		45.3%	
Prob. Weighted IRR		20.6%	

KMW	12/16/19
Share Price (KRW)	50,700
Trading/Reporting Currency	KRW
52-week Low	9,775
52-week high	77,700
Shares (M)	39.8
Market Cap (KRW B)	**2,018**
- Cash & Equivalents	37.7
+ Preferred & Other	-0.5
+ Total Debt	111.5
Net Debt (KRW B)	73
Enterprise Value (KRW B)	**2,091**
Dividend Yield	0.0%
Free Float %	56.5%
$ADTV (KRW B, 6mths)	22
Insider Ownership	31.1%
SI as % of Float	12%
Foreign Ownership	14%
EV/EBITDA (forward)	7.2x
P/E (forward)	**8.6x**

Industry and Company Description:

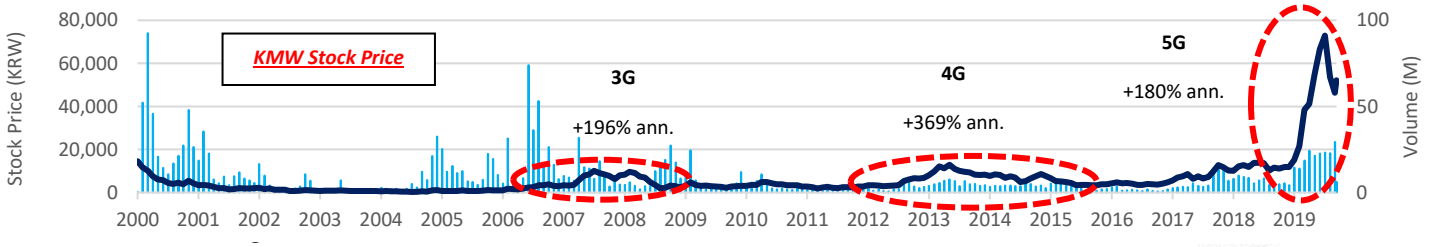
Secular tailwind in fragmented $24B Radio Frequency (RF) components market: Founded in 1991, KMW develops, manufactures, and sells telecom components (RF) used in base stations installed by system integrators such as Nokia (65% of revenue), Samsung (14%), ZTE (11%), and AT&T (3%). These telecom equipment manufacturers, in turn, secure deals from global mobile operators to cover their network deployments. As a result, the primary growth driver of RF market is mobile data traffic as it dictates operators' need to increase infrastructure investments to cope with growing traffic. With the industry experts estimating data traffic to grow at 30% CAGR through 2025 and 5G capex to amount $975B over a decade, KMW is well positioned to capture the unprecedented demand in RF as the second largest incumbents (3.6% global market share behind Qorvo's 20%. Considering that Qorvo is 70% cellular RF and 30% infra RF— the segment in which KMW operates, and because these companies have disparate product offerings, KMW's market share is substantially understated).



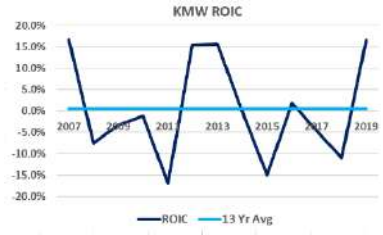
Why the opportunity exists (including what the bears say):

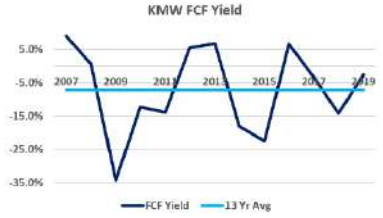
Under-covered: As of March 2019, KMW was a $462M market cap company with its stock trading flat for 18 years. Once it started recognizing revenue from 5G, the stock jumped 7x. Although some sell-side recently initiated coverage, their depth of knowledge on the company and industry is limited. Moreover, KMW and many of its peers don't have IR teams, and data on these companies are insufficient and require validation (many of them are speculations). Thus, I believe it's hard to make an inference on the consensus #s (the stock fell by 14% on Nov 4, 2019 primarily due to its EBIT of KRW 58B was below the consensus KRW 64B).

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Short interest is 12% of float (Bloomberg #s is wrong. I confirmed the # with my sell-side contacts in Asia): The sentiment is driven by the thesis that the recent peak is a cyclical short opportunity. The short sellers believe 5G capex cycle will again be ~6 years, like previous boom/bust network capex cycles. Given that many of KMW's major shareholders are passive and quant investors, it could be another reason why some investors are shorting the stock.





Concentrated customer base: KMW is an exclusive supplier of 5G Multiple Input Multiple Output (MIMO) Radio (MMR), a critical and difficult-to-make component of 5G base station, to Nokia after co-developing the technology. As a large vendor of Korean operators, Nokia contributed 65% of KMW's revenue. However, when Nokia's stock tanked 30% on Oct 24, 2019 due to margin pressure and concerns that Ericsson started a price war, KMW's share fell 20%. Moreover, investors question whether KMW's MMR success in Korea can be replicated abroad.

Investment Thesis (areas that I disagree with bear):

1. 5G and KMW command new frameworks: Unlike the short-sellers, I predict softer 5G capex hikes in the first two years but a slower capex down-cycle (vs. steeper capex decline over 6 years of previous generations) across the 10-year forecast period. My disparate outlook is supported by rigorous analysis of research papers (operators' capacity outlook).

As the frequency increases for 5G, the signal can't travel longer distances, so less area is covered by each base station (5G 100M radius vs. 4G 300M radius). As a result, the experts estimate that the new generation would require up to 9x more base stations than 4G. Moreover, 5G massive MIMO technology features 32~128 RF transceivers (antennas) and each requires a filter. Given that traditional cavity filter was too heavy, KMW developed Micro Bellows Filter, a subminiature cavity filter.

System	2G GSM/CDMA	3G WCDMA	4G LTE	4G TD LTE	5G	5G
# of MIMO	1x2	2x2 2x4	4x4	8x8	32x32	64x64
# of Filter	3	4 or 6	4 or 8	8	32	64
Filter Size (l) (1T1R)	2.99 (900MHz)	1.65 (2.1GHz)	1.19 (2.6GHz)	0.87 (2.6GHz)	0.05 (3.5GHz)	0.05 (3.5GHz)

Thus, the Korean company will not only receive a surge in demands of 4x~16x # of MBFs, but also charge higher price for these proprietary MBF as well as for being able to mass produce them without deteriorating its high quality. Currently, the industry is unable to keep up with the demand, suggesting that the Company retains a greater pricing power. Considering that it will probably, however, be commoditized, I modeled the current price of US$14 MBF to decline to $10 by 2024, which translates into ~US$640 per system, based on 64T64R.

Furthermore, many of 5G RF equipment are sold at 7x higher prices than that of 4G RF devices. Notably, Remote Radio Antenna (RRA) is 20% more expensive than MMR (even considering that MMR is fetching at US$6,100, compared to $2,030 last year). KMW is projected to supply RRA to Rakuten in 1H2020 and the CEO believes it will be one of the most selling products. While the CEO has 28 years of industry experience as the founder and retains majority of his wealth via KMW shares (31% ownership), he has a reputation for being wildly promotional.

I didn't base my optimistic projection on RRA sales on CEO's claims. Instead, I was able to have conviction with experts' remarks that RRA reduces installation cost and maintenance capex for mobile equipment vendors. During a time in which the system integrators are pressured with mounting costs, RRA's value proposition is real. Given the favorable backdrop, I believe KMW is primed for a short squeeze. I projected # of base stations for each of KMW's key markets and used them to project volume of its key products. Using my analysis on the pricing trends, I then projected revenue by each business segment and added them to model my revenues.

in KRW B except # of units and	Historical					Projected						% CAGR		Comments / LT Targets
unit price	2,014	2,015	2,016	2,017	2,018	2019E	2020E	2021E	2022E	2023E	2024E	13-18	19-24	
RF Revenue	194	190	170	172	267	843	1,108	1,444	1,750	1,946	1,993	6.6%	18.8%	RF filter industry on average is expected to growt
% of total revenue	*91.9%*	*86.2%*	*80.8%*	*84.5%*	*90.0%*	*97.6%*	*98.1%*	*99.0%*	*100.0%*	*100.0%*	*100.0%*	--	--	--
% of TAM	*2.8%*	*2.1%*	*1.4%*	*1.1%*	*1.7%*	*4.6%*	*5.4%*	*6.4%*	*7.0%*	*7.2%*	*7.0%*	--	--	5G requires 9x more base stations than 4G
System (RRA, MMR, O-RAN RU, RRH)	42	50	41	27	41	580	811	1,081	1,324	1,482	1,502	-0.7%	21.0%	Japan's # of base stations expect to grow at 106% through 2024
as % of total revenue	*19.9%*	*22.7%*	*19.5%*	*13.1%*	*13.7%*	*67.1%*	*72.9%*	*74.8%*	*75.6%*	*76.1%*	*75.4%*	--	--	--
Volume (in K)	15	18	15	11	17	80	116	160	203	236	248	19%	25.4%	Australia's # of base stations expect to grow at 71% through 2024
Avg Selling Price *(in KRW K)*	2,744	2,745	2,701	2,458	2,415	7,245	6,991	6,747	6,511	6,283	6,063	-2.5%	-3.5%	RRA is 20% more expensive than MMR
Site Solution (Antenna, RTS)	50	17	24	49	85	84	113	146	180	211	237	11.0%	22.9%	Korea's # of base stations expect to grow at 30% through 2024
as % of total revenue	*23.9%*	*7.6%*	*11.4%*	*24.1%*	*28.7%*	*9.8%*	*10.0%*	*10.0%*	*10.3%*	*10.9%*	*11.9%*	--	--	--
% of TAM	*3.1%*	*0.8%*	*0.8%*	*1.3%*	*2.2%*	*1.9%*	*2.3%*	*2.7%*	*3.0%*	*3.3%*	*3.5%*	--	--	--
Volume (in K)	37	11	11	21	41	80	96	111	122	128	128	2.1%	9.8%	RTS lowers installation costs for suppliers. Superior value proposition
Avg Selling Price *(in KRW K)*	1,364	1,557	2,198	2,315	2,073	1,052	1,178	1,320	1,478	1,655	1,854	8.7%	12.0%	--
Filter (MBF, Black Hole, Bellows)	102	123	105	96	141	158	183	218	246	252	254	6.8%	10.0%	China's # of base stations expect to grow at 78% through 2024
as % of total revenue	*48.1%*	*55.9%*	*49.9%*	*47.3%*	*47.6%*	*18.2%*	*16.2%*	*14.9%*	*14.1%*	*13.0%*	*12.8%*	--	--	previous ceramic filters = cheaper, but MBF is pricer, given the value prop
% of TAM	*3.4%*	*3.1%*	*2.0%*	*1.4%*	*2.0%*	*1.9%*	*2.0%*	*2.2%*	*2.2%*	*2.1%*	*2.0%*	--	--	--
Volume (in K)	8,494	10,826	10,984	11,513	19,666	9,428	12,256	15,197	17,933	20,085	21,290	18.3%	17.7%	--
Avg Selling Price *(in KRW K)*	12	11	10	8	7	17	15	14	14	13	12	-9.7%	-6.5%	mgmt expects it will come down to US$10 at the mass production stage
LED (Chip)	17	30	40	32	30	21	22	15	0	0	0	12.0%	--	I think KMW will divest its operating loss LED business
as % of total revenue	*8.0%*	*13.7%*	*19.0%*	*15.5%*	*10.0%*	*2.4%*	*1.9%*	*1.0%*	*0.0%*	*0.0%*	*0.0%*	--	--	--

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2. Durable competitive advantages (economies of scale + customer captivity) position KMW to be the key beneficiary of 10-year 5G capex cycle: KMW looks like Samsung Electronics in the 1990s when it became the world's leading memory producer. Despite also operating in the tough cyclical industry (price-conscious customers), Samsung uniquely had a dual advantage (high WTP and low-cost disruptor) by differentiating itself on the reliability, ability to customize products to customer demands, efficiency, and cutting-edge products. Similarly, KMW has a product portfolio that spans every price point and customized specification. AceTech, KMW's closest Korean competitor, admitted that it will take 2 more years to create its own MMR. Meanwhile, KMW's MMR has been registered as the global standard product for Nokia. It will therefore likely be sold in countries like Australia and South Africa where product specs have not been decided and where Nokia has strong presence.

Moreover, ZTE signed an agreement with KMW to use its MBF in their MIMO devices in exchange for not offering KMW's MBF to Huawei. I think the fact that leading system integrators are competing to work with KMW to sign exclusive contracts speaks to the company's brand, reliability, and cutting-edge products. In addition, the Company's Remote Tilting Steering (RTS) service delivers a superior value proposition to system integrators by allowing operators to remotely control mobile equipment without having to hire personnel to monitor it annually. As maintenance cost of base station is a big portion of system integrator's cost, KMW makes switching and search costs higher for its customers.

After 10 years of consistent R&D spending (10% of revenue), KMW developed an Artificial Intelligence that adjust finished filters to match the requirements of different radio frequencies. KMW's scale advantage, automated manufacturing and improving efficiency will enhance unit economics and give its flywheel an early lead (lower costs -> more sales -> more inventory-> better selection-> more buyers -> more sales -> more capex -> shorter delivery times -> lower costs).

	Global	Korea				China				Japan					U.S.					Australia
% of Global Mkt Share (5G Equipment)	100%	4%				38%				7%					19%					
Est. 5G Subscribers (next 6 years in M)	2,600	38				588				87					190					
Telecom Operators	--	SK Telecom	KT	LG U+	Total	China Mobile	China Telecom	China Unicom	Total	NTT DoCoMo	KDDI	Softbank	Rakuten	Total	AT&T	Verizon	Sprint	T-Mobile	Total	Optus
5G CapEx Plan (next 10 yrs in US$B)	975	6	3	3	13.3	243	80	80	411	7.3	4.3	1.9	1.8	15.3	115	80	45	20	260	4.2
Local Market Share	--	42%	26%	20%	88%	59%	19%	20%	98%	43%	28%	25%	--	96%	34%	35%	12%	18%	99%	27%
5G release date	2Q19	2Q 19	2Q 19	2Q 19	--	4Q 19	4Q 19	2Q 19	--	3Q 20	3Q 20	1Q 20	2Q 20	--	2Q19	2Q19	2Q19	2Q19	--	2Q19
System	RF Supplier	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Huawei	Tatfook, Fingu, RFHIC	28%	12%			x	x	x	45%	--	--	71%	--	13%	--	--	--	--	--	--
Nokia	KMW, RFHIC, Tatfook	23%	25%			x	x	x	10%	21%	5%	10%	--	15%	x	x	x		--	33%
ZTE	KMW	13%	--			x	x	x	35%	--	--	9%	--	--	--	--	--	--	--	--
Ericsson	KMW, Ace Tech, RFHIC, Tatfook	27%	18%			x	x	x	10%	2%	26%	10%	--	16%	x	x	x		--	33%
Fujitsu	KMW	1%	--			--	--	--	--	38%	--	--	--	18%	--	--	--	--	--	--
NEC	--	1%	--			--	--	--	--	38%	--	--	--	18%	--	--	--	--	--	--
Samsung Electronics	KMW, AceTech, RFHIC, Seojin, WaveElectronics	3%	45%			--	--	--	--	--	69%	--	--	18%	x	x	x		--	33%

Note: highligted in yellow are telecom operators in which KMW is the main supplier via system integrator.

Catalyst:

MMR sales in Japan: KMW is co-developing MMR with Fujitsu, a leading Japanese system integrator that has extensive relationship with KMW and NTT Docomo (largest telecom operator). Given that the joint development of MMR with Nokia led to 3x surge in KMW's stock price, I will continue to monitor it actively. I only incorporated the upside of this catalyst on my high scenario.

Risks (what we could lose if we're wrong):

1. Shorter 5G capex cycle and cyclical mean reversion: On my low scenario, I assumed I am completely wrong and the stock falls back to the stock price mean reversion. While there may be fear of rising credit risk, I am confident in management's ability to cope with volatile network capex cycle. As a CEO for 28 years, Kim has carried the company through numerous cycles (2G~5G) and 3 near-bankruptcy situations. I have built 10-year historical model of the company and his track record suggests that he is relatively good at timing his company's R&D investment and capital investments to take advantage of market developments. Analyzing his 20 year of past interviews, I get the sense that he realizes, through his numerous financial turmoils, how quickly capital can dry up and that he will be more inclined to be conservative by holding onto more cash and avoiding leverage as much as possible.

Valuation

Substantial discount to its comps is unjustified: Despite having larger market share, faster revenue growth (133% YoY), low leverage (0.9x debt/EBITDA), and comparable margins, KMW is trading at 8.7x P/E 2020E while Chinese competitors are trading at 30x P/E. Considering that KMW also has strong foothold in the biggest RF market, China, through ZTE and that China has political interest to diversify its supplier mix, KMW's significant discount is unwarranted. Once the market recognizes KMW's improving ROIC and stronger fundamentals (by winning higher margin systems contracts), KMW presents an attractive opportunity to both value and growth investors. I valued KMW based on PE multiples approach.

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(US$M)	Stock Ticker	Exchange	Key Products	Equity Val	Ent Val	LTM Market Share	LTM Revenue	LTM Revenue growth YoY	LTM Gross Margin	LTM EBITDA Margin	LTM Debt/ EBITDA	LTM ROIC	2020E EV/EBITDA	2020E P/E
Ace Technologies	088800	KS	Filter (RRH) / Antenna	$216	$346	2.3%	$355	23.8%	26.9%	10.1%	4.2x	3.9%	7.0x	8.5x
Shenzhen Tat Fook Tech	300134	SZ	Frequency filter, combiner	$1,550	$1,481	2.2%	$338	22.4%	19.8%	6.9%	4.1x	3.0%	58.8x	30.4x
Fingu	002194	SZ	Amplifier, combiner, ceramic	$1,620	$1,588	1.5%	$225	29.9%	24.6%	1.9%	3.9x	10.4%	126.9x	50.6x
Direct Comps (RF Components)	--	--	--	**$1,129**	**$1,138**	**2.0%**	**$306**	**25.4%**	**23.8%**	**6.3%**	**4.1x**	**5.8%**	**64.2x**	**29.8x**
KMW	032500	KS	MBF, RRH, MMR	$1,695	$1,757	3.6%	$564	133.1%	30.9%	19.7%	0.9x	16.5%	6.0x	7.2x
Other 5G Equipment Manufurer	--	--	--	**$3,348**	**$3,481**	**6.0%**	**$925**	**49.5%**	**36.2%**	**29.7%**	**0.9x**	**8.1%**	**8.4x**	**13.6x**
Qorvo	QRVO	US	70% celluar RF, 30% infra RF	$12,042	$12,545	20.0%	$3,096	0.2%	39.5%	43.7%	0.8x	4.2%	13.0x	17.7x
OptoElectronics Solutions	138080	KS	Optical transceiver	$327	$315	1.0%	$160	150.4%	41.6%	28.8%	0.4x	1.6%	4.6x	16.0x
RFHIC	218410	KS	GaN transitors, amplifiers	$647	$565	0.6%	$99	17.3%	39.8%	25.0%	0.5x	14.3%	10.5x	15.0x
Seo Jin System	178320	KS	Casing, RRH	$375	$500	2.2%	$344	29.9%	23.8%	21.4%	1.9x	12.1%	5.3x	5.9x

in KRW B unless specified	Actual					Projected						% CAGR	
	2,014	2,015	2,016	2,017	2,018	2019E	2020E	2021E	2022E	2023E	2024E	13-18	19-24
Total Revenue	**211**	**220**	**211**	**204**	**296**	**864**	**1,130**	**1,459**	**1,750**	**1,946**	**1,993**	**7.0%**	**18.2%**
YoY Growth Rate	*-33.6%*	*4.3%*	*-4.3%*	*-3.2%*	*45.5%*	*191.7%*	*30.7%*	*29.2%*	*19.9%*	*11.2%*	*2.4%*	--	--
vs. Consensus	--	--	--	--	--	*15.5%*	*-3.7%*	*4.9%*	--	--	--	--	--
COGS	162	191	162	143	236	564	757	1,022	1,260	1,420	1,475	7.8%	21.2%
Gross Profit	**49**	**29**	**49**	**61**	**60**	**300**	**373**	**438**	**490**	**525**	**518**	**4.2%**	**11.6%**
Gross Margin	*23.2%*	*13.2%*	*23.3%*	*30.0%*	*20.4%*	*34.7%*	*33.0%*	*30.0%*	*28.0%*	*27.0%*	*26.0%*	--	--
vs. Consensus	--	--	--	--	--	*25.9%*	*7.4%*	*5.5%*	--	--	--	--	--
SG&A Expense	32	39	34	38	52	39	49	60	79	84	82	10.2%	15.9%
% of revenue	15.1%	17.6%	16.2%	18.5%	17.5%	4.5%	4.3%	4.1%	4.5%	4.3%	4.1%	--	--
R&D Expense	38	36	29	26	35	33	40	44	56	45	54	-1.6%	10.1%
% of revenue	17.8%	16.3%	13.8%	13.0%	11.7%	3.9%	3.5%	3.0%	3.2%	2.3%	2.7%	--	--
EBIT	**(20)**	**(46)**	**(14)**	**(3)**	**(26)**	**227**	**285**	**334**	**355**	**397**	**383**	**5.1%**	**11.0%**
EBIT Margin	*-9.7%*	*-20.7%*	*-6.7%*	*-1.5%*	*-8.8%*	*26.3%*	*25.2%*	*22.9%*	*20.3%*	*20.4%*	*19.2%*	--	--
EBITDA	**(10)**	**(32)**	**1**	**7**	**(17)**	**218**	**295**	**345**	**366**	**407**	**393**	***11.1%***	**12.5%**
EBITDA Margin	*-4.6%*	*-14.5%*	*0.3%*	*3.4%*	*-5.6%*	*25.3%*	*26.1%*	*23.6%*	*20.9%*	*20.9%*	*19.7%*	--	--
vs. Consensus	--	--	--	--	--	*21.9%*	*15.2%*	*15.7%*	--	--	--	--	--
EBT	**(20)**	**(50)**	**(12)**	**(8)**	**(31)**	**232**	**290**	**341**	**364**	**407**	**393**	**9.7%**	**11.1%**
Tax Expense	(0)	(2)	4	1	1	*43*	*54*	*63*	*67*	*75*	*73*	--	--
Tax Rate Rate	*2.0%*	*3.2%*	*-33.6%*	*-13.2%*	*-3.2%*	*18.5%*	*18.5%*	*18.5%*	*18.5%*	*18.5%*	*18.5%*	--	--
NI	**(19)**	**(48)**	**(16)**	**(9)**	**(32)**	**143**	**237**	**278**	**297**	**331**	**320**	**10.5%**	**17.5%**
NI Margin	-9.1%	-21.9%	-7.4%	-4.3%	-10.7%	16.5%	20.9%	19.1%	17.0%	17.0%	16.1%	--	--
vs. Consensus	--	--	--	--	--	6.7%	23.9%	26.5%	--	--	--	--	--

Sean Lee | seanlee21@gsb.columbia.edu | 347-640-0930

Long Copart (CPRT) - Prob-weighted IRR 12% (36 months – Jan 2023)

Buy recommendation

Copart, a leading online salvage vehicle auctioneer in a duopoly market, is a compounder with long runway for growth. Misguided by Copart's headline multiples, investors are paying more attention to its competitor, IAA. I believe Copart has numerous structural advantages over IAA and the gap between the two will further widen once the flywheel takes off. Copart's steady rate multiples will be lower and its superior fundamentals will drive the stock to its intrinsic value of $121.

Copart (CPRT)	1/13/20
Share Price (USD)	$96.26
Shares Outstanding(M)	233
Market Cap	**$22,380**
- Cash	$181
+ Debt	$541
Enterprise Value	**$22,740**
Land Value	$1,742
EntVal, ex-Land	**$20,998**
EV/EBITDA (LTM)	**26.2x**
P/E (LTM)	**37.8x**
ADTV (USD M)	$127.2
Float	88.7%
Short Interest as % of Float	3.0%
Insider ownership	11.2%

in US$M	Low	Base	High
Key Events	Lower accident rate, principal model in Europe	Market share gains from IAA and high salvage rate	Pricing growth and Europe embraces agency model
Probability	**10%**	**50%**	**40%**
2022E Revenue	**2,776**	**3,281**	**3,596**
vs. Consensus	*-3.4%*	*14.1%*	*25.1%*
2022E EBITDA	**$1,195**	**$1,405**	**$1,548**
vs. Consensus	*-4.8%*	*11.9%*	*23.3%*
EBITDA Multiple	**17x**	**19x**	**21x**
Enterprise Value	$20,321	$26,699	$32,518
Market Value	$19,961	$26,339	$32,159
Target Price	**$85.86**	**$113.28**	**$138.32**
Upside/(downside)	***-11%***	***18%***	***44%***
Weighted Avg. TP		**$120.55**	
Prob. Weighted IRR		**11.9%**	

Industry and Company Overview

Wide Moat: CPRT owns 170-self-owned facilities in 46 states, located near dense-population cities. The local economies of scale/density are multiplied by network effect (200K bidders in 147 countries).

Large TAM and Secular Growth Trend: Miles driven, accidents per mile, salvage rate (% of wrecked cars that are auctioned), and average repair cost (due to increasing vehicle complexity, age, and labor rates) have all been increasing.

CPRT's Superior Market Share: In the US, CPRT retains 45% vs. IAA's 35%. In the UK, CPRT dominates the market with 65% vs. IAA's 10%. In terms of GMV for the international business, Copart has $1.7B vs. IAA's $0.1B.

Broader supplier and customer base: CPRT have no supplier that accounts more than 10% of its revenue. Meanwhile, IAA's top 3 suppliers account for 40%. In addition, CPRT has been shifting its revenue mix towards higher margin non-insurance businesses (24% vs. IAA's 17%).

Better business model: While CPRT is 100% online, IAA is 60% online and 40% offline. IAA's plans to become 100% online may face difficulties as it needs to deleverage (3.6x debt/EBITDAR). This is a stark contrast with CPRT with 0.2x leverage.

Investment Thesis

1. 8% market share gains from IAA is a secular trend: My deep primary research indicates that an insurance company can fetch 17% higher average auction price on the CPRT's platform vs. IAA's because it retains 12x higher international GMV and 4M more unique visitors. Moreover, CPRT's CapEx has surged, which is a sign that it is adding excess capacity to capture more of IAA's high-value contracts. I expect IAA will transfer ~40% of its volume to CPRT.

Mkt Share	Insurance Companies	Most recent Copart	Most recent IAA	2017 Q4 Copart	2017 Q4 IAA
17%	State Farm	8%	9%	8%	9%
13%	GEICO	3%	10%	0%	13%
11%	Progressive Corp.	2%	9%	2%	9%
9%	Allstate Corp.	9%	0%	9%	0%
6%	USAA Insurance Group	3%	3%	3%	3%
5%	Liberty Mutual	3%	2%	3%	2%
4%	Farmers Insurance	4%	0%	0%	4%
3%	Nationwide Mutual	3%	0%	3%	0%
2%	American Family Insurance	2%	0%	0%	2%
2%	Travelers Companies Inc.	2%	0%	2%	0%
	Share on overall	39%	33%	31%	42%
	Share on top10	55%	45%	42%	58%

2. CPRT is in the early innings of disrupting international salvage market: From reading the biography of CPRT chairman, it took ~2 years to educate the UK insurance companies that the fee-based model obtains higher prices and better values than the buy-out. I believe that the company will be able to convert its customers in Germany, Spain, and Brazil to switch from the principal model to higher margin agency model by 2022, expanding margin.

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Risk

Advanced Driving Assistant System and Autonomous Vehicles may lower accident rate, raising questions on Copart's terminal value: I have spoken to various industry experts (including Progressive CEO) and they have told me that it will take 15 years for most cars to be equipped with ADAS and 7+ years for unmanned vehicles to proliferate commercially. Furthermore, vehicles will continue be totaled for other reasons, including natural disasters and aging. Thus, I believe there will be continued robust demand for salvage auction business and that the concern is overdone. Having said that, I have built DCF in which the terminal only constitutes 52% of the total value to consider the industry headwind.

Income Statement	Historical			Projected				CAGR Growth		% of Total Sales	
in $M (except per share amts)	2017	2018	2019	2020E	2021E	2022E	2023E	17-19	20-23E	2019	2023E
Revenue	**1,448**	**1,739**	**2,042**	**2,444**	**2,869**	**3,281**	**3,630**	***18.8%***	***14.1%***	--	--
YoY growth	*14.2%*	*20.1%*	*17.4%*	*19.7%*	*17.4%*	*14.4%*	*10.6%*	--	--	--	--
vs. Consensus	--	--	--	*4.3%*	*12.8%*	*14.1%*	--	--	--	--	--
Market Share of TAM	*20.6%*	*23.3%*	*25.7%*	*29.3%*	*32.9%*	*35.9%*	*37.6%*	--	--	--	--
Service (Agency Model) Revenue	1,286	1,512	1,756	2,137	2,546	2,938	3,264	*16.8%*	*15.1%*	*86.0%*	*89.9%*
YoY growth	*16.5%*	*17.5%*	*16.2%*	*21.7%*	*19.1%*	*15.4%*	*11.1%*	--	--	--	--
vs. Consensus	--	--	--	*3.8%*	*13.7%*	*16.0%*	--	--	--	--	--
Vehicle (Principal model) Revenue	162	227	286	306	323	343	366	*33.0%*	*6.1%*	*14.0%*	*10.1%*
YoY growth	*-1.4%*	*40.5%*	*26.0%*	*7.0%*	*5.4%*	*6.2%*	*6.8%*	--	--	--	--
vs. Consensus	--	--	--	*8.2%*	*6.0%*	*0.2%*	--	--	--	--	--
Yard Operations Exp., excluding D&A	638	790	825	998	1,181	1,345	1,487	*13.7%*	*14.2%*	*40.4%*	*41.0%*
Yard Depreciation & Amortization	40	57	63	76	90	106	120	*25.7%*	*16.7%*	*3.1%*	*3.3%*
Cost of Vehicle Sales	138	196	256	263	278	289	307	*36.3%*	*5.3%*	*12.5%*	*8.5%*
Gross Profit	**632**	**695**	**898**	**1,107**	**1,320**	**1,542**	**1,715**	*19.2%*	*15.7%*	*44.0%*	*47.3%*
Gross Margin	*43.6%*	*40.0%*	*44.0%*	*45.3%*	*46.0%*	*47.0%*	*47.3%*	--	--	--	--
G&A Cost, excluding D&A	134	156	160	187	215	242	265	*9.2%*	*12.3%*	*7.8%*	*7.3%*
G&A D&A	17	21	22	26	28	32	35	*12.9%*	*11.0%*	*1.1%*	*1.0%*
EBIT	**481**	**585**	**716**	**894**	**1,077**	**1,267**	**1,415**	***22.1%***	***16.5%***	***35.1%***	***39.0%***
EBIT Margin	*33.2%*	*33.7%*	*35.1%*	*36.6%*	*37.5%*	*38.6%*	*39.0%*	--	--	--	--
Adj. EBITDA	**538**	**665**	**802**	**996**	**1,195**	**1,405**	**1,571**	***22.1%***	***16.4%***	***39.3%***	***43.3%***
vs. Consensus	--	--	--	*-2.4%*	*5.7%*	*11.9%*	--	--	--	--	--
EBITDA Margin	*37.2%*	*38.2%*	*39.3%*	*40.7%*	*41.6%*	*42.8%*	*43.3%*	--	--	--	--
NI	**394**	**418**	**592**	**725**	**875**	**1,033**	**1,155**	***22.5%***	***16.8%***	***29.0%***	***31.8%***
EPS	**$1.72**	**$1.80**	**$2.57**	**$3.12**	**$3.76**	**$4.44**	**$4.97**	***22.2%***	***16.8%***	--	--
vs. Consensus	--	--	--	*11.3%*	*21.0%*	*22.4%*	--	--	--	--	--

Valuation

Attractive risk/reward ratio: Copart's current EBITDA multiple is 10x turns above the historical average of 13x. But the premium is justified given that the ROIC is currently 28% ROIC, which is above the 10-year average of 19%, and that CPRT will grow at 14% CAGR through 2023. I valued CPRT at 19x EBITDA on 2021 est.

(US$Mn)	Equity Val	Ent Val	Revenue	Revenue growth YoY	Revenue growth 2020E	EBIT Margin	Debt/ EBITDA	EBITDAx 2020E	P/Ex 2020E	ROIC
IAA	**$6,181**	**$8,147**	**$1,430**	**8.8%**	**4.5%**	**21.6%**	**3.5x**	**18.9x**	**28.7x**	**20.7%**
CPRT	$22,380	$22,740	$2,042	13.1%	19.7%	35.1%	0.2x	21.1x	30.9x	28.4%
Auction Peer	**$209,823**	**$215,945**	**$73,282**	**23.4%**	**17.3%**	**21.0%**	**3.0x**	**21.2x**	**26.5x**	**16.3%**
eBay	$29,165	$33,355	$10,856	2.6%	1.8%	31.0%	2.5x	8.9x	12.6x	15.5%
Booking	$79,796	$77,149	$87,349	5.8%	7.4%	40.2%	1.5x	12.3x	17.0x	22.6%
Etsy	$5,264	$5,280	$748	38.6%	25.8%	18.9%	6.1x	22.8x	35.1x	16.5%
MercadoLibre	$33,280	$31,141	$2,050	49.7%	33.0%	1.0%	--	43.3x	--	13.3%
Amazon	$901,612	$932,802	$265,408	20.1%	18.4%	13.9%	2.0x	18.7x	41.4x	13.4%

Nelnet (NNI) - 12% Alpha Short (Best Play on Student Loan Forgiveness)

	Actual		Base				Consensus				Delta			
	2020	2021	Q3E-22	Q4E-22	2022E	2023E	Q3E-22	Q4E-22	2022E	2023E	Q3E-22	Q4E-22	2022E	2023E
Total Avg Loan Balance	19,567	17,674	12,695	13,651	14,832	13,402	15,322	14,957	15,981	14,109	-17.1%	-8.7%	-7.2%	-5.0%
Net Interest Income (AM)	290	348	59	52	266	221	74	74	303	294	-20.8%	-29.8%	-12.3%	-24.8%
Loan Servicing & Other	452	486	100	101	463	371	130	130	521	530	-23.2%	-22.0%	-11.2%	-30.1%
Tuition Payments	282	338	96	91	390	433	94	91	388	391	2.6%	-0.4%	0.6%	10.8%
Net Revenue	1,337	1,337	275	263	1,099	884	318	315	1,460	1,295	-13.7%	-16.4%	-24.7%	-31.7%
EBT	450	502	68	64	481	258	84	78	512	309	-19.3%	-17.6%	-6.1%	-16.4%
NI Adj	374	323	52	50	232	200	65	60	255	237	-19.6%	-17.4%	-9.0%	-15.7%
EPS Adj	$9.57	$8.37	$1.43	$1.40	$6.26	$5.80	$1.73	$1.61	$6.77	$6.50	-17.4%	-13.3%	-7.5%	-10.7%
P/Ex						12.0x				13.5x				-11.4%
PT						$69.62				$88.00				-20.9%
	Weight	PT	Return		Upside	15.0%								
Weight to P/Ex Valuation	50.0%	$75.37	8.0%											
Weight to SoP Valuation	50.0%	$69.62	15.0%											
Sean's 1Y Weighted PT	$72.49													
Upside/Downside	***11.5%***													

Summary: Contrary to my preconception, the compression of net interest margin (NIM) with rising interest rates doesn't present a compelling short thesis as NIM has stayed consistent historically, even during times of high-interest rates. However, my expectation that NNI is a better name to monetize student loan forgiveness than Navient (NAVI) was correct. Although NAVI has a bigger federal-insured loan portfolio ($49B vs. NNI's $16B), NNI is a complicated stock in beaten off the path (NAVI has 9.2% SI as % of a float vs. NNI's 3.1%) and has weaker fundamentals (poor capital allocation). NNI is also trading at a significant discount to its historical average (12.5x forward P/E current vs. 10x) and NAVI (5.2x P/E), suggesting a margin of safety. A breakdown of NNI's servicing income sources allowed me to more accurately forecast servicing revenue that differs by 6% vs St. In addition, I accurately captured the timing of Federal Family Education Loan Program (FFELP) DCFs under various prepayment scenarios and offsetting impact of cash proceeds being used to accelerate share repurchase and lower leverage. I've used a combination of P/Ex and Sum of the Parts because the sell-side uses the multiple approach and the buy-side utilizes SoP.

($ in USD millions)	Downside	Base	Upside
Prepayment Rate	4.25%	23.00%	42.50%
Asset Mgmt (DCF) Value	1,266	1,122	979
Loan Servicing EBITAx	5.0x	4.0x	3.0x
Loan Servicing Value	416	333	250
Tuition Payments EBITAx	15.0x	12.0x	11.0x
Tuition Payments Value	1,991	1,593	1,460
Corporate Value		(80)	
Cash		128	
Corp. Debt		363	
Conglomerate Discount	0.0%	0.0%	5.0%
Total Equity Value	3,359	2,734	2,255
Per Share	$89.93	$77.04	$66.74
Upside/(Downside)	-9.8%	6.0%	18.5%
Probability	15%	50%	35%
Prob. Weighted Stock Price		$75.37	
Return		8.0%	
P/B		1.3x	

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Case	Case Description		Prob.
Downside	4.25% Prepayment Rate	Republicans block the forgiveness plan OR a lawsuit that make its way to the Supreme Court delays the plan -- -- Borrower default rates at 6%	
	Loan Servicing	FFFELP loan servicing volume remains $24B. But DLP loan servicing volume increases from $540B to $600B and DLP fee as % of volume increases from 70bps to 1% as DoE consolidates the mkt to 5 p Revenue from Software services increases from $35M to $50M and Outsourced services, as contrary to expected with declining COVID related one-time benefit, only declines from $25M to $20M in 26% EBITA Margin. With Biden's forgiveness plan gone/delayed, there are less customer calls, resulting in termination of temporary call service center representatives.	15.0%
	Tuition Payment	35% EBITA margin. Serves 2M more K-12 schools (from 11M), increasing mkt share from 40% to 47%. Serves 200 more colleges/universities (from 1,300), increasing mkt share from 30% to 35% by 2	
	Capital Allocation	$196M spent on share repurchase.	
	Investor Perception	Investors continue to apply 0% conglomerate discount P/E multiple at 14x.	
Base	17% Prepayment Rate	Plan gets implemnted without the Court disapporval or delay The new features in the new IDR proposal sharply increases take-up rates and the IDR program costs $260B DoE expands access to commercially held FFELP borrowers who don't consolidate into the Direct Loan program Borrower default rates decline from 6% to 4% due to lower debt balance.	
	Loan Servicing	With debt cancellation, FFELP loan servicing volume declines from $24B to $17B in Q322 and DLP loan servicing volume declines from $540B to $367B. Revenue from Software services increases from $35M to $45M and Outsourced services, as expected with declining COVID related one-time benefit, declines from $25M to $15M in 2022. 22% EBITA Margin. Continued high level of customer calls, resulting in continued high compensation expense due to continued elevated number of call service center representatives.	50.0%
	Tuition Payment	33% EBITA margin. Serves 1M more K-12 schools and 100 more colleges/universities. Higher number of payment plans in the K-12 market, partially offset by the impact of lower college enrollment t	
	Capital Allocation	With $144M cash proceeds from the decline in FFELP loan portfolio, $340M spent on retiring 11% S/O (decline from 38M to 34M).	
	Investor Perception	Investors continue to apply 0% conglomerate discount P/E multiple at 10.5x with mean reversion to its historical average.	
Upside	42.5% Prepayment Rate	Plan gets implemnted without the Court disapporval or delay New features in the new IDR sharply increases take-up rates and DoE auto-enrolls borrowers for which it had sufficient info - IDR program costs $450B DoE doesn't expand access and most FFELP borrowers consolidate their FFELP loans into the DLP. Borrower default rates decline from 6% to 3% due to lower debt balance. Decreased deferments and forbearance rates increase prepayment rates.	
	Loan Servicing	With debt cancellation, FFELP loan servicing volume declines from $24B to $15B in Q322.DLP loan servicing volume increases from $540B to $3400B. FFELP fee as % of volume declines from 6.8% to t Revenue from Software services increases from $35M to $40M and Outsourced services declines from $25M to $10M (pre-COVID normalized level) in 2022. 22% EBITA Margin. Continued high level of customer calls, resulting in continued high compensation expense due to continued elevated number of call service center representatives.	35.0%
	Tuition Payment	30% EIBTA Margin.Growing competition from small software companies, accounting firms and financial institutions, creating smaller fee and market share declines.	
	Capital Allocation	With $288M cash proceeds, $340M spent on share repo and $144M spent on paying down debt, lowering Tangible Common Equity ratio from 14.1 to 12.	
	Investor Perception	Investors continue to apply 5% conglomerate discount as the loss of unrrelated investments accumulate and the mkt no longer rewards management for its "strong" capital allocation skills. P/E multiple at 9.5x as investors realize the financial implications of declining FFELP loan portfolio and slower than expected loan servicing and tuition payment businesses.	

Businesses

Net Interest Income (26% of 2021 Rev)

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022E	2023E
Net Interest Income	235	371	365	345	414	437	432	373	305	254	249	290	348	266	221
as % of Net Revenue	*36.2%*	*46.0%*	*50.0%*	*48.8%*	*46.3%*	*47.3%*	*48.5%*	*44.3%*	*42.3%*	*23.9%*	*23.9%*	*21.7%*	*26.0%*	*18.6%*	*17.7%*
Total Loan Portfolio	23,978	23,992	24,346	24,883	25,963	28,054	28,375	24,956	21,869	22,438	20,731	19,567	17,674	13,777	13,761

Historical: NNI was involved in 1 primary business line: originating and servicing student loans for the Federal Family Education Loan Program (FFELP). **As NNI takes no credit risk**, given these loans are insured by the federal government, **FFELP has been the primary source of the 20% CAGR in BV since the company went public in 2003 to 2019** (vs. 14% CAGR from 2009 to 2021 as NNI diversified its revenue sources).

														CAGR
	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	09-21
Tangible CE/shr	$11.83	$15.22	$19.16	$21.93	$28.35	$33.50	$37.06	$43.74	$47.19	$49.70	$53.64	$61.83	$71.48	**16.2%**
BV per Share	$15.80	$18.38	$22.19	$24.60	$31.00	$37.13	$41.39	$48.32	$51.43	$56.33	$59.60	$67.39	$76.51	**14.1%**

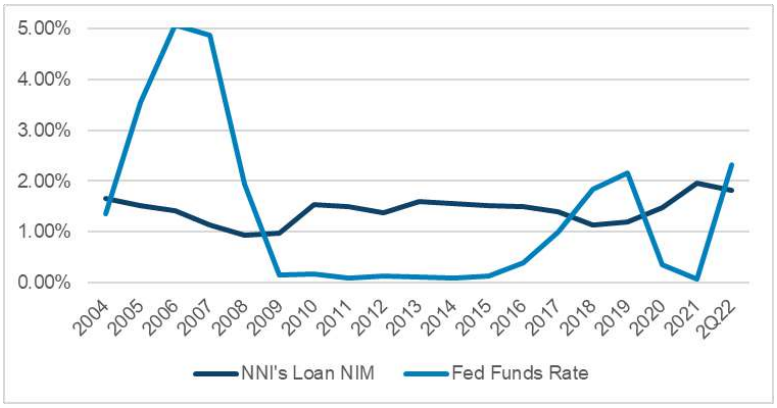
Most of its portfolio is funded in Asset Backed Securitizations (ABS) that are structured to substantially match the maturity of the funded assets, thereby minimizing liquidity risk. The cash generated from the student loans held in these ABS pays down the ABS bondholders, with the residual interest/equity tranche held by NNI. The company makes money on the spread between the yield on the loans and the cost of financing, as well as on the servicing/admin fees the company earns on the transactions.

In 2010, the Federal Gov terminates FFELP, concluding that it will save $60B by implementing Direct Loan Program (DLP). Although $24B FFELP was put into run-off, the loan portfolio grew to $28B in 2014 as Navient and NNI have been consolidating the space. Bulge bracket banks exited the space as the servicing arm of these two had a competitive advantage in holding the loans over banks. In addition, the subscale competitors didn't want a run-off portfolio on their books, selling them to NAVI and NNI (currently 40% and 13% FFELP market share respectively).

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	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Stafford and other	7,621	7,928	7,480	7,261	6,687	6,031	6,202	5,186	4,419	4,970	4,684	4,383	3,992
Consolidation (lower margin)	15,852	15,830	16,853	17,709	19,364	22,166	22,086	19,644	17,303	17,186	15,644	14,746	13,187
Total FFELP	**23,473**	**23,758**	**24,333**	**24,970**	**26,050**	**28,196**	**28,288**	**24,830**	**21,722**	**22,156**	**20,329**	**19,129**	**17,179**
YoY Growth		1.2%	2.4%	2.6%	4.3%	8.2%	0.3%	-12.2%	-12.5%	2.0%	-8.2%	-5.9%	-10.2%

Debunking our preconception on Interest Rate Risk- NNI seems to be liability sensitive, and with rising interest rates, CFs should diminish as the company has primarily been earning fixed on the student loans while paying floating in a low rate environment. Rising interest rates will reduce the amount of floor income received and this will have an impact on earnings due to interest margin compression caused by increased financing costs. NIM chart shown on the right shows how NIM isn't really correlated to the Fed Funds rate and that NIM has been hovering between 1% and 2%, even when the Fed Funds rate was 5% in in 2006. This suggest that **CFs won't be largely impacted by the rising rates.** This phenomenon is due to 2 reasons.



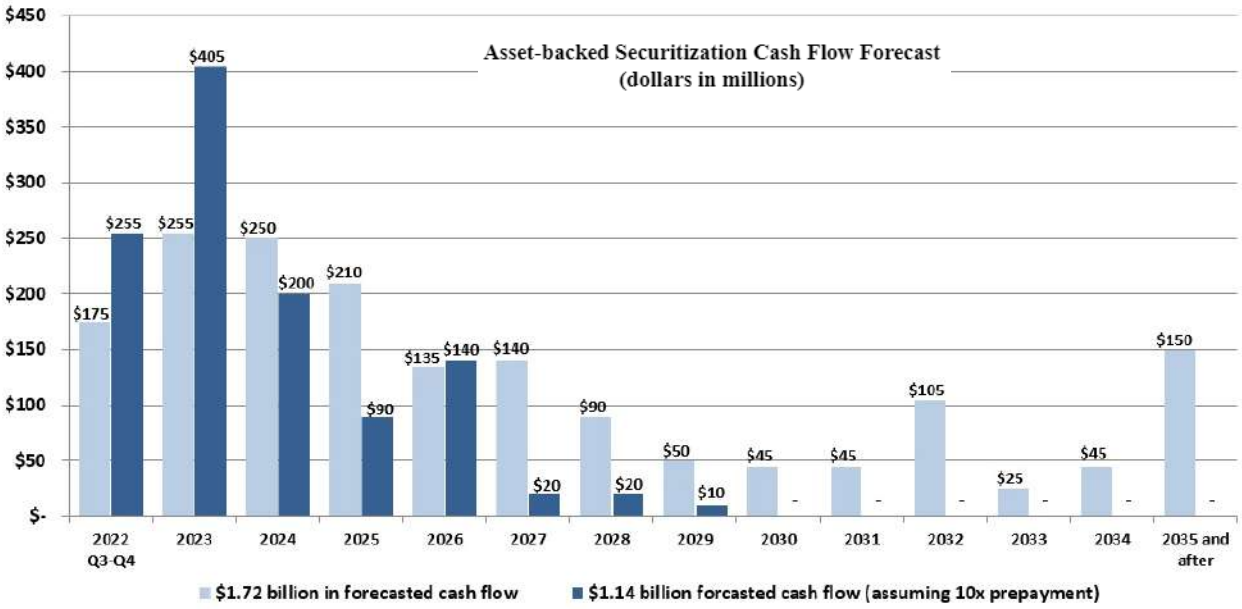
First, FFELP loans originated before April 1, 2006 generally earn interest at the higher of the borrower rate (which is fixed over a period of time) OR a floating rate based on the Special Allowance Payments formula set by the DoE (Department of Education). The SAP rate is based on an applicable index + a fixed spread that depends on loan type, origination date, and repayment status. Thus, **in rising interest rates environment where the interest rates are above the borrower rate, the fixed rate FFELP loans convert to variable rate loans per their SAP formulas, reducing the impact of the rate fluctuations.** Secondly, there are **interest rate hedges** and NNI optimally **diversifies funding sources** from ABS to warehouse facilities and other credit products to mitigate interest rate risk.

Looking Forward: Credit Suisse is the only credible analyst that follows NNI, and it started covering NNI only recently (it doesn't build out 3 statement forecast for NNI). JPM and Barclays cover Navient but along with CS, they didn't triangulate the impact of student loan forgiveness program, stating that there are many moving parts that haven't been decided yet (presumably referring to whether DoE will expand access loan cancellation to FFELP borrowers who don't consolidate into the DLP and the high dispersion of the cost of new Income-Driven Repayment (IDR) program which Wharton estimated to cost anywhere from $70B to $450B). Instead, sell-side assumes consistent level of FFELP loan portfolio. In my scenario analysis, I've captured the range of financial impact of the Forgiveness Program by primarily sensitizing the prepayment rate.

	Actual		*Base*				*Consensus*			
	2020	2021	Q3E-22	Q4E-22	2022E	2023E	Q3E-22	Q4E-22	2022E	2023E
Total Avg Loan Balance	19,567	17,674	12,695	13,651	14,832	13,402	15,322	14,957	15,981	14,109

The primary variable in establishing a life of loan estimate is the level and timing of prepayments. Prepayment rates = amt of loans that prepay annualized as a % of the beginning of period balance, net of scheduled principal payments. A number of factors can affect estimated prepayment rates, including the level of consolidation activity, borrower default rates, and utilization of debt management options such as income-based repayment, deferments, and forbearance. The changes in these factors impact the projected future cash flow.

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Increase in prepayment rate	Reduction in forecasted cash flow from table above	Forecasted cash flow using increased prepayment rate
2x	$0.13 billion	$1.59 billion
4x	$0.33 billion	$1.39 billion
10x	$0.58 billion	$1.14 billion

$1.72B mgmt's forecasted ABS CF assumes prepayment rates of 4% for consolidation loans and 5% for all other loan types. On April 19, 2022, DoE announced that under the new IDR plans, borrower with loans that have accumulated time in repayment, including time in certain forbearances and deferments, of at least 20 or 25 years will see automatic forgiveness. On August 23, 2021, Biden announced $520B loan forgiveness and $70B new IDR program that span over 9 years, and $16B one-time loan forbearance. The administration also extended the suspension of borrower payments under the CARES Act. These announced changes have increased FFELP loan prepayments. NNI summarized the estimated impact to the student loan portfolio CFs under various prepayment scenarios.

Table 1. Conventional Budget Estimates of the Broad Student Debt Forgiveness, FY2022 - 2031

Billions of Dollars

Provision	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	Budget Window
Loan forgiveness (*)	468.6	5.5	5.0	5.0	5.4	5.2	5.9	5.9	6.1	6.4	519.1
Loan forbearance	16.0	0	0	0	0	0	0	0	0	0	16.0
New IDR program (*, **)	41.6	2.8	2.8	2.7	2.6	2.9	3.4	3.6	3.8	4.0	70.3
Total	**526.3**	**8.3**	**7.8**	**7.7**	**8.1**	**8.1**	**9.3**	**9.5**	**9.9**	**10.4**	**605.4**

* For clarity, costs are recorded in the shown year based on outstanding loan vintage. For IDR, Congress can determine a different cost path of subsidy rates by year.
** New IDR program costs are fully "static" by assuming takeup rates of existing IBR programs. A "conventional" score would include an increase in takeup rates, as discussed below.

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I then used a 6% discount rate to value these CFs as shown in the table. Given that the no credit risk CFs are front-loaded and stable, I could argue that the discount rate used for those initial CFs should be slightly higher than the equivalent ~3% Treasury rates with CFs further out being discounted at a modestly higher rate (4-6%). Alternatively, I could argue that the discount rate we should use is the return we require to hold a position weighted against the relative risk of the CFs. In that case, the discount rate used should be substantially higher (6%+). To factor in both of these arguments, I used 6%.

	yr	1	2	3	4	5	6	7	8	9	10	11	12	13	14		
	Undiscounted	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	**Total**	**Delta**
	4.25% Prepayment	175	255	250	210	135	140	90	50	45	45	105	25	45	150	**1,720**	
2x	8.5% Prepayment															**1,590**	-7.6%
4x	17% Prepayment															**1,390**	-19.2%
10x	42.5% Prepayment	255	405	200	90	140	20	20	10							**1,140**	-33.7%
24x	100% Prepayment															**1,070**	-37.8%
	Discounted																
	4.25% Prepayment	165	227	210	166	101	99	60	31	27	25	55	12	21	66		
	42.5% Prepayment	241	360	168	71	105	14	13	6	0	0	0	0	0	0		
	DCF		Delta														
	4.25% Prepayment	**1,266**															
	42.5% Prepayment	**979**	-22.7%														
	Discount Rate	6%															

In recent years, the GAAP earnings of the run-off portfolio have exceeded CF since the student loan trusts require that excess earnings (103% of parity) before cash can be released. The dynamic we should be seeing in the future is the segment shows lower earnings, but increased CF. This is another reason why I believed using DCF to value NNI's asset management business that acquires, finances, and generates NIM from its FFELP loan portfolio.

Loan Servicing Fee Income (36% of 2021 Rev, est. 22% EBITA Margin)

Loan Servicing	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022E	2023E
DLP Servicing (NNI + Great L	**97**	**124**	**133**	**152**	**156**	**325**	**344**	**327**	**361**	**342**	**312**
FFELP Guaranty Servicing	12	11	9	2	0	0	0	0	0	0	0
FFELP Guaranty Collection	74	55	48	7	0	0	0	0	0	0	0
FFELP Servicing	**20**	**13**	**14**	**16**	**16**	**32**	**25**	**20**	**18**	**14**	**11**
PE & Consumer Loan Servi	**9**	**10**	**12**	**16**	**28**	**41**	**37**	**32**	**47**	**49**	**5**
Software Services	29	22	19	18	18	33	41	42	35	31	35
Outsourced Services & Oth	2	3	4	4	6	9	9	30	25	8	8
Loan systems and servicing	**243**	**240**	**240**	**215**	**223**	**440**	**455**	**452**	**486**	**463**	**371**
as % of Net Revenue	*27.2%*	*26.1%*	*27.0%*	*25.6%*	*30.9%*	*41.4%*	*43.7%*	*33.8%*	*36.4%*	*33.9%*	*33.5%*

Servicing Volume	Q1-21	Q2-21	Q3-21	Q4-21	Q1-22	Q2-22	Q3-22	Q4-22	2023E
DLP (NNI + Great Lakes)	453,681	452,450	461,054	478,402	507,653	542,398	366,545	370,000	390,000
FFELP	30,084	29,361	28,244	26,916	25,646	24,224	17,199	17,199	18,000
PE & Consumer	21,397	24,758	24,229	23,702	23,433	22,838	23,000	23,000	24,000
Fee as % of Volume									
DLP (NNI + Great Lakes)	0.017%	0.018%	0.018%	0.025%	0.021%	0.018%	0.018%	0.019%	0.080%
FFELP	0.016%	0.016%	0.016%	0.016%	0.017%	0.017%	0.017%	0.016%	0.060%
PE & Consumer	0.040%	0.052%	0.054%	0.054%	0.055%	0.053%	0.053%	0.053%	0.020%

History: NNI services $24B FFELP loans (10% mkt share), $542B DLP loans (40% mkt share) and $22B consumer loans for private lenders and banks.

Looking Forward: From Wharton's $469B loan forgiveness provision estimate, I assumed 15.3% of that would be spent on canceling $72B FFELP loans and $440B DLP loans based on how much each respective loans are outstanding as % of the total Federal student loans. Because 50% of FFELP loans are held by commercial companies, I calculated $36B FFELP loans to be forgiven for student loan servicing companies. Then I multiplied FFELP and DLP loans by NNI's market share to estimate NNI's servicing volume decline of $7B for FFELP loan and $176B for DLP loan.

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DoE is planning to sign new DLP servicing contracts with only 5 companies (consolidating the market) which include NNI. NAVI, after significant trouble with lawsuits over alleged deceitful servicing practices, sold DLP servicing business. As a result, I believe NNI will get more DLP servicing contracts. Thus, I've forecasted DLP servicing volume to increase from $367B in Q322 to $390B by 2023 to reflect these tailwinds.

Tuition Payment Processing (11% of 2021 Rev, est. 33% EBITA Margin)

	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022E	2023E
Tution Pmt Processing	54	60	68	74	81	98	120	133	146	222	277
YoY Growth		11.0%	13.3%	9.8%	8.4%	21.7%	22.6%	10.3%	9.8%	52.3%	24.9%
as % of Net Revenue	*6.0%*	*6.5%*	*7.6%*	*8.9%*	*11.2%*	*9.2%*	*11.6%*	*9.9%*	*10.9%*	*16.3%*	*25.1%*

History: NNI collects administrative fees for allowing students/families to make monthly tuition payments rather than lump sum payments. The campus commerce business includes cashiering for face-to-face transactions, campus-wide commerce management, and refunds management. The company also earns revenue for e-billing, hosting/maintenance, credit card processing fees, e-pay transaction fees, etc. These packages are sold via subscription service to colleges. This appears to be a low capital intensity and recurring revenue business similar to other payments-based companies. Estimated market

share in K-12 is 40% (1M schools) and in colleges/universities is 25% (1,200 higher education institutions). It appears that the customer base in K-12

Looking Forward: In addition to getting new schools on the platform, the real opportunity in K-12 appears to be cross-selling between schools on the RenWeb platform (acquired in 2014) and NNI's FACTS and NCC system brand schools, given the two have 4,000 schools unique to each other.

It appears that the customer base in K-12 is very sticky because Catholic schools don't really switch often and they communicate with one another. So if NNI wins one Catholic school, there is a high chance that NNI wins many others. I've reflected the dispersion in future growth rates and in investors' perception of the quality of the business by sensitizing the multiples in the SoP valuation.

Management

Questionable corporate governance isn't discussed by the mkt.:

	NNI's %	
	Ownership	Voting Rights
Mike Dunlap (Exec. Chairman & Founder)	**10%**	**82%**
under his name	7%	--
via ownership of F&M	3%	--
Angela Muhleisen (CEO of Union Bank and F&M)	**22%**	**12%**
under her name	19%	--
via ownership of F&M (owns Union Bank)	3%	--
Deobrah Bartels	**7%**	**--**
Mike and His Sisters (Muhleisen & Marels)	**39%**	**94%**

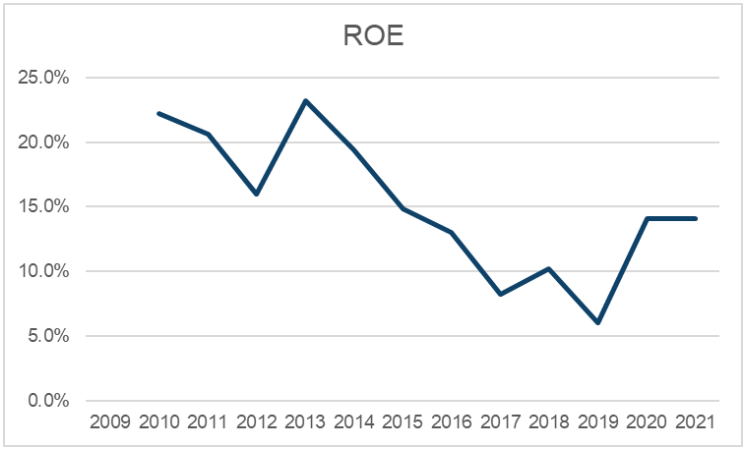
Although Mike Dunlap (Exec. Chairman & founder and CEO of Nelnet Bank, NNI's subsidiary) only owns 10% of NNI shares, he has 82% of the voting rights. His sisters own 29% - Deborah Bartels has 7% and Angela Muhleisen, who is a CEO, Chair, and President of Union Bank has 22% and 12% of the voting rights. Thus, Dunlap and his family essentially retain 39% of shares and 94% of voting rights (even his son is also a Board member and Chief Business Development Officer). Bulls may look at this along with mgmt's 5% equity stake, and argue that there is an aligned interest of shareholders and managers given high insider ownership.

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But I believe they're ignoring the high possibility of controlling shareholders taking actions that benefit them but not minority shareholders. My concerns are corroborated by NNI's lack of check/balance, numerous suspicious transactions (buy/sell FFELP loans) and service agreements with Union Bank that weren't offered to 3rd parties via competitive bids (in net, NNI reported $11M income from Union Bank in 2021) and the unnecessarily complicated ownership structure – Union Bank is controlled by Farmers & Merchants (Dunlap and his spouse own 50%, and Muhleisen owns 50%) and owns 6% of NNI shares.

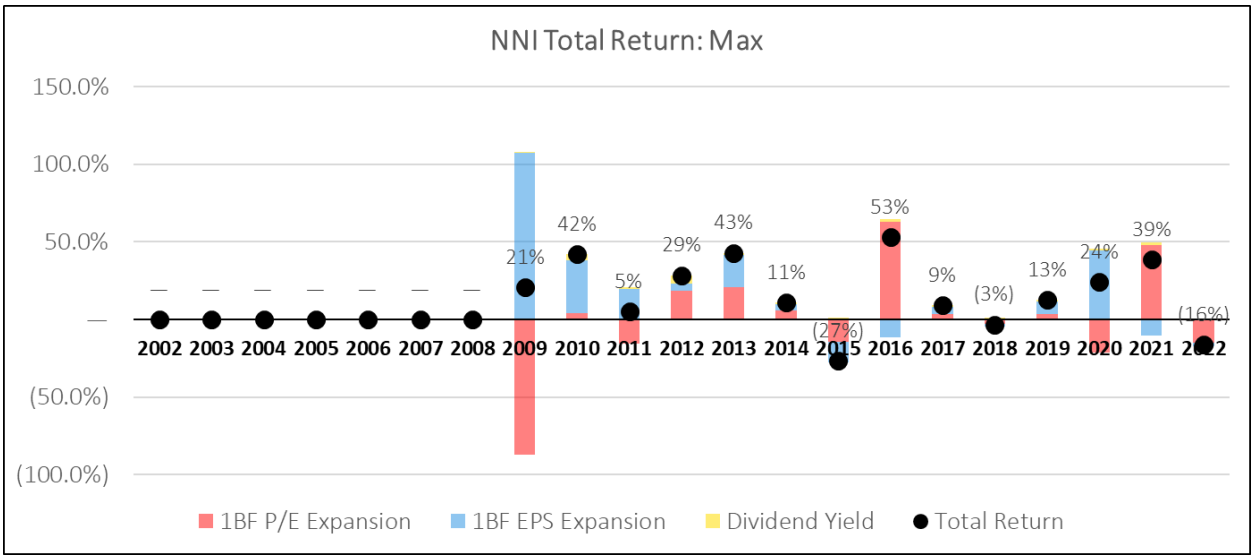
Capital Allocation

Bulls praise Mike Dunlap for his ability to select high ROIC opportunities, citing that he founded the company in 1996 with an initial $50K investment and turning it into $109M before IPO and $168M equity capital via IPO. They even refer him to Warren Buffett, citing that they are both in Nebraska and that as Berkshire Hathaway uses an insurance portfolio, NNI uses loan portfolio to invest in great businesses.



Dunlap's fans support their claims by citing deals like Hudi, a software company that targets the sports market with video editing/sharing, play diagrams, and highlight reels. Hudi's valuation increased from $250M in 2015 to $450M in 2017.

I disagree with bulls' perception because as the ROE chart shows, ROE declined from 22% in 2010 to 14% in 2021. This is due to NNI's investment in unrelated (no synergy) and profit-losing (negative to low ROIC) businesses that I believe don't have significant upside. For instance, in December 2015, NNI spent $46M to acquire 92% of ALLO Communications, a telecom company in Nebraska that offers fiber-optic service. Then NNI spent $39M and $100M capex in 2017 and 2018 respectively. Despite the massive investment, ALLO is dilutive to earnings and NNI even decided to no longer disclose the financial result of ALLO. NNI plans to burn more cash by targeting 60% penetration in Lincoln from the current market share of 30%. NNI also acquired 100% of Whitetail Rock Capital Management (investment advisors with $1B AUM). It is even invested in solar business and VC funds that are currently valued at -$47M and $223M respectively.



Sean Lee | seanlee21@gsb.columbia.edu | 347-640-0930

AAPL – Short (Prob-weighted IRR 11%, 1-year target)

Summary: AAPL is at an all-time high with its 24x P/E (LTM) at a substantial premium over its 10-year historical average of 16x. While the total revenue growth only increased by 2% and ROIC is 5% below the historical average, the bulls believe that the multiple is justified given the higher mix of recurring Services revenue. They dismiss the 15% YoY decline in iPhone revenue in 2019 and claim that the Services revenue can grow independently of hardware sales. However, I believe that the software business is driven by the installed base of iPhone and iOS devices, and the structural decline of hardware business will limit the long-term growth of services revenue. Once investors recognize the strong interconnect when AAPL reports disappointing quarters in 2020, I believe the bullish sentiment will change and mispricing will correct.

Apple (AAPL)	2/18/20
Share Price (USD)	$319.00
Shares Outstanding *(M)*	4,376
Market Cap ($B)	**$1,396**
- Cash	$207
+ Debt	$117
Enterprise Value ($B)	**$1,306**
EV ex-net cash	**$1,216**
Dividend Yield	0.97%
ADTV ($B)	$10
Float	87.9%
Short Interest as % of float	*1.1%*
P/E ex-net cash (LTM)	**22.7x**
P/E (LTM)	**24.3x**

	Key Events	Low Robust iPhone sales & licensing revenue & less rev. cannibalization	Base Disappointing iPhone sales & revenue cannibalization	High Margin compression and ROIC decline with new businesses
	Total Rev. CAGR (2021)	***9.5%***	***3.9%***	***0.8%***
	vs. Consensus	*5.6%*	*-4.9%*	*-10.4%*
Hardware	**Revenue growth rate**	***10.5%***	***1.8%***	***-0.5%***
Hardware	*vs. Consensus*	*6.5%*	*-3.1%*	*-9.0%*
Hardware	NI (2021)	$41,243	$34,328	$33,057
Hardware	**P/E ex-net cash**	**15.0x**	**13.0x**	**11.0x**
Software	**Revenue growth rate**	***20.1%***	***11.1%***	***8.6%***
Software	*vs. Consensus*	*10.4%*	*-3.9%*	*-8.4%*
Software	NI (2021)	$25,201	$20,613	$25,170
Software	**P/E ex-net cash**	**32.0x**	**26.0x**	**22.0x**
	Net Cash (2021 in $M)	$12,920	$39,361	$72,412
	Shares Outstanding (in M)	4,061	4,144	4,248
	Target Price	**$354.05**	**$246.50**	**$202.50**
	Upside/(downside)	***11%***	***-23%***	***-37%***
	Probability of Likelihood	40%	50%	10%
	Prob-weighted TP	$141.62	$123.25	$20.25
	Weighted Avg. TP		**$285.12**	
	Prob. Weighted IRR		-10.6%	

Company Description

AAPL will continue to be a 'iPhone story': The revenue of iPhone and products constitute 55% and 82% of AAPL's total revenue. With the YoY decline in revenue from iPhone by -15% and products by -6% in 2019, the bull theses have been that AAPL will have greater revenue mix towards the higher margin (32% gross margin for products vs. 64% that of service) and less cyclical service revenue. However, the service revenue is driven by the iPhone sales. By using the device as AAPL's equivalent of Gillet's razors, AAPL not only makes incremental revenue from Apple Care and licensing fees, but also creates an ecosystem to utilize its install base to make money with music streaming, iTunes, and App Store. Thus, the argument that the service revenue can grow significantly and independently while the key driver is declining is a difficult one to make. I acknowledge that the services adoption rate on iPhone installed base is increasing. As a result, on a net basis, I predict that the services revenue will grow at 11% CAGR through 2023, a moderate rate than the street anticipates.



Why the opportunity exists

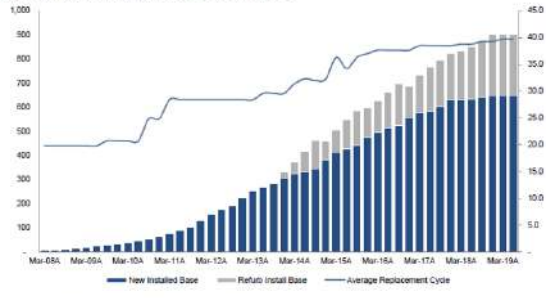
Non-disclosure of the service revenue breakdown fuels unchecked optimism: Licensing, the biggest and one of the most lucrative component of service business, primarily consists of the fees that Alphabet pays to AAPL for letting Google be the default search engine for Siri and Safari be the default browser on AAPL devices. The sell-side's estimates on this revenue stream in 2019 ranges from $4B to $12B. $12B, however, implies that AAPL somehow managed to hike the traffic acquisition cost fees 12-fold in 5 years (the only official figure is what was disclosed on the court filings, which indicated that Alphabet paid AAPL $1B in 2014). Although Google's TAC has risen significantly, considering that the growth rate of AAPL's installed base has been relatively flat these past few quarters, I am skeptical of such bullish speculation. Even if I am wrong, AAPL's dependence on TAC fees from Google weakens the long thesis that the company is increasing its mix of less cyclical services revenue because the ad industry is highly cyclical and faces headwinds with rising data privacy concerns.

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Investment Thesis:

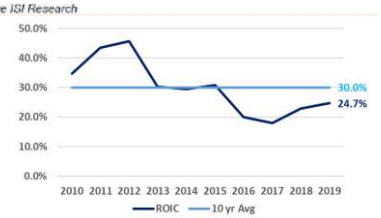
1. Revenue will deteriorate as the iPhone replacement cycle is structurally lengthening and as the growth of new installed base remains flat: On November 2019, AAPL stopped reporting unit sales for iPhones, iPads, and Macs. I believe this unveils the management's pessimistic outlook towards the hardware business, the leading indicator of the Services revenue. As the 1.4B iOS installed base, which is the main users of Apple's service offerings, gradually declines, the Services revenue will wane.

Figure 1: iPhone Replacement Cycle & Installed Base



Source: Company Data, Evercore ISI Research

The iPhone sales, which is driven by installed base and upgrade cycle, are the most important metrics. According to Evercore ISI, there are 650M of new iPhone install base and ~250M used iPhone users, which has been the main driver of the increase in iPhone user base. Since the used device consumers are not the Company's enthusiasts (who have higher retention rate, higher customer lifetime value, and are more likely to buy other AAPL products/services), I disagree with the bulls' thesis that this customer segment will demand new iPhones and AAPL can effectively monetize new users via both services and wearable assets. These price-sensitive customers are likely to go with the most favorable trade-in plans even if they are Android devices and would not pay huge premium to buy other AAPL devices. I also would like to highlight that the iPhone replacement cycle has grown from ~30 months at the end of 2014 (iPhone 6) to ~39 months currently. With the structural increase in phone prices and limited improvements in functionality between different generations, I believe the replacement cycle will continue to be longer.



2. New businesses will escalate costs and cannibalize its revenue: With the launch of new initiatives such as Apple Arcade and Apple TV+, there is now an extended set of deep-pocketed competitors like Google, Tencent, Netflix, AT&T (HBO), and Amazon. As the portability of capability into new segments is over-estimated, AAPL will face a surge in developer costs and content spending with disappointing revenues. For instance, the Company has already spent $6B+, more than the original budget of $1B, on original-content deals. It will continue to burn more cash as it struggles to compete with Disney+, which already has industry leading content, and Netflix, which plans to spend $15B annually to retain its 160M subscribers. Sure, AAPL can leverage its install base. But so can Amazon, which has 100M+ sticky Prime members. Although I believe AAPL will gain a foothold in the new market, its ROIC will decline as the competition will be fierce.

Extrapolating from the competitors' margins, the gross margins of new service businesses are lower (20% for Apple TV+ and Apple Arcade, 40% for Apple News+). Thus, if these businesses grow as the Company touts, the current 64% services' gross margin will deteriorate. This is especially true when considering that new businesses will cannibalize its existing higher margin service revenue streams. For instance, 74% of App Store revenue, which I have estimated to have 85% gross margin, is games. With the increasing use of Apple Arcade, the game players will engage less with mobile games on the App Store and make less in-app purchases. Since I estimate that App Store constitutes 5% of total revenue, the cannibalization will shrink the overall margin. I think the similar cannibalization would occur with Beats and AirPods as well as Apple Music and iTunes.

	Historical					Projected				CAGR Growth		% of Total Sales		TAM		Mkt Share	
in US$M (except for unit ASP)	2015	2016	2017	2018	2019	2020E	2021E	2022E	2023E	15-19	19-23E	2019	2023E	2019	2023E	2019	2023E
Services Revenue	**$19,909**	**$24,348**	**$29,980**	**$37,190**	**$46,291**	**$51,408**	**$57,247**	**$63,910**	**$71,297**	***23.5%***	***11.4%***	***17.8%***	***22.6%***	**$613,923**	**$953,461**	***7.5%***	***7.5%***
growth YoY	*10.2%*	*22.3%*	*23.1%*	*24.0%*	*24.5%*	*11.1%*	*11.4%*	*11.6%*	*11.6%*								
vs. Consensus	--	--	--	--	--	*-4.4%*	*-3.9%*	*-3.3%*	*-14.5%*								
Licensing (80% gross margin)	$2,135	$3,095	$4,488	$6,508	$9,112	$11,663	$14,578	$17,494	$20,118	*45.0%*	*21.9%*	*3.5%*	*6.4%*	$333,250	$517,510	2.7%	3.9%
Google TAC (95% gross margin)	*$1,260*	*$2,320*	*$3,100*	*$4,248*	*$6,300*	*$8,190*	*$10,238*	*$12,285*	*$14,128*	*49.5%*	*22.4%*	*2.4%*	*4.5%*	*$15,424*	*$29,788*	*40.8%*	*47.4%*
App Store (85% gross margin)	$6,985	$9,080	$11,350	$11,529	$12,682	$12,428	$12,055	$11,814	$11,460	*16.1%*	-2.5%	*4.9%*	*3.6%*	$19,421	$19,100	65.3%	60.0%
Apple Music (15% gross margin)	$1,514	$2,119	$2,861	$3,719	$4,835	$6,043	$7,252	$8,340	$9,174	*33.7%*	17.4%	*1.9%*	*2.9%*	$34,527	$71,595	14.0%	12.8%
iTune Store (25% gross margin)	$5,169	$6,203	$7,134	$7,847	$8,632	$8,545	$8,289	$7,958	$7,560	*13.7%*	-3.3%	*3.3%*	*2.4%*	$44,885	$35,798	19.2%	21.1%
Apple Care (70% gross margin)	$2,726	$1,991	$1,641	$3,756	$4,132	$4,205	$4,320	$4,430	$4,721	*11.0%*	3.4%	*1.6%*	*1.5%*	--	--	--	--
Deferred (Maps, Siri, free iCloud)	$636	$795	$1,033	$1,860	$2,324	$2,317	$2,290	$2,255	$2,217	*38.3%*	-1.2%	*0.9%*	*0.7%*	--	--	--	--
iCloud (75% gross margin)	$681	$954	$1,287	$1,674	$2,025	$2,146	$2,232	$2,299	$2,345	31.3%	3.7%	0.8%	0.7%	$18,957	$32,355	10.7%	7.2%
Apple Pay (80% gross margin)	$63	$111	$186	$298	$461	$692	$1,003	$1,404	$1,938	64.3%	43.2%	0.2%	0.6%	$50,092	$95,808	0.9%	2.0%
Apple Card (70% gross margin)	--	--	--	--	$429	$901	$1,712	$3,081	$5,238	--	86.9%	0.2%	1.7%	$50,092	$95,808	0.9%	5.5%
Apple News+ (40% gross margin)	--	--	--	--	$391	$606	$879	$1,230	$1,661	--	43.6%	0.2%	0.5%	$21,510	$35,863	1.8%	4.6%
Apple TV+ (20% gross margin)	--	--	--	--	$852	$1,235	$1,729	$2,334	$3,151	--	38.7%	0.3%	1.0%	$24,248	$31,858	3.5%	9.9%
Apple Arcade (20% gross margin)	--	--	--	--	$417	$626	$907	$1,270	$1,714	--	42.4%	0.2%	0.5%	$16,941	$17,766	2.5%	9.6%

Catalyst (a timeline for the mispricing to correct)**:**

1. Sales miss in Q4 2020, with disappointing 5G iPhone sales, will lead to multiple compression : The street expects that AAPL's likely launch of 4 new iPhone models with 5G capabilties in September 2020 will reaccelerate sales. Note that Apple shares historically begin to outperform a year ahead of significant iPhone releases (with Apple's P/E multiple expanding 3.5x turns during the period). I believe 5G has been over-hyped by investors and AAPL will be unable to meet investors' high expectation. The Telecom operators globally are unable to justify the significant CapEx as they haven't been able to increase ARPU with new wireless networks. As a result, they will not scale the 5G infrastructure nationwide for the new network to have enough coverage and speed in the next few years until they are forced to do so in ~2 years to cope with growing data traffic. Even in Korea, the 1st country to deploy 5G, the 5G mobile users have expressed frustration with huge battery drain, and bugginess as the base stations have not been installed with enough density. Thus, I have modeled the iPhone revenue to be 3.4% below the consensus AAPL on my base scenario.

	Historical					Projected				CAGR Growth		% of Total Sales		TAM		Mkt Share	
in US$M (except for unit ASP)	2015	2016	2017	2018	2019	2020E	2021E	2022E	2023E	15-19	19-23E	2019	2023E	2019	2023E	2019	2023E
Products	**$213,806**	**$191,021**	**$199,254**	**$228,405**	**$213,883**	**$217,665**	**$223,625**	**$229,320**	**$244,368**	***0.0%***	***3.4%***	***82.2%***	***77.4%***	***$945,269***	***$1,050,025***	***22.6%***	***23.3%***
growth YoY	*27.9%*	*-10.7%*	*4.3%*	*14.6%*	*-6.4%*	*1.8%*	*2.7%*	*2.5%*	*6.6%*								
vs. Consensus	--	--	--	--	--	*-2.1%*	*-3.1%*	*-8.3%*	*-3.6%*								
iPhone Revenue	$155,041	$136,700	$141,319	$166,699	$142,381	$141,149	$138,567	$134,204	$135,258	*-2.1%*	*-1.3%*	*54.7%*	*42.8%*	$543,600	$633,023	*26.2%*	*21.4%*
YoY growth	*52.0%*	*-11.8%*	*3.4%*	*18.0%*	*-14.6%*	*-0.9%*	*-1.8%*	*-3.1%*	*0.8%*								
vs. Consensus	--	--	--	--	--	*-3.4%*	*-10.7%*	*-18.4%*	*-20.0%*								
% of TAM	28.4%	24.9%	25.3%	30.5%	26.2%	24.6%	23.3%	21.8%	21.4%								
iPhone installed base (in M)	**535**	**641**	**756**	**831**	**900**	**937**	**950**	**933**	**898**	***13.9%***	***0.0%***	**--**	**--**	**3,810**	**4,270**	**23.6%**	**21.0%**
growth YoY	--	*19.8%*	*17.9%*	*9.9%*	*8.3%*	*4.1%*	*1.4%*	*-1.8%*	*-3.7%*								
Units Sold (in M)	231	212	217	218	180	191	187	190	194	*-6.0%*	*1.8%*	--	--	1,800	1,910	***10.0%***	***10.1%***
vs. Consensus	--	--	--	--	--	-1.8%	-6.8%	-10.6%	-7.8%								
ASP	$671	$645	$652	$766	$789	$739	$741	$705	$698	*4.2%*	*-3.0%*	--	--	--	--	--	--
vs. Consensus	--	--	--	--	--	-1.6%	-4.2%	-8.8%	-13.3%								
iPhone Gross Profit	$57,830	$50,306	$51,581	$60,512	$50,972	$49,543	$48,221	$46,569	$46,664	*-3.1%*	*-2.2%*	--	--	--	--	--	--
iPhone Gross Margin	*37.3%*	*36.8%*	*36.5%*	*36.3%*	*35.8%*	*35.1%*	*34.8%*	*34.7%*	*34.5%*								

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Risk:

in US $Mn	Valuation Method	2021E Metrics	Multiple	Value	$/share	as % of Total
Hardware	P/E ex-net cash	$34,328	13.0x	$446,269	$107.68	43.7%
Software	P/E ex-net cash	$20,613	26.0x	$535,948	$129.32	52.5%
Net Cash	MV	$39,361	--	$39,361	$9.50	3.9%
Market Cap and Target Price				$1,021,578	$246.50	
Share Outstanding (in M)		4,144				

Unprecedented share-buybacks and strong pricing power: The Company has announced that it will achieve a net cash neutral position over 3 years. Thus, I valued AAPL using Sum of the Parts to consider that investors will get $34B of net cash at the end of 2021. It's derived with the consideration that 80% of FCFE will also be used for share buybacks and 20% of FCFE for dividend payments. I also recognize that AAPL has unparalleled loyal customer base who have high WTP for AAPL despite the limited functionality. Therefore, in my low scenario, I have projected a situation in which 5G iPhone sales and total revenue exceed investors' expectation by 7% and 11%, respectively. I have also assigned the probability of that happening to be 40%. Despite my conservative estimates, AAPL continues to be overvalued by 11%. Note that I didn't even apply conglomerate discount (although there are some synergies for having hardware and software, AAPL has numerous disparate businesses with limited disclosure, making it difficult for investors to forecast).

Valuation:

I applied P/E multiples on my 2021 estimates that are in line with peers (13x hardware and 25x software). While the Company has leading EBITDA margins and certain degree of durable competitive advantages, AAPL's total revenue declined by 2% in 2019. In addition, it is projected to grow only by 3.4% while other big software competitors are project to grow by 15% with similar industry tailwinds. Considering these, I believe AAPL's mispricing could be bigger than what I have quantified.

(US$Bn)	Equity Value	Enterprise Value	Rev growth 2019 YoY	Rev growth 2020 est	EBITDA Margin	LTM EV/EBITDA	LTM P/E	LTM FCF Yield	LTM ROIC	P/E ex-net cash 2020
Samsung Electronics	$300	$236	-5.5%	7.9%	25.7%	4.1x	18.0x	6.8%	16.1%	14.1x
Dell	$37	$86	14.7%	1.8%	11.6%	8.2x	-0.4x	17.0%	-0.8%	6.5x
HP	$29	$30	0.5%	-1.3%	8.4%	5.9x	11.2x	13.7%	9.4%	8.8x
LVMH	$223	$247	14.6%	5.4%	30.9%	13.3x	27.1x	4.4%	13.6%	25.0x
Sony	$86	$84	-2.1%	-1.4%	16.0%	6.7x	10.5x	9.8%	14.5%	16.5x
Hardware Peers	**$135**	**$137**	**4.4%**	**2.5%**	**18.5%**	**7.6x**	**13.3x**	**10.4%**	**10.6%**	**14.2x**
Apple Hardware	--	--	-6.4%	1.8%	23.8%	--	--	--	--	--
Total Apple	$1,396	$1,306	-2.0%	3.4%	29.4%	16.6x	22.7x	4.2%	24.7%	22.9x
Apple Software	--	--	24.5%	11.1%	55.3%	--	--	--	--	--
Software Peers	**$834**	**$799**	**19.0%**	**11.9%**	**37.5%**	**19.0x**	**30.9x**	**2.4%**	**18.1%**	**24.9x**
Google	$1,044	$940	18.3%	-3.8%	30.6%	19.4x	31.2x	3.0%	14.8%	21.4x
Microsoft	$1,420	$1,373	14.0%	13.2%	47.1%	21.7x	34.1x	2.9%	21.5%	31.5x
Disney	$250	$309	17.1%	16.9%	21.6%	19.0x	32.9x	0.4%	8.1%	27.2x
Facebook	$620	$575	26.6%	21.2%	50.7%	16.0x	25.2x	3.4%	27.8%	19.7x

Exhibit 1 - **Product Revenue breakdown:** Volume and average selling prices of AAPL devices/services are not publicly disclosed. These numbers what I have extrapolated from my deep fundamental research.

	Historical					Projected				CAGR Growth		% of Total Sales		TAM		Mkt Share	
in US$M (except for unit ASP)	2015	2016	2017	2018	2019	2020E	2021E	2022E	2023E	15-19	19-23E	2019	2023E	2019	2023E	2019	2023E
iPad Revenue	$23,227	$20,628	$19,222	$18,805	$21,280	$20,633	$20,006	$19,398	$18,808	-2.2%	-3.0%	8.2%	6.0%	$50,206	$44,379	42.4%	42.4%
iPad Units Sold (in M)	55	46	44	44	45	43	41	40	38	-4.8%	-4.0%	--	--	--	--	--	--
iPad ASP	$423	$452	$439	$432	$473	$478	$482	$487	$492	2.8%	1.0%	--	--	--	--	--	--
iPad Gross Profit	$5,714	$5,157	$4,690	$4,795	$5,384	$4,952	$4,601	$4,170	$3,762	-1.5%	-8.6%	--	--	--	--	--	--
iPad Gross Margin	*24.6%*	*25.0%*	*24.4%*	*25.5%*	*25.3%*	*24.0%*	*23.0%*	*21.5%*	*20.0%*	--	--	--	--	--	--	--	--
Mac Revenue	$25,471	$22,831	$25,850	$25,484	$25,740	$24,751	$25,122	$24,083	$23,006	0.3%	-2.8%	9.9%	7.3%	$312,600	$296,965	8.2%	7.7%
Mac Units Sold (in M)	21	18	19	18	19	18	18	17	16	-2.0%	-4.2%	--	--	--	--	--	--
Mac ASP	$1,237	$1,235	$1,343	$1,400	$1,355	$1,375	$1,396	$1,417	$1,438	2.3%	1.5%	--	--	--	--	--	--
Mac Gross Profit	$6,495	$5,708	$6,359	$6,473	$6,512	$6,064	$5,904	$5,539	$5,061	0.1%	-6.1%	--	--	--	--	--	--
Mac Gross Margin	*25.5%*	*25.0%*	*24.6%*	*25.4%*	*25.3%*	*24.5%*	*23.5%*	*23.0%*	*22.0%*	--	--	--	--	--	--	--	--
Wearables, Home, Accessories	$10,067	$11,132	$12,826	$17,381	$24,482	$31,131	$39,929	$51,636	$67,296	24.9%	28.8%	9.4%	21.3%				
Apple Watch Revenue	$3,185	$5,104	$7,072	$9,218	$13,113	$15,758	$18,936	$22,756	$27,346	42.4%	20.2%	5.0%	8.7%	$19,324	$43,800	67.9%	62.4%
Apple Watch Units Sold (M)	7	11	17	22	31	38	46	56	69	45.1%	22.0%	--	--	--	--	--	--
Apple Watch ASP	$455	$464	$416	$419	$423	$417	$410	$404	$398	-1.8%	-1.5%	--	--	--	--	--	--
Beats Revenue	$1,158	$1,351	$1,367	$1,402	$1,397	$1,404	$1,411	$1,418	$1,425	4.8%	0.5%	0.5%	0.5%	$19,539	$31,858	7.1%	4.5%
Airpods Revenue	--	--	$1,034	$2,099	$9,900	$13,899	$19,512	$27,393	$38,457	209.5%	40.4%	3.8%	12.2%	$19,539	$31,858	50.7%	120.7%
Airpods Units Sold (M)	--	--	7	12	55	76	106	148	205	190.9%	39.0%	--	--	--	--	--	--
Airpods ASP	--	--	$159	$175	$180	$182	$184	$185	$187	6.4%	1.0%	--	--	--	--	--	--
AirPods Gross Profit	--	--	$341	$695	$3,307	$4,698	$6,634	$9,368	$13,268	211.4%	3.0%	--	--	--	--	--	--
AirPods Margin	--	--	*33.0%*	*33.1%*	*33.4%*	*33.8%*	*34.0%*	*34.2%*	*34.5%*	--	--	--	--	--	--	--	--
Other (TV, Homepod, charger)	$4,812	$4,015	$2,921	$4,606	$72	$71	$70	$69	$68	-65.0%	-1.5%	--	--	--	--	--	--
iPod Revenue	$912	$662	$433	$56	$0	$0	$0	$0	$0	--	--	--	--	--	--	--	--

Exhibit 2 – **3 Statements:** I've aggregated gross profits by businesses (hardware vs. software) and allocated operating expenses and taxes as I saw fit.

Income Statement	Historical					Projected				CAGR Growth	
in M (except unit avg ASP)	2015	2016	2017	2018	2019	2020E	2021E	2022E	2023E	15-19	19-23E
Total Revenue	$233,715	$215,369	$229,234	$265,595	$260,174	$269,072	$280,871	$293,230	$315,665	2.7%	5.0%
% growth (YoY)	*27.9%*	*-7.8%*	*6.4%*	*15.9%*	*-2.0%*	*3.4%*	*4.4%*	*4.4%*	*7.7%*	--	--
vs. Consensus	--	--	--	--	--	*-1.6%*	*-4.9%*	*-5.5%*	*-3.8%*	--	--
COGS	$140,089	$163,756	$141,048	$131,376	$161,782	$169,435	$177,727	$186,074	$201,602	3.7%	5.7%
GP	**$93,626**	**$51,613**	**$88,186**	**$134,219**	**$98,392**	**$99,637**	**$103,144**	**$107,156**	**$114,062**	**1.2%**	**3.8%**
Gross Margin	***40.1%***	***24.0%***	***38.5%***	***50.5%***	***37.8%***	***37.0%***	***36.7%***	***36.5%***	***36.1%***		
R&D Expense	$8,067	$10,045	$11,581	$14,236	$16,217	$13,325	$14,752	$15,746	$17,152	19.1%	1.4%
SG&A	$14,329	$14,194	$15,261	$16,705	$18,245	$17,587	$18,586	$19,420	$20,883	6.2%	3.4%
EBIT	**$71,230**	**$27,374**	**$61,344**	**$103,278**	**$63,930**	**$68,725**	**$69,806**	**$71,990**	**$76,027**	**-2.7%**	**4.4%**
operating margin	***30.5%***	***12.7%***	***26.8%***	***38.9%***	***24.6%***	***25.5%***	***24.9%***	***24.6%***	***24.1%***	--	--
Interest Expense	($733)	($1,456)	($2,323)	($3,240)	($3,576)	($2,443)	($2,257)	($2,191)	($1,732)	48.6%	-16.6%
interest rate	*1.3%*	*1.8%*	*2.2%*	*3.2%*	*3.5%*	*2.4%*	*2.4%*	*2.4%*	*2.4%*	--	--
Interest and Dividend Income	$2,921	$1,348	$2,745	$2,005	$4,961	$2,579	$1,600	$1,139	$918	14.2%	
interest rate	*1.4%*	*0.6%*	*1.0%*	*0.8%*	*2.4%*	*1.3%*	*1.3%*	*1.3%*	*1.3%*	--	--
Other expense, net	($903)	($1,195)	($133)	($441)	$422	($540)	($563)	($588)	($633)	--	--
Net non-operating income (expen	$1,285	$33,998	$2,745	($30,375)	$1,807	$1,496	$1,480	$1,463	$1,446	--	--
EBT	$72,515	$61,372	$64,089	$72,903	$65,737	$68,321	$68,359	$73,453	$77,473	2.4%	3.2%
Provision for income taxes	$19,121	$15,685	$15,738	$13,372	$10,481	$15,136	$15,194	$15,585	$16,522	-14.0%	12.1%
Effective tax rate	*26.4%*	*25.6%*	*24.6%*	*18.3%*	*15.9%*	*22.2%*	*22.2%*	*22.2%*	*22.2%*	-11.8%	--
Net Income	**$53,394**	**$45,687**	**$48,351**	**$59,531**	**$55,256**	**$53,186**	**$53,391**	**$54,765**	**$58,057**	**0.9%**	**1.2%**
S/O *(in M)*	5,753	5,471	5,217	4,955	4,618	4,343	4,098	3,849	3,699	-5.3%	-5.4%
EPS	**$9.28**	**$8.35**	**$9.27**	**$12.01**	**$11.97**	**$12.25**	**$13.03**	**$14.23**	**$15.69**	**6.6%**	**7.0%**

Balance Sheet	Historical		Projected			
Current Asset	2018	2019	2020E	2021E	2022E	2023E
Cash and cash equivalents	$25,913	$48,844	$29,546	$17,101	$4,191	$10,732
Marketable Securities	$40,388	$51,713	$51,713	$51,713	$51,713	$51,713
A/R, net	$23,186	$22,926	$23,590	$24,624	$25,708	$27,675
Inventories	$3,956	$4,106	$4,068	$4,428	$4,551	$4,961
Vendor non-trade receivables	$25,809	$22,878	$24,904	$25,996	$27,140	$29,216
Other CA	$12,087	$12,352	$12,352	$12,352	$12,352	$12,352
Non-Current Asset						
Marketable Securities (AFS)	$170,799	$105,341	$85,272	$58,903	$35,047	$10,799
PP&E, net	$41,304	$37,378	$38,535	$39,859	$41,421	$43,055
Other non-CA	$22,283	$32,978	$32,978	$32,978	$32,978	$32,978
Total Assets	**$365,725**	**$338,516**	**$302,958**	**$267,954**	**$235,100**	**$223,480**
Current Liabilities						
A/P	$55,888	$46,236	$60,251	$63,199	$66,168	$71,689
Other CL	$33,327	$37,720	$37,720	$37,720	$37,720	$37,720
Deferred Revenue	$5,966	$5,522	$5,877	$6,135	$6,405	$6,895
Commercial Paper	$11,964	$5,980	$9,500	$12,053	$17,432	$9,015
Term Debt	$8,784	$10,260	$10,270	$8,125	$10,603	$10,329
Non-Current Liabilties						
Term Debt	$93,735	$91,807	$81,537	$73,412	$62,809	$52,480
Other non-CL	$48,914	$50,503	$50,503	$50,503	$50,503	$50,503
Total Liabilties	**$258,578**	**$248,028**	**$255,658**	**$251,148**	**$251,640**	**$238,632**
S/E						
CS and APIC	**$40,201**	**$45,174**	**$50,525**	**$56,366**	**$62,537**	**$69,176**
SBC	$5,443	$6,194	$5,351	$5,841	$6,171	$6,639
R/E	**$70,400**	**$45,898**	**-$2,631**	**-$40,485**	**-$78,600**	**-$85,163**
NI	$59,531	$55,256	$53,186	$53,391	$54,765	$58,057
Dividends declared	-$13,735	-$14,129	-$13,820	-$11,726	-$12,052	-$12,924
CS repurchased	-$73,056	-$67,101	-$87,895	-$79,520	-$80,827	-$51,697
AOCI (loss)	-$3,454	-$584	-$584	$1,043	-$22	-$312
Total S/E	**$107,147**	**$90,488**	**$47,310**	**$16,923**	**-$16,085**	**-$16,299**
Total Liabilties and S/E	**$365,725**	**$338,516**	**$302,958**	**$267,954**	**$235,100**	**$223,480**
A/R Days	31.9	32.2	32.0	32.0	32.0	32.0
Inventory Days	43.2	40.1	41.6	40.1	40.9	40.6
Vendor non-trade receivables	35.5	32.1	33.8	33.8	33.8	33.8
A/P Days	155.3	104.3	129.8	129.8	129.8	129.8

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Cash Flow Statement	Historical					Projected			
in $M	2015	2016	2017	2018	2019	2020E	2021E	2022E	2023E
Net Income	53,394	45,687	48,351	59,531	55,256	53,186	53,391	54,765	58,057
+D&A	11,257	10,505	10,157	10,903	12,547	12,406	12,834	13,218	14,278
+SBC	3,586	4,210	4,840	5,340	6,068	5,351	5,841	6,171	6,639
+ Total Changes in operating A&L	8,768	28,792	(4,923)	34,694	(3,488)	11,718	720	889	1,558
CFO	**81,266**	**66,231**	**64,225**	**77,434**	**69,391**	**82,661**	**72,786**	**75,042**	**80,532**
CapEx	(11,247)	(12,734)	(12,451)	(13,313)	(10,495)	(13,563)	(14,157)	(14,780)	(15,911)
FCFE	**70,019**	**53,497**	**51,774**	**64,121**	**58,896**	**69,098**	**58,628**	**60,262**	**64,621**
-purchase + proceeds from mkt sec	(44,417)	(30,634)	(33,147)	32,363	57,460	20,069	26,369	23,856	24,248
+Debt Issuance - repayment of deb	27,114	22,454	25,162	469	(1,842)	(6,750)	(6,197)	(4,149)	(17,707)
- Dividends Paid	(11,561)	(12,150)	(12,769)	(13,712)	(14,119)	(13,820)	(11,726)	(12,052)	(12,924)
- Share buybacks	(35,253)	(29,722)	(32,900)	(72,738)	(66,897)	(87,895)	(79,520)	(80,827)	(51,697)
Net Change in Cash	**7,276**	**(636)**	**(195)**	**5,624**	**33,498**	**(19,298)**	**(12,445)**	**(12,910)**	**6,541**
EB Cash	**205,666**	**237,585**	**268,895**	**237,100**	**205,898**	**166,531**	**127,717**	**90,951**	**73,244**
Total Debt	55,963	78,927	103,703	102,519	102,067	101,307	93,590	90,844	71,824
Net Cash	**149,703**	**158,658**	**165,192**	**134,581**	**103,831**	**65,224**	**34,127**	**107**	**1,420**
EBITDA	**82,487**	**37,879**	**71,501**	**114,181**	**76,477**	**81,131**	**82,640**	**85,208**	**90,305**
Debt / EBITDA	0.7x	2.1x	1.5x	0.9x	1.3x	1.2x	1.1x	1.1x	0.8x

Exhibit 3 – **Revenue by geography:** November handset data that showed 5G ramp led to AAPL's share loss in China. units grew by 5.8% while the iPhone units were down 35% YoY. As Chinese carriers and OEMs ramp 5G aggressively, I believe AAPL's promotional efforts to increase 5G phones will be diluted. Moreover, I believe tensions between China and US will persist in 2020, posting a threat to the revenue stream that constitutes 17% of AAPL's total revenue. Since the EBIT margin of China is greater than that of US (37% vs. 30%), I believe AAPL's continued weakness in China will compress the Company's total margin and multiples.

	in US$M	Historical					Projected				CAGR Growth		% of Total Revenue	
		2015	2016	2017	2018	2019	2020E	2021E	2022E	2023E	15-19	19-23E	2019	2023E
Americas	Revenue	$93,864	$86,613	$96,600	$112,093	$116,914	$118,083	$122,806	$128,947	$127,657	5.6%	2.6%	44.9%	42.6%
	YoY growth	--	*-7.7%*	*11.5%*	*16.0%*	*4.3%*	*1.0%*	*4.0%*	*5.0%*	*-1.0%*	--	--	--	--
	vs. Consensus	--	--	--	--	--	*-2.0%*	*-4.1%*	*-1.2%*	*-2.2%*	--	--	--	--
	EBIT	$31,186	$28,172	$30,684	$34,684	$35,099	$36,606	$38,684	$41,263	$41,489	3.0%	4.3%	13.5%	13.8%
	EBIT Margin	*33.2%*	*32.5%*	*31.8%*	*30.9%*	*30.0%*	*31.0%*	*31.5%*	*32.0%*	*32.5%*	--	--	--	--
China	Revenue	$58,715	$48,492	$44,764	$51,942	$43,678	$38,000	$34,200	$31,464	$29,576	-7.1%	-8.0%	16.8%	9.9%
	YoY growth	--	*-17.4%*	*-7.7%*	*16.0%*	*-15.9%*	*-13.0%*	*-10.0%*	*-8.0%*	*-6.0%*	--	--	--	--
	vs. Consensus	--	--	--	--	--	*-5.4%*	*-36.7%*	*-35.4%*	*-39.3%*	--	--	--	--
	EBIT	$23,002	$18,835	$17,032	$19,742	$16,232	$13,870	$12,312	$11,170	$10,204	-8.3%	-9.7%	6.2%	3.4%
	EBIT Margin	*39.2%*	*38.8%*	*38.0%*	*38.0%*	*37.2%*	*36.5%*	*36.0%*	*35.5%*	*34.5%*	--	--	--	--
Japan	Revenue	$15,706	$16,928	$17,733	$21,733	$21,506	$21,721	$22,590	$23,268	$23,733	8.2%	3.0%	8.3%	7.2%
	YoY growth		*7.8%*	*4.8%*	*22.6%*	*-1.0%*	*1.0%*	*4.0%*	*3.0%*	*2.0%*	--	--	--	--
	vs. Consensus	--	--	--	--	--	*-1.8%*	*-4.0%*	*-2.9%*	*-0.9%*	--	--	--	--
	EBIT	$7,617	$7,165	$8,097	$9,500	$9,369	$9,123	$9,375	$9,540	$9,612	5.3%	1.8%	3.6%	3.1%
	EBIT Margin	*48.5%*	*42.3%*	*45.7%*	*43.7%*	*43.6%*	*42.0%*	*41.5%*	*41.0%*	*40.5%*	--	--	--	--

3.2x R/R & 37% IRR Compelling **Contrarian** Pitch

*Refuting Bulls' Core Thesis based on **Differentiated** Research*

Central tenets of my thesis

1. Concorde Agreement, the winning formula that market presumes will unlock F1 value, will **hurt the business in the long run by making the sport unpopular** *(Contrarian: 10, Conviction: 8)*
2. Business model is unsustainable; it will **lose market share to competitors** and have **revenue growth decelerate** *(Contrarian: 9, Conviction: 9)*
3. F1 is already over-monetized; **opportunities are close to saturation** *(Contrarian: 7, Conviction: 10)*

UNWAVERING CAPITAL™

Differentiated Deep Fundamental Diligence

400+ Hours of Scuttlebutt

Recommendation: Monetize the range stock

Short > $25, Trim <$22, Exit at $18-$20

	FWONK share price	Weight
As of Aug 11, '20	$37.18	
Price Target	**$20.11**	**100%**
Upside/Downside	*84.9%*	
IRR	**36.9%**	
From DCF	$18.35	50%
From EBITDAx 21E	$21.87	50%

Scoring the Trade (Rate from 1 to 10)			
Setup	Conviction	Mid/LT View	Event liquidity
7	8	9	8
Overall Setup		8	

Probability	30%	50%	20%
	Bear	Base	Bull
21E Total Revenue	**$2,013M**	**$2,106M**	**$2,226M**
vs. Consensus	*-6.4%*	*-2.0%*	*3.6%*
Total Revenue / race	**$101M**	**$100M**	**$101M**
21E Adj. EBITDA	**$382M**	**$492M**	**$557M**
vs. Consensus	*-22.0%*	*0.4%*	*13.5%*
EBITDA Margin	***19.0%***	***23.4%***	***25.0%***
Forward EBITDAx	14x	20x	20x
Ent Value *(in US$M)*	**$5,354**	**$9,846**	**$11,132**
Market Value *(in US$M)*	$1,781	$6,273	$7,559
Target Price	**$7.52**	**$26.47**	**$31.89**
Upside/Downside	*-79.8%*	*-28.8%*	*-14.2%*
Weighted Avg. TP		**$21.87**	
Upside/Downside		*-41.2%*	
Risk/Reward Ratio		**3.2x**	

Bulls' Thesis: Liberty will Turnaround F1

*Liberty will make F1 popular again by monetizing ads, host fees, and TV rights as well as implementing new **Concorde Agreement (C.A.)**, which sets F1 Rules (tech & financial)*

Old C.A. *('13-'22)*

New C.A. *('22-'26)*

Team Spending

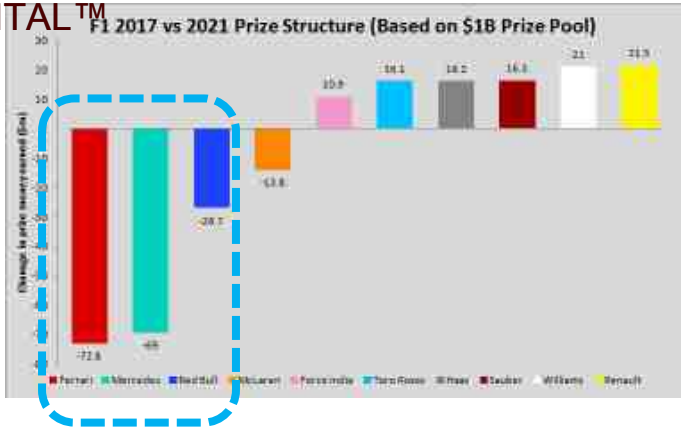
F1 TEAM FINANCES

	Revenue	Costs	Net profit/loss
Ferrari*	£382.0m	-£464.0m	-£82.0m
Force India Formula One Team	£81.4m	-£109.1m	-£11.6m
Haas Formula	£100.0m	-£94.9m	£4.1m
Haas Formula Italia	£6.9m	-£6.2m	£0.4m
McLaren Racing	£190.3m	-£193.6m	-£3.2m
Mercedes-Benz Grand Prix	£289.4m	-£275.1m	-£3.8m
Mercedes AMG High Performance Powertrains	£140.4m	-£126.9m	£1.5m
Red Bull Technology	£247.8m	-£238.1m	£8.4m
Renault Sport Racing (UK)	£119.1m	-£121.0m	
Renault Sport Racing (France)	£191.1m	-£197.5m	
Sauber Motorsport**	n/a	n/a	n/a
Scuderia Toro Rosso	£127.3m	-£124.8m	£1.5m
Williams Grand Prix Engineering	£177.7m	-£170.8m	£5.9m
TOTAL	£2,053.4m	-£2,122.0m	-£90.9m

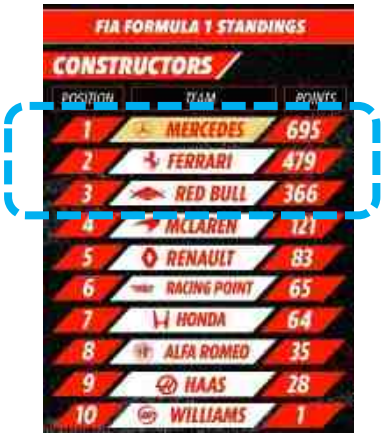
Implement budget cap: in '21 to $145M

Reduce Revenue Share: Now team payments is 68% of F1's pre-team EBITDA

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Competition



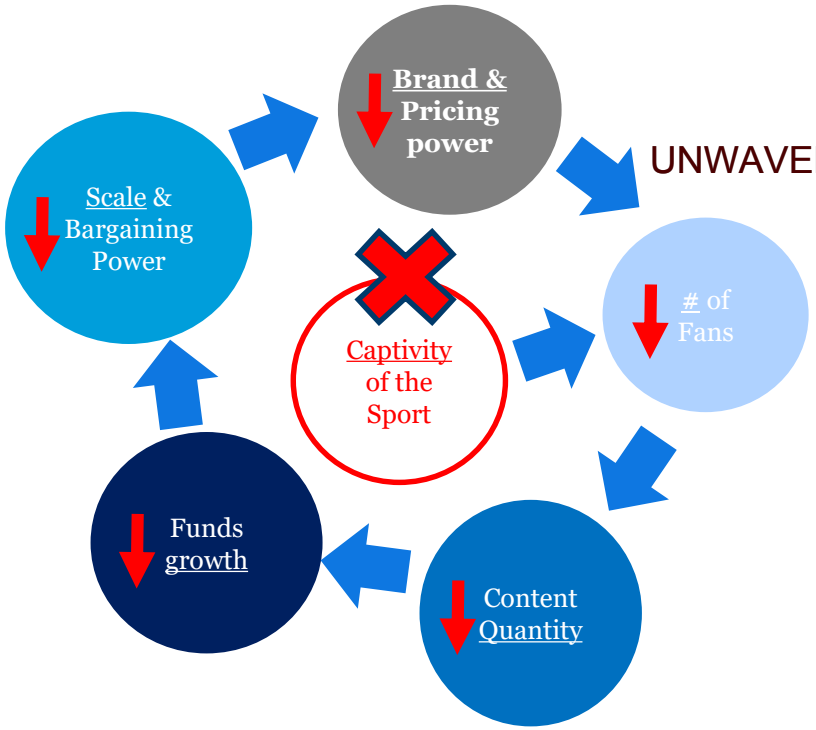
Achieve Team Parity:
Also more technical rules

Source: https://www.autosport.com/f1/news/129388/formula-1-team-payments-for-2017-revealed
https://www.forbes.com/sites/csylt/2020/05/16/f1s-1-billion-engine-costs-need-to-reverse-says-team-boss/#2c613ad86c15

Thesis 1: Concorde Agreement will make F1 Unpopular

*C.A. saves F1 money by reducing Team Payment. But in the LT, F1 will lose **fans***

*If C.A. leads to a fall in fan captivity, F1's key revenue driver, bulls' **core thesis is refuted***



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Black Swan

Rare but extremely impactful events can unhinge an otherwise bulls' strong investment thesis

C.A. is like putting a regular *gas (brand dilution)* into a Lamborghini to save cost, overlooking the **lasting damages** it could have on its engine *(F1's popularity)*

https://theundefeated.com/features/eliminating-the-nba-salary-cap-could-do-away-with-superteams-like-the-warriors/
https://www.autosport.com/f1/news/120142/full-f1-fan-survey-results-revealed

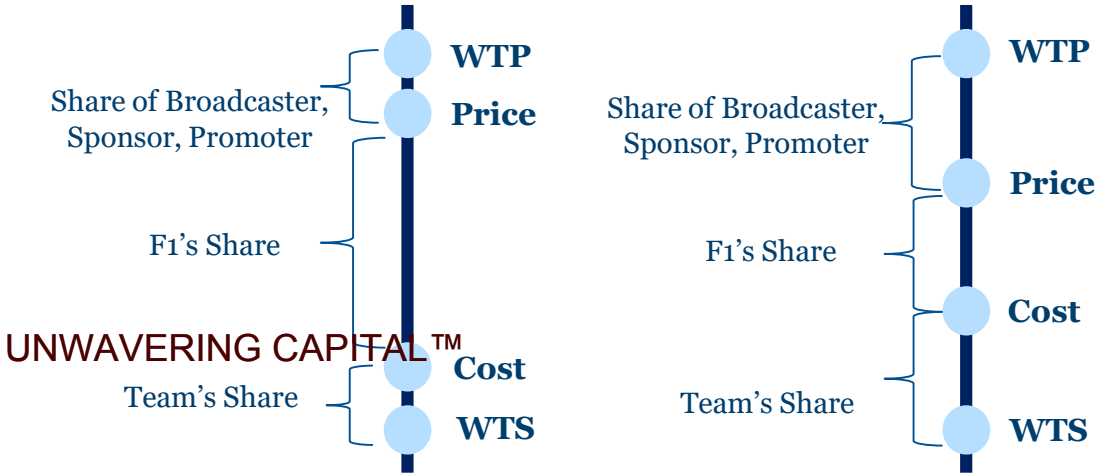
Thesis 2:

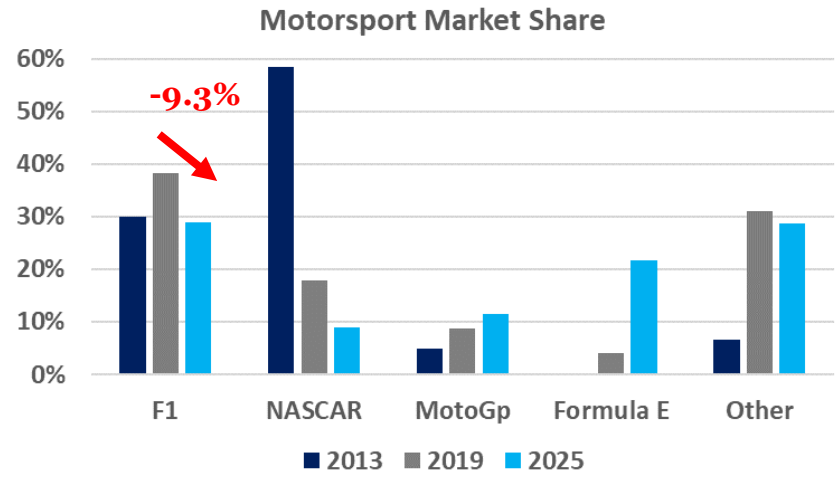
Contrarian**: 9, **Conviction:** 10, **ST/MT

F1 is extracting too much value from its stakeholders

It will need to share more of its profits with others or it will lose market share to competitors; with High DOL, F1's Revenue can Crash

Race (Unit) Economics *(in US$M)*	
	F1
Direct Revenues per Race	
TV rights	$35.9
Hosting Fee	$28.8
Ads	$14.5
Other (hospitality)	$17.0
Direct Revenue per race	**$96.3**
Variable Expenses per Race	
Total COGS / Race	$66.4
Team Payments (SG&A)	$6.2
Total Variable COGS/race	**$72.6**
Gross Profit / race	$23.7
Contribution Margin/race	**$23.7**
Race Break-Even Analysis	
Fixed Costs per Race	
Team Payments (SG&A)	$3.8
D&A	$21.6
Total Fixed Expenses /Race	**$25.4**
Break-Even Races	**1.1**
as % of Total Costs	
Fixed Costs	26%
Variable Costs	74%
Operating Income	**(35)**
Operating Margin	*-1.7%*
DOL	**(0.68)**
Changes in EBIT w/ a 10% Decrease in Sales	**-6.8%**





Thesis 2: F1 will lose Market Share or its Revenue will plummet

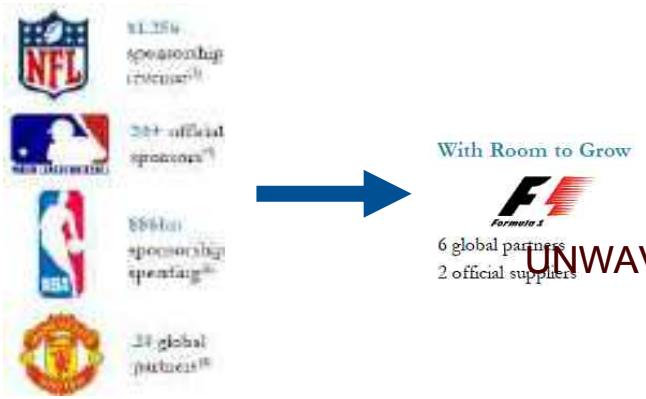
Thesis 3:

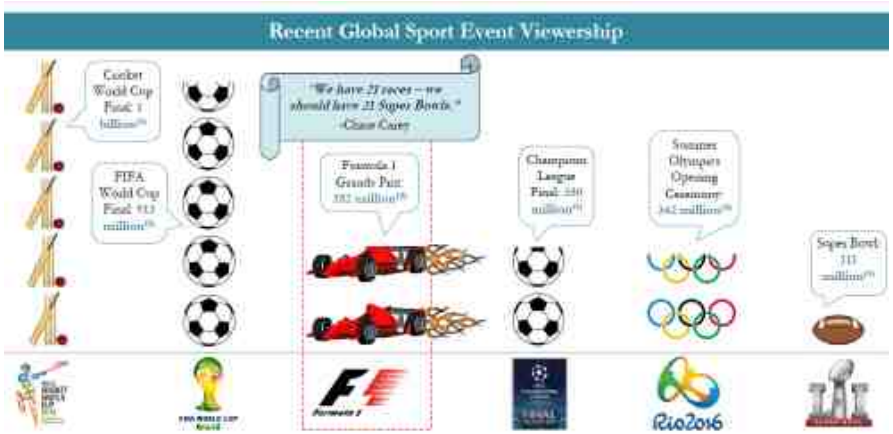
Contrarian**: 7, **Conviction:** 10, **ST/MT

F1 is the Most Monetized Sport although it's #7 in Popularity

With limited upside, FWONK is on track to revenue growth deceleration

***& Consensus Claim:** F1 has great upside*





Reality: F1 has hit the Revenue Ceiling

Monetization KPIs (Efficiency, Pricing Power, Popularity of Sport)

League	Total Rev/Fan	Total Rev/Match	Total Broadcasting Rev/Hour	Sponsorship Rev / Team	Ticketing Rev / # of Attendee
NBA	$0.12	$4K	915K	$43K	$47
NFL	$0.05	$49K	8,534K	$41K	$280
MLB	$0.06	$4K	203K	$31K	$9
WWE	$0.05	$2K	212K	$1K	$147
Nascar	$0.02	$40K	3,556K	$73K	$229
All League Avg	$0.05	$24K	4,686K	$48K	$103
FWONK	$4.04	$96K	5,985K	$75K	$151
Racing Avg	$0.05	$20K	5,401K	$23K	$129

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"The analyst' job is to be creative. Everything else I can outsource to India"
– John Griffin

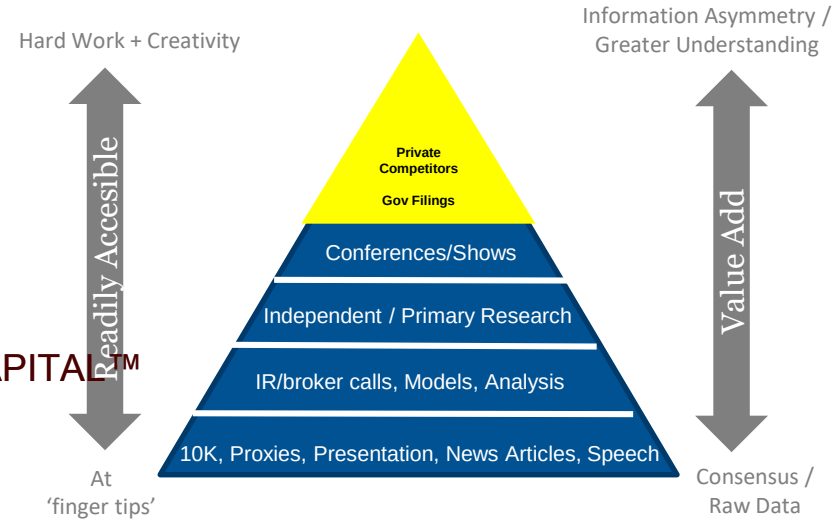
I've **Edges** in Earnings Forecast & Sentiment

*Value-Add-Research Learned from Working at a **Tiger Cub (ex-Blue Ridge)***

1) Gauge Buyside Bogey/Consensus: Spoke to analysts at Lone Pine and FIL to assess setup, positioning, and event liquidity

2) 9 Expert Interviews: After gaining an in-depth understanding of the company and the space, I spoke to Liberty Media Chief Portfolio Officer and ex-Head of F1 Media Rights Sale etc.

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3) 400+ hours of Mosaic Theory Application: Market Info inefficiencies arose because F1's hundreds of contracts unique and undisclosed. I scrutinized 30+ documents including Singaporean government filing to find race promotion fee amount and BK Racing's Bankruptcy paperwork to compare NASCAR's (private company) team unit economics to that of F1

"Do valuation first to see if it's worth your time to look more into the stock"
- Soren Gandrud

Expectations Investing: What is the market pricing in?

Superior Residual Returns from Revised Expectations in the Step-Up Rate

Ticker	FWONK
	FWONK US Equity
Current EV	$10,537
Discount Rate	7.1%
Years to TV	10
Future TV	$20,942
Year 10 FCF	$1,070
Terminal Growth Rate	2.0%
Year 10 FCF Margin	17.8%
Year 10 Revenue	$6,013
Current Year Revenue	1432.714
Revenue CAGR	15%
High Growth Phase (Years)	2
Required 2-year CAGR	8.0%
Implied 3-10 CAGR	17%

- Market is valuing FWONK like a growth stock, with an implied 17% CAGR from year 3 to 10 *(F1's past 3 year CAGR is 3%)*

- Reverse DCF shows that **75% of FWONK's PV is derived from the terminal value**.

	Bear	Base	Bull
# of Races in '21	**20**	**21**	**22**
21E Promotion Fee	**$581M**	**$622M**	**$672M**
vs. Consensus	*-10.9%*	*-4.5%*	*3.0%*
Escalator/Renewal Rate ('22-'30)	*-3.0%*	*1.0%*	*3.0%*
YoY % growth ('19 to'21)	*-4.0%*	*2.9%*	*11.0%*
Promtion Fee / Race	**$29M**	**$45M**	**$31M**
21E Broadcasting Revenue	**$792M**	**$822M**	**$867M**
vs. Consensus	*-4.8%*	*-1.2%*	*4.3%*
Escalator/Renewal Rate ('22-'30)	*3.0%*	*7.5%*	*13.0%*
YoY % growth ('19 to'21)	*5.0%*	*9.0%*	*15.0%*
Broadcasting Rev. / Race	**$40M**	**$39M**	**$39M**
21E Sponsorship Revenue	**$302M**	**$313M**	**$317M**
vs. Consensus	*-13.5%*	*-10.5%*	*-9.2%*
Escalator/Renewal Rate ('22-'30)	*-3.0%*	*1.5%*	*3.0%*
YoY % growth ('19 to'21)	*-1.0%*	*2.5%*	*4.0%*
Sponsorship / Race	**$15M**	**$15M**	**$14M**
21E Secondary Revenue	**$322M**	**$337M**	**$354M**
vs. Consensus	*-7.7%*	*-3.6%*	*1.5%*
Escalator/Renewal Rate ('22-'30)	*-4.0%*	*-2.0%*	*4.0%*
YoY % growth ('19 to'21)	*-10.0%*	*-6.0%*	*-1.0%*
Secondary Revenue /Race	**$16M**	**$16M**	**$16M**
21E OIBDA	**$101M**	**$178M**	**$267M**
vs. Consensus	*-80.6%*	*-65.7%*	*-48.4%*
OIBDA Margin	*5.0%*	*8.4%*	*12.0%*

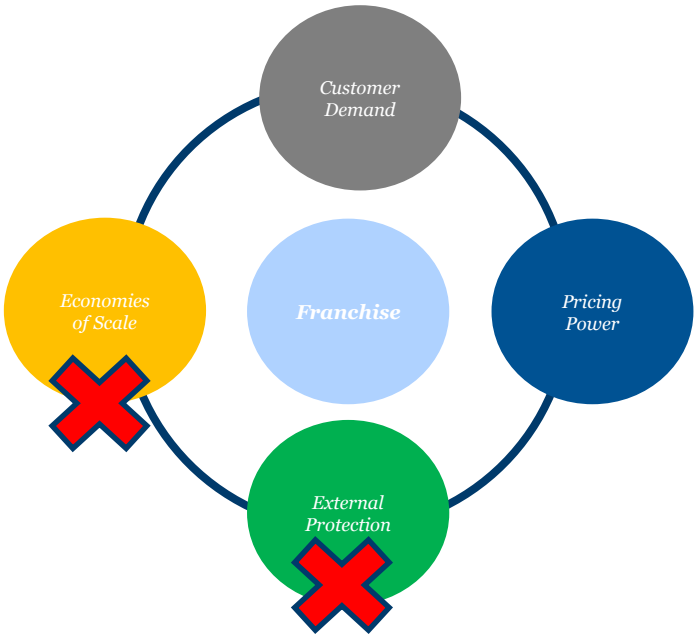
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My Controversial *Divergent* Views on Key Debates

My Variant views on the Conventional Concepts relate to F1's key value drivers

Competitive Advantages (Firm's ability to *currently* earn excess profits over its competitors)	≠	**Economic Moat** (Durability of competitive advantages)	≠	**Barrier to Entry** (The most important force that determines the competitive intensity & profitability)

1 F1 doesn't have economic moat: F1's brand is an illusory moat



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- **Franchise value only strengthens when these 4 are connected.** If one link weakens, the competition will catch up
- F1 doesn't have patents and the **entrant doesn't need license** from governing bodies like FIA.

- Race with your own car with others'. Film it with your phone and put it on YouTube and create your own governing body. NASCAR was started by bootleggers.
- **Economies of scale is no longer a roadblock:** Formula E was started without any asset/foundation given plenty of PE dry powder.

FWONK Destroys Equity Value: ROIC -4% < WACC 7%

Operational Value Drivers where I've identified "Expectations Opportunities"

- -4% ROIC and -$821M EVA also indicate that **economic moat doesn't exist** and FWONK is **destroying shareholder wealth**

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
ROIC	6.5%	-1.3%	-0.8%	0.0%	-3.8%	-1.5%	0.2%	0.3%	0.3%	0.3%	0.2%	0.2%	0.1%	0.1%	0.1%
EVA	-$19M	$990M	-$860M	-$821M	-$975M	-$762M	-$618M	-$605M	-$616M	-$610M	-$613M	-$616M	-$619M	-$632M	-$627M
ROE	14.8%	-0.3%	-1.0%	-0.3%	-4.0%	-1.7%	-0.1%	0.0%	0.0%	-0.1%	-0.1%	-0.2%	-0.2%	-0.3%	-0.3%
ROCE	14.9%	-0.3%	-1.0%	-0.3%	-4.2%	-1.8%	-0.1%	0.0%	0.0%	-0.1%	-0.1%	-0.1%	-0.2%	-0.2%	-0.3%

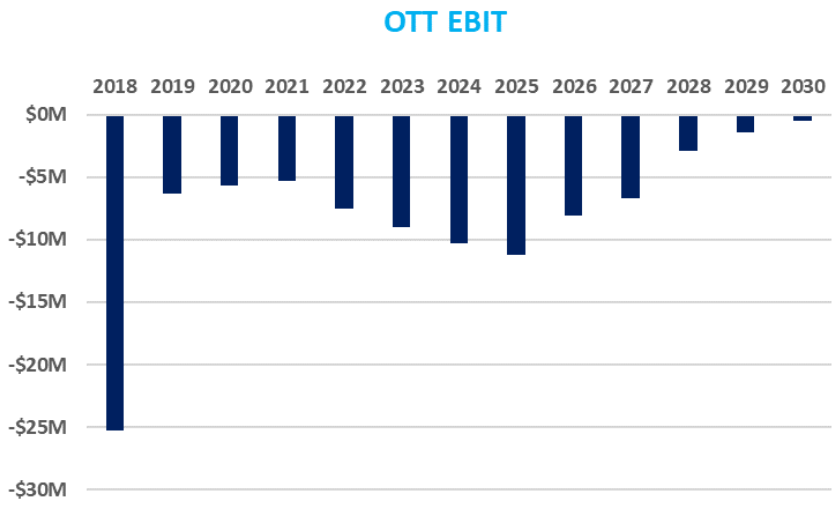
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Value destruction through Unprofitable Initiatives**:**

F1's OTT even threatens its core TV Revenue

NBC withdrew $40M after 17 years of F1 coverage:

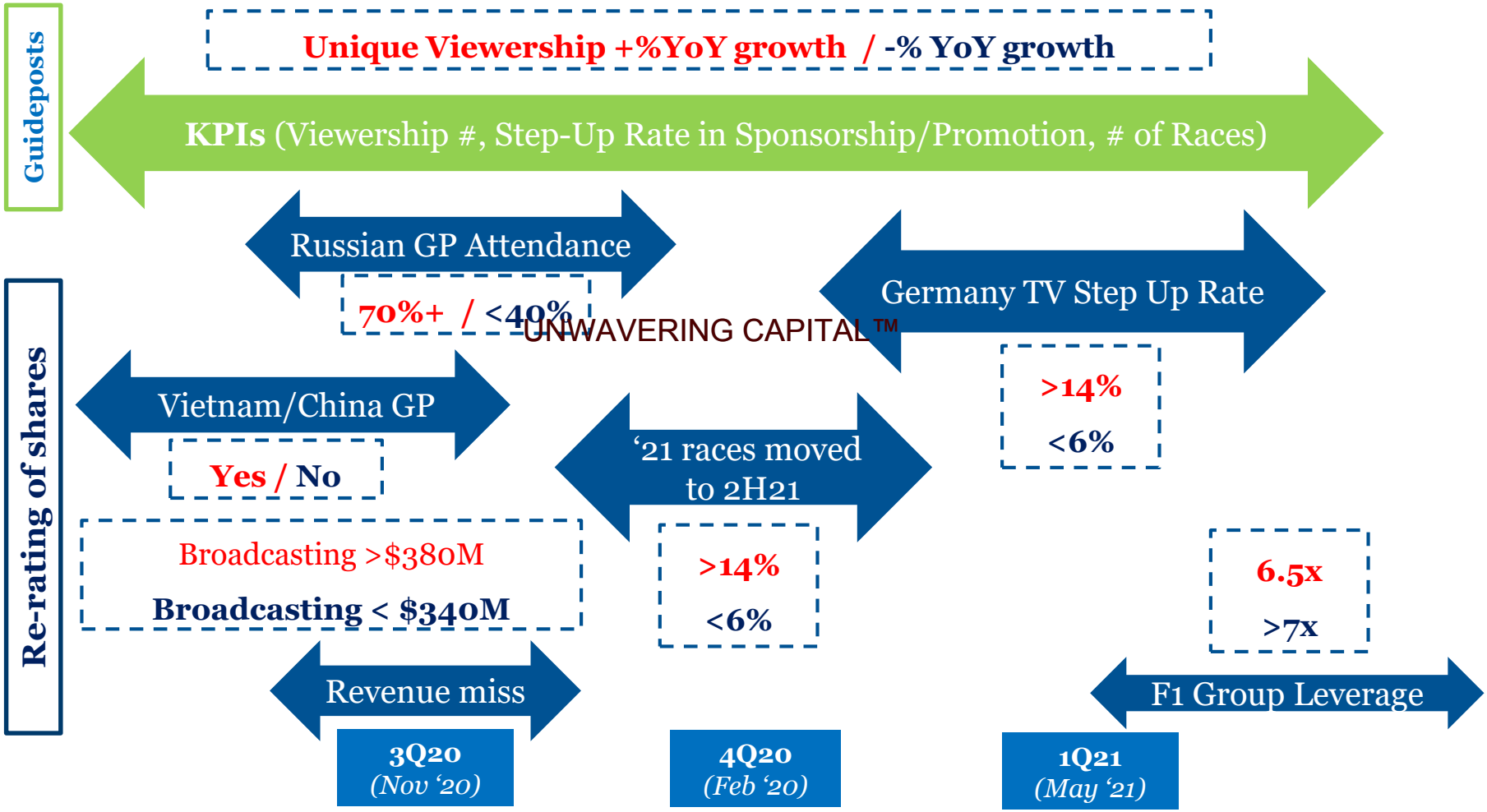
"unwilling to compete with the rights holder"



Investment Duration: 3 ~9 Months

Catalyst Path that will move the market towards my view

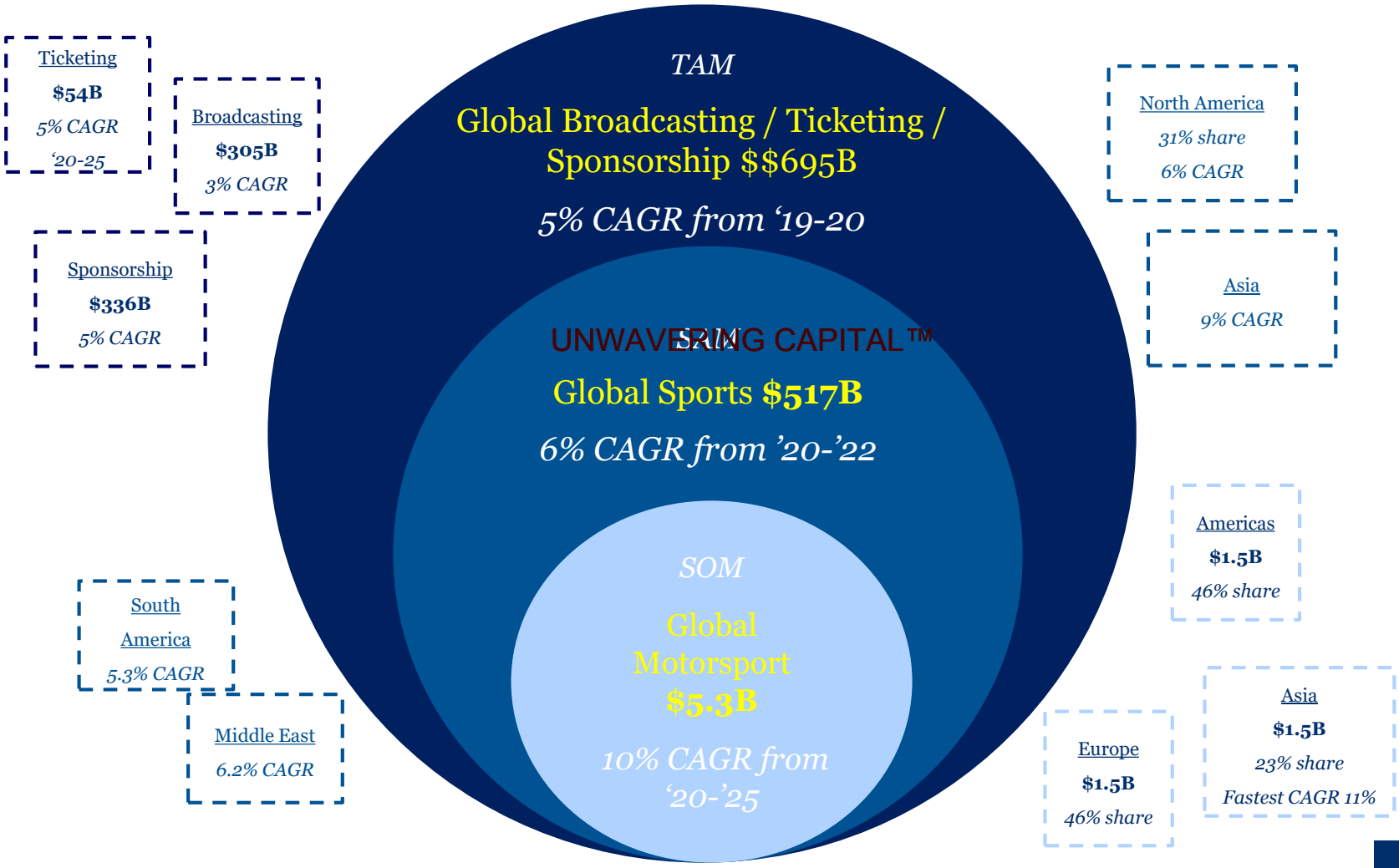
Goalposts *to validate or disprove my thesis*



Note: Red is what would cause me to cover my short. **Dark Blue** is what adds conviction and possibly size up the short.

How much is the is the Industry's Prize Money?

While F1 is small compared to other leagues, it already captures 33% Mkt Share of Motorsports SOM: *Limited Upside*

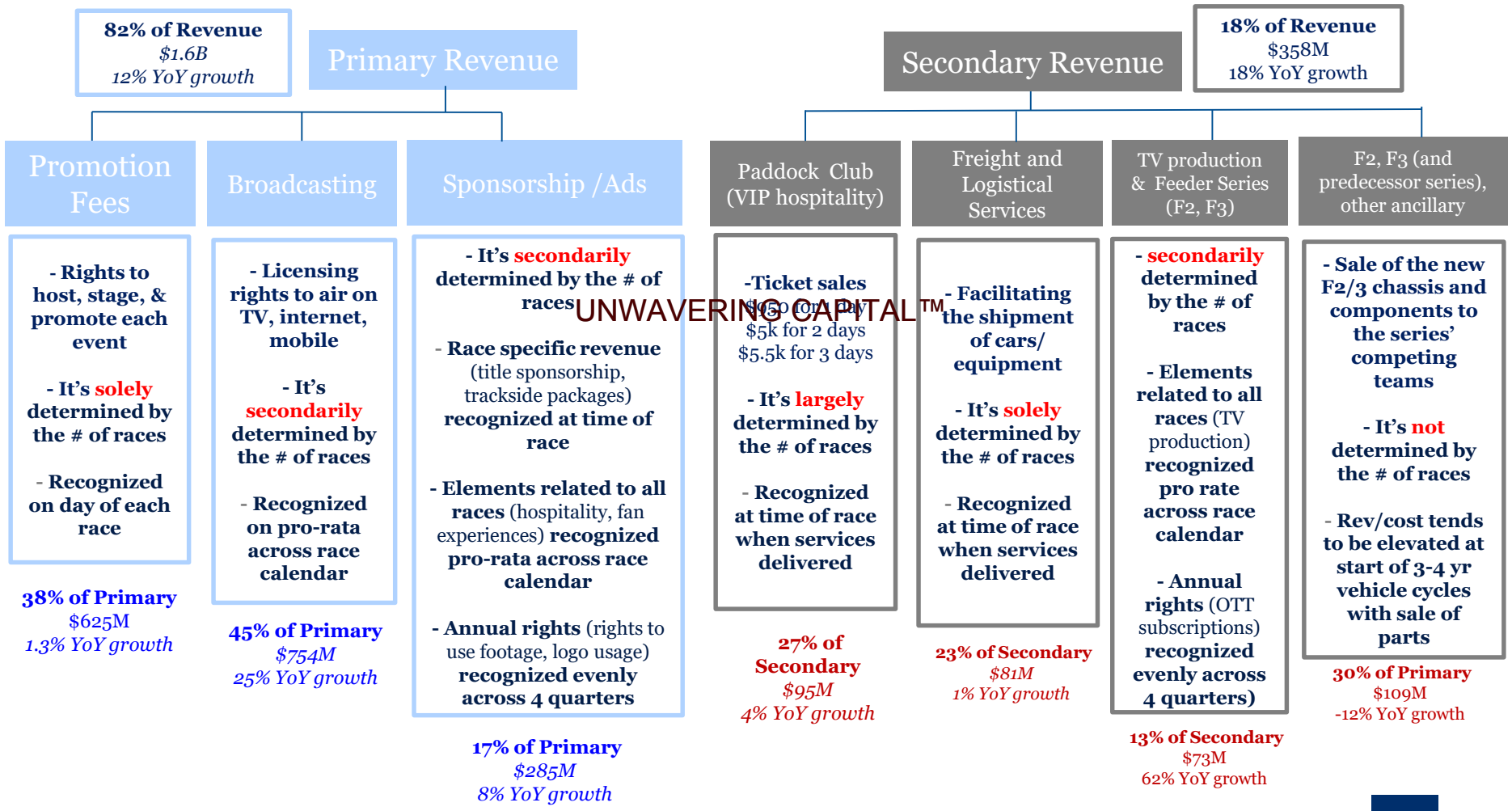


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Source: https://www.marketingcharts.com/cross-media-and-traditional/sponsorships-traditional-and-cross-channel-82185

Fan Captivity is the Engine that Drives the Sport's Flywheel

Meanwhile, the # of Races (the amount of content) fuels F1's Revenue Streams

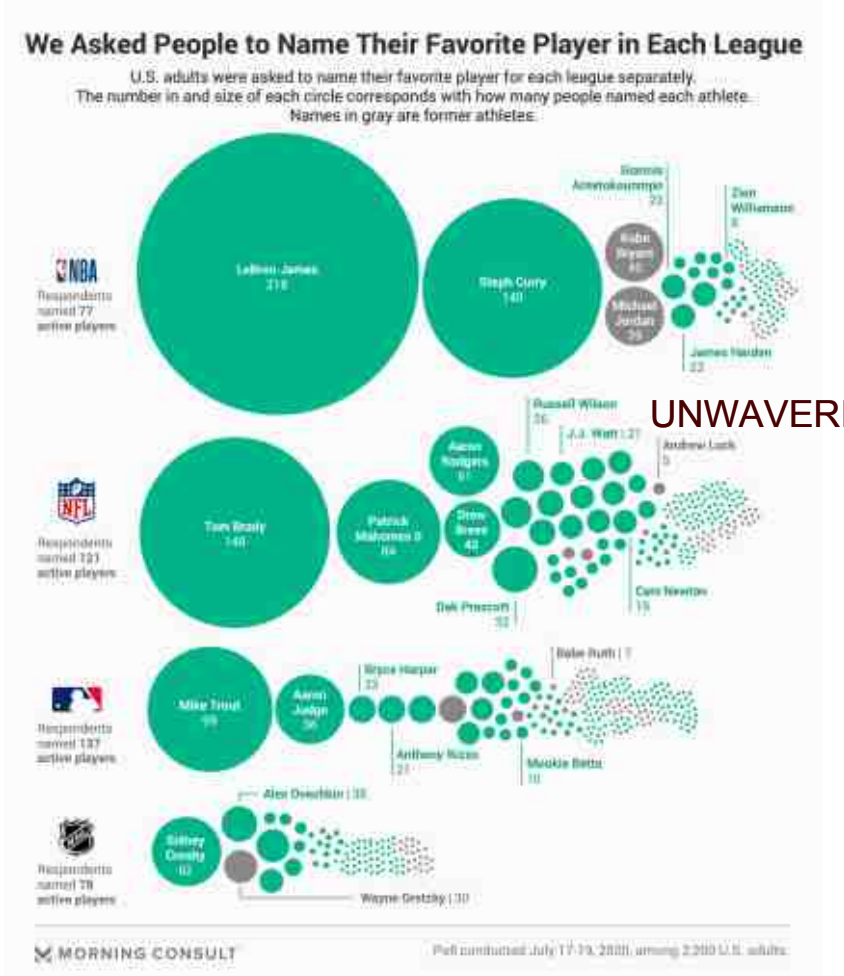


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Source: Company Filings (10K), Investor Presentation
Note: % of revenue figures are as of '19. (1) The secondary revenue breakdown isn't publicly disclosed. These are estimates by Evercore ISI

1 Dominant Players Gear up the Sport's Popularity

C.A will dethrone F1's key revenue driver, Lewis Hamilton, from the podium



Michael Schumacher, a legendary F1 driver, **brought in new fan base, and higher broadcasting/sponsorship deals**

Of Respondents' Favorite Athletes, James and Curry Most Followed on Social Media

ATHLETE	LEAGUE	MORNING CONSULT SURVEY RANKING (IN LEAGUE)	NO. OF SOCIAL POSTS IN THE PAST 12 MONTHS	TOTAL SOCIAL MEDIA FOLLOWERS
LeBron James	NBA	No. 1	760	139,305,722
Stephen Curry	NBA	No. 2	381	55,071,191
Tom Brady	NFL	No. 1	302	13,390,633
Giannis Antetokounmpo	NBA	No. 3	252	10,491,382
Aaron Rodgers	NFL	No. 3	66	6,957,894
Patrick Mahomes	NFL	No. 2	638	5,143,556
Mike Trout	MLB	No. 1	159	4,899,798
Alex Ovechkin	NHL	No. 2	24	4,240,521
Bryce Harper*	MLB	No. 3	206	3,233,643
Aaron Judge	MLB	No. 2	19	1,602,203
Patrick Kane	NHL	No. 3	31	775,385
Sidney Crosby**	NHL	No. 1	0	0

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A major reason for NASCAR's popularity crash is attributed to ***the demise of superstars***

Source: https://morningconsult.com/2020/08/12/mlb-nba-nfl-nhl-fan-favorites-polling/

❷ F1 is racing the same track that led NASCAR to crash

Mental Model: Facilitate Pattern Recognition to assess how C.A. will likely to play out



Car redesign **subdued fan fervor**

+

Constant rule changes, straying from the brand and history, **turned off fans**

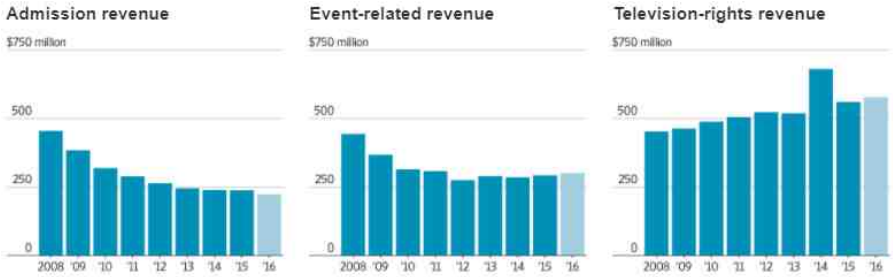
+

Teams **only receive 25 of NASCAR's revenue**

=

Nascar's Long Slump

Combined revenue at International Speedway, Speedway Motorsports and Dover Motorsports, which own 22 racetracks in the U.S.





New design, "to save cost", **discourages innovation**

+

Complicated new restrictions include slowing down the cars

+

will **chase fans** who watch F1 to see the latest tech and fastest car, **straying from the brand**

+

Teams only receive 10% of F1's revenue

=

?

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The Fall of Cultural Icon & Fall in Revenue

Source: https://www.formula1.com/en/latest/article.2021-f1-rules-the-key-changes-explained.2dCtCkxNofk20K1B4rJwTk.html#:~:text=2021%20F1%20cars%20will%20have,tyres%20with%2018%2Dinch%20rims.
https://en.wikipedia.org/wiki/List_of_defunct_NASCAR_teams

Thesis 1: Concorde Agreement's likely failure will cost the investors

1 History teaches us to Question Even What Looks Obvious (Case Study)

*F1 channeling more value from the teams to itself is actually **bad** to shareholders*

Nintendo used its dominance (~90% mkt share in the 70s) to extract value from its suppliers & customers

- Limited the # of games the suppliers could produce & Forced Retail to pay for shipments upon receipt

- Nintendo's high margin and the frustrated producers/buyers invited more competition and anti-trust regulatory measures. Eventually, it **lost its dominance**

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F1 Partners, who had to pay huge premiums to access its fan base, are **now switching lanes** to partner with Emerging Motorsports like Formula E and MotoGP

F1 will either **lose contracts** or **accept lower fees** and **share more risk** with its partners

Early signs of Pricing War Initiated by F1's Competitors

Hosts are choosing to host MotoGP over F1 and F1's Sponsors are Fleeing to Formula E

Host Fees

FIA only allows up to 25 Races

Fans demand more races in Europe, which **pay lower promotion fees**

Circuit owners are hosting other motorsports that are more profitable



Ads / Teams

Sponsorship market is in price war

Sponsors want to align themselves with future of mobility (it's cheaper too)

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Broadcasting

Few key markets left to turbocharge revenue by selling rights to pay-TV (vs. free to air)

F1 also plans to not have more Pay-TV as it loses viewers from the conversion

F1 is already shown in ~200 territories by 110 broadcasters

Broadcast Renewal Schedule for Key F1 TV Markets

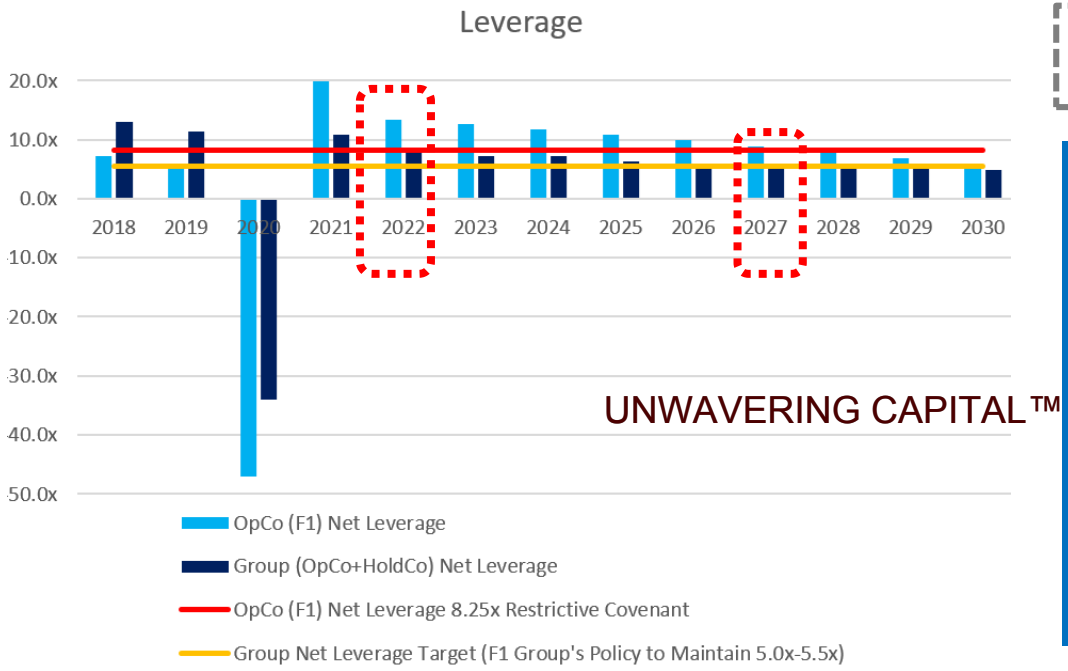
Market	Rights	Partner	Announced	Start	Expire
France	Free to Air	Canal+	1/21/2020	2018	2022
China	Free to Air	CCTV	3/21/2018	2018	2020
USA	Pay-TV	ESPN	10/4/2017	2020	2022
Germany	Pay-TV	RTL	12/19/2017	2018	2020
Australia	Pay-TV	STAR Sports	9/29/2017	2017	2022
Italy	Pay-TV	Sky Italia	1/25/2018	2018	2020
Germany	Pay-TV	Sky Deutschland	2/20/2019	2019	2021
Nordics	Pay-TV	NENT Group	6/13/2018	2019	2021
Finland	Pay-TV	MTV	10/14/2015	2019	2021
Pan Asia	Pay-TV	STAR Sports	6/10/2014	2016	2022
UK/Ireland	Pay-TV	Sky Sports	3/24/2016	2019	2024

Source: https://www.forbes.com/sites/bradadgate/2018/01/16/the-sports-bubble-is-not-bursting/#60e91f7c3bba
https://adage.com/article/media/pwc-report-sports-m/311578
https://www.forbes.com/sites/csylt/2019/09/04/revealed-the-five-f1-tv-contracts-expiring-next-year/#419e8884589a

Risk: Liberty thinks of their stocks as currencies and won't let the stock get below a certain #

1 Risk Mitigant: Low Chance of deals due to Restrictive Covenant

With 11.5x Net Leverage, F1 (OpCo) needs to deleverage (8.25x by March '22)



F1 Group = OpCo (F1) + HoldCo (Liberty)

Very Unlikely that Liberty will do another Reattribution Deal

F1 was already bailed out in April '20 with LYV attribution deal.

Also, Liberty is fully occupied with the GLIB & LBRD Merger

In fact, there's a high chance that **F1 will breach the Covenant in April '22:**

F1's net leverage won't be below 8.25x until '27. However, I didn't incorporate this significant Option Value to capture Buyback/M&A tail-risk given it's Liberty/John Malone.

So this should address investors' concerns around shorting Liberty stocks

Source: Liberty Debt Convenants.

Risk: Liberty thinks of their stocks as currencies and won't let the stock get below a certain #

❷ **Risk Mitigant:** High Chance of F1 Group Credit Rating Downgrade

F1 Group's Policy is to have its Net Leverage be in the range of 5x – 5.5x (it's currently 10.2x until 2026)

To avoid credit rating downgrade from the current B2 rating, a highly speculative level

F1 Group's Leverage can't remain sustainably above 7x (it won't achieve that level until 2Q21)

Also, F1 Group's FCF/Debt can't sustainably be in the range of low single digit (it's -7% now).

But it will remain that level for the next 10 years, so there's even a chance of credit rating downgrade.

Again, this is **another irresistible reason why FWONK is an exciting short opportunity.**

	6/30/2020	Interest rate
Cash and cash equivalents	$1,767	
LIBOR	–	7.45%
HoldCo (Liberty Media) Attributed debt		
1.375% cash convertible notes due 2023	–	L+ 1.375%
1% cash convertible notes due 2023	450	L+ 1.000%
2.25% AT&T exchangeable senior debentures due 2046	206	L+ 2.250%
2.25% LYV exchangeable senior debentures due 2048	–	L+ 2.250%
Total HoldCo (Liberty Media) Attributed debt	656	
OpCo (F1 Subsidiary) Debt		
Bank (Term Loan/RCF); Delta Topco Senior Loan Facility	2,902	L+ 3.951%
Less: deferred financing costs (FMV adj. and deferred loan costs)	77	
OpCo (F1 Subsidiary) Attributed debt	2,979	
OpCo Net Debt	2,578	
OpCo Net Leverage (Net Debt/Adj. OIBDA) - Covenant	11.5x	
Total Attributed Formula One Group Debt	$3,635	1.03%
F1 Group Net Debt	1,978	
F1 Group Net Leverage (Net Debt/Adj. OIBDA)	10.2x	
Maturity schedule		
2020 (remainder of the year)	–	
2021	–	
2022	–	
2023	450	
Thereafter	3,185	
Total	$3,635	

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Source: Liberty Debt Convenants.

Risk: Liberty thinks of their stocks as currencies and won't let the stock get below a certain #

3 Low Chance of Deals: Strategic and Regulatory Reasons

Regulators don't allow 2 popular EU Motorsports to be held by One Owner

Consensus

1. F1 will acquire MotoGP: Bridgepoint, explored a sale of the asset in 4Q18 but it hasn't sold yet. Also it's an asset that will most likely create synergies with F1.

2. Merger with Formula E: LBTYA and DISCA owns 24% and 14% of Formula E respectively.

My Divergent Views

1-1) **Bridgepoint won't sell:** The PE firm believes in the asset's LT growth; it asked for bids to set a price for sale of the asset from a fund it raised to its new fund

1-2) **Won't be approved by regulators:** CVC was forced to sell MotoGP when it acquired F1

2) Different Businesses: They have disparate value propositions and brands

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Source: Liberty Debt Convenants.

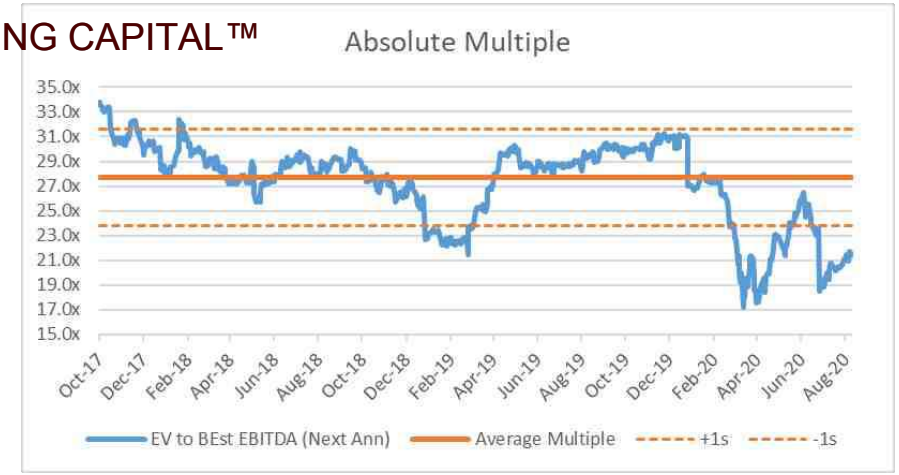
Comps Analysis:

Mkt Cap	Symbol	Stock Price	Residual		Absolute		Valuation ('21E) - St Consensus			Other Factors					Shareholders	
			1W	YTD	1W	YTD	EBITDAx	FCFx	PEx	3 yr Rev CAGR	Net Debt /EBITDA	SI	ADTV	Crowding	HF	MF
$4.6bn	Live Events / Sponsorship	--	2.9%	-18.7%	5.6%	-27.9%	19.2x	220.8x	24.8x	9.4%	10.3x	7.6%	$61m	0.14	-0.04	0.25
$8.7bn	FWONK-USAA	$37.98	2.2%	-6.4%	4.3%	-17.4%	21.7x	22.3x	n/a	4.0%	12.1x	4.55%	$57m	2.08	1.93	1.15
$11.2bn	LYV-USAA	$51.69	4.7%	-44.3%	8.2%	-27.7%	24.9x	220.8x	n/a	11.5%	28.1x	9.62%	$197m	(0.64)	(0.94)	0.74
$3.5bn	WWE-USAA	$45.41	2.6%	-4.6%	2.5%	-30.0%	12.0x	n/a	24.8x	9.7%	1.0x	16.30%	$38m	1.00	1.66	2.23
$2.5bn	MANU-USAA	$15.06	-2.1%	5.7%	2.5%	-24.4%	20.6x	--	n/a	6.9%	2.7x	2.17%	$3m	0.08	(0.21)	(0.36)
$1.1bn	BATRK-USAA	$20.81	6.3%	-31.5%	9.1%	-29.6%	38.4x	n/a	n/a	23.2%	9.6x	2.21%	$5m	0.13	(0.68)	(1.61)

FWONK doesn't deserve 2x turns premium* against *other 'trophy assets' that also have LT contracted revenue*. It also has:

- **high leverage** (13.5x net debt/EBITDA vs. 4x peers)
- **slowest growth rate** (3-yr revenue CAGR is 4% vs. 9.4% peers) with **slower revenue growth trajectory**
- **no voting power** (5% discount?)
- **tracking stock** (10%+ discount?)
- **Limited scarcity value:** Public investors can also buy an entire sport/league, WWE

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*** Note**: when I first started the pitch, it was 9x turns premium)*

10 Year DCF: 7% WACC & 0.1% Terminal Growth Rate

F1's Low CapEx & High FCF Conversion don't Outweigh Value Destruction

DCF ANALSIS

	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	Terminal
EBIT (excl. amort. of rights FIA)	(5)	(413)	(134)	(21)	(7)	(13)	(20)	(27)	(34)	(42)	(50)	(59)	(59)
Less: Taxes	1	70	23	4	1	2	3	5	6	7	9	10	10
Add: D&A	453	441	453	517	517	538	561	586	613	642	674	709	709
Less: Capex	(44)	(17)	(11)	(11)	(11)	(12)	(12)	(13)	(13)	(14)	(15)	(16)	(16)
Less: Working Capital	58	(9)	(96)	(96)	(96)	(96)	(96)	(96)	(96)	(96)	(96)	(96)	0
Equals: UFCF	**462**	**73**	**235**	**393**	**404**	**420**	**437**	**455**	**476**	**498**	**522**	**548**	**645**
Cost of Capital	7.08%	7.08%	7.08%	7.08%	7.08%	7.08%	7.08%	7.08%	7.08%	7.08%	7.08%	7.08%	
Cumulated Cost of Capital	1.00	1.07	1.15	1.23	1.31	1.41	1.51	1.61	1.73	1.85	1.98	2.12	
Present Value: UFCF	462	68	205	320	307	298	290	282	275	269	263	258	
Present Value: Terminal Value	4,346	4,654	4,984	5,337	5,715	6,120	6,554	7,018	7,515	8,047	8,618	9,228	
NPV of Remaining Annual FCF	2,836	2,964	2,939	2,754	2,544	2,305	2,031	1,720	1,366	965	512	0	*14.3x*
Total Firm Value	**7,182**	**7,619**	**7,923**	**8,091**	**8,260**	**8,425**	**8,585**	**8,738**	**8,881**	**9,013**	**9,130**	**9,228**	
Multiple of Trailing EBITDA	*14.9x*	*--*	*16.1x*	*12.9x*	*12.9x*	*12.9x*	*12.9x*	*12.8x*	*12.7x*	*12.5x*	*12.3x*	*12.0x*	
Multiple of Fwd EBITDA	*--*	*15.5x*	*12.6x*	*12.7x*	*12.7x*	*12.6x*	*12.6x*	*12.5x*	*12.3x*	*12.1x*	*11.9x*	*14.2x*	
YE Net Debt	5,090	2,530	3,573	3,379	3,169	3,102	2,786	2,611	2,448	2,300	2,298	2,052	
Value of Equity	**2,092**	**5,088**	**4,350**	**4,712**	**5,090**	**5,323**	**5,799**	**6,127**	**6,433**	**6,713**	**6,832**	**7,176**	
FDS	232	237	237	237	237	237	237	237	237	237	237	237	
DCF PT	**9.03**	**21.47**	**18.35**	**19.88**	**21.48**	**22.46**	**24.47**	**25.85**	**27.14**	**28.33**	**28.83**	**30.28**	
% Upside / (Downside)		**(42%)**	**(51%)**	**(47%)**	**(42%)**	**(40%)**	**(34%)**	**(30%)**	**(27%)**	**(24%)**	**(22%)**	**(19%)**	

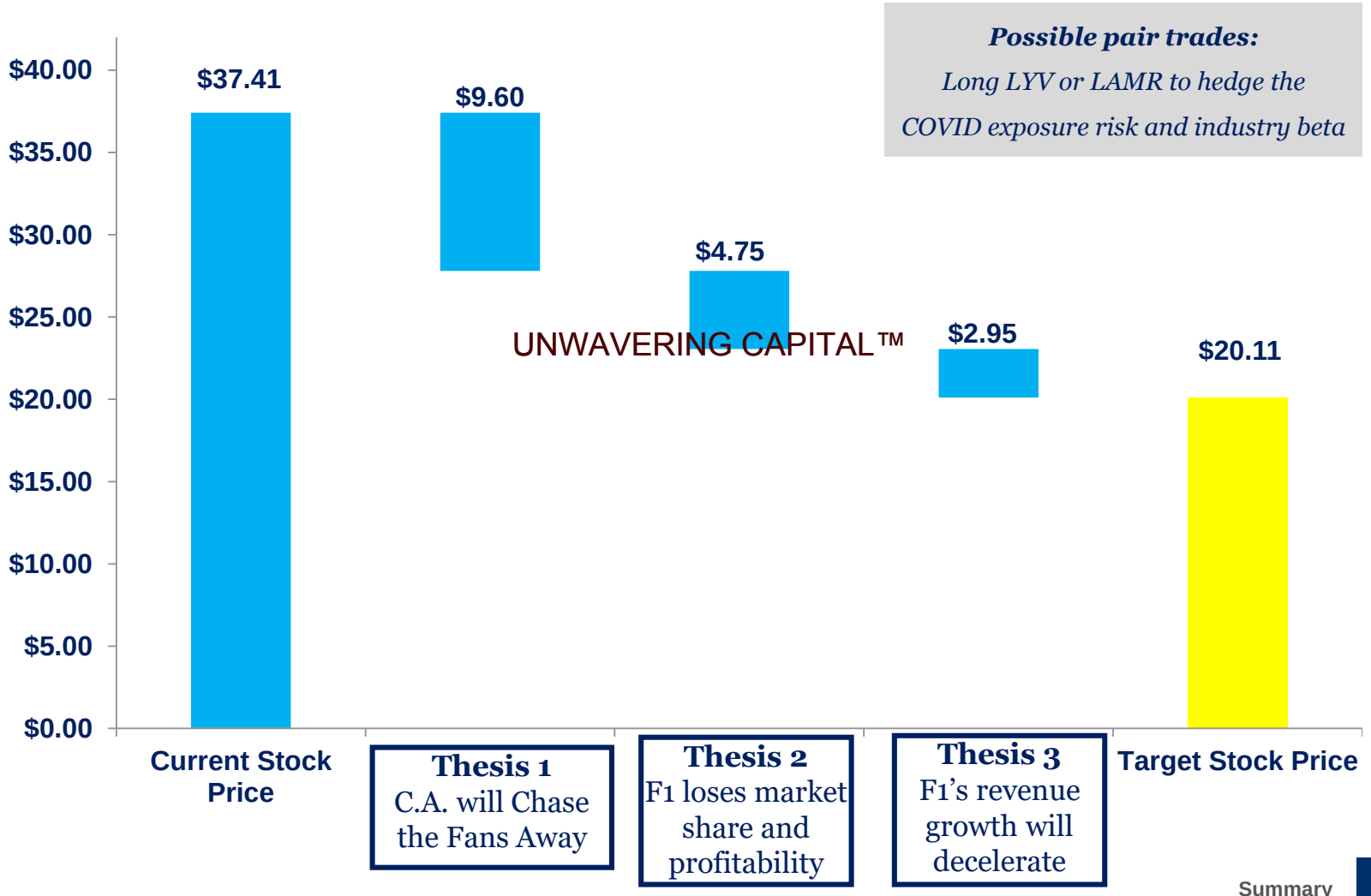
Assumptions	
Cost of Debt	5.00%
Risk Free Rate	0.66%
Market Risk Premium	8.00%
Beta	1.17
Cost of Equity	10.0%
Terminal Growth Rate	0.1%
Debt / Total Capital	50.0%
ETR	17.0%
WACC	**7.08%**

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Return on Capital												
NOPAT	**(5)**	**(343)**	**(111)**	**(17)**	**(6)**	**(11)**	**(17)**	**(22)**	**(28)**	**(35)**	**(42)**	**(49)**
Equity	*5,241*	*5,241*	*5,241*	*5,241*	*5,241*	*5,241*	*5,241*	*5,241*	*5,241*	*5,241*	*5,241*	*5,241*
Debt	*6,264*	*3,638*	*3,638*	*3,638*	*3,638*	*3,768*	*3,638*	*3,638*	*3,638*	*3,638*	*3,768*	*3,638*
Invested Capital	**11,505**	**8,879**	**8,879**	**8,879**	**8,879**	**9,009**	**8,879**	**8,879**	**8,879**	**8,879**	**9,009**	**8,879**
ROIC	**0.0%**	**-3.9%**	**-1.3%**	**-0.2%**	**-0.1%**	**-0.1%**	**-0.2%**	**-0.3%**	**-0.3%**	**-0.4%**	**-0.5%**	**-0.6%**

Summary: Put the Brakes and Stop Following the Crowd

F1's Winning Formula are No Longer Working. Time to get the Wheels Turning



Possible pair trades:

Long LYV or LAMR to hedge the COVID exposure risk and industry beta

"Have the arrogance to act, act decisively, and the humility to know you could be wrong"
– Seth Klarman

Summary: Let's win the Alpha Race

Probability	30%	50%	20%
	Bear	Base	Bull
# of Races in '21	20	21	22
21E Promotion Fee	$581M	$622M	$672M
vs. Consensus	*-10.9%*	*-4.5%*	*3.0%*
Escalator/Renewal Rate ('22-'30)	*-3.0%*	*1.0%*	*3.0%*
YoY % growth ('19 to'21)	*-4.0%*	*2.9%*	*11.0%*
Promtion Fee / Race	$29M	$45M	$31M
21E Broadcasting Revenue	$792M	$822M	$867M
vs. Consensus	*-4.8%*	*-1.2%*	*4.3%*
Escalator/Renewal Rate ('22-'30)	*3.0%*	*7.5%*	*13.0%*
YoY % growth ('19 to'21)	*5.0%*	*9.0%*	*15.0%*
Broadcasting Rev. / Race	$40M	$39M	$39M
21E Sponsorship Revenue	$302M	$313M	$317M
vs. Consensus	*-13.5%*	*-10.5%*	*-9.2%*
Escalator/Renewal Rate ('22-'30)	*-3.0%*	*1.5%*	*3.0%*
YoY % growth ('19 to'21)	*-1.0%*	*2.5%*	*4.0%*
Sponsorship / Race	$15M	$15M	$14M
21E Secondary Revenue	$322M	$337M	$354M
vs. Consensus	*-7.7%*	*-3.6%*	*1.5%*
Escalator/Renewal Rate ('22-'30)	*-4.0%*	*-2.0%*	*4.0%*
YoY % growth ('19 to'21)	*-10.0%*	*-6.0%*	*-1.0%*
Secondary Revenue /Race	$16M	$16M	$16M
21E Total Revenue	$2,013M	$2,106M	$2,226M
vs. Consensus	*-6.4%*	*-2.0%*	*3.6%*
Total Revenue / race	$101M	$100M	$101M
21E OIBDA	$101M	$178M	$267M
vs. Consensus	*-80.6%*	*-65.7%*	*-48.4%*
OIBDA Margin	*5.0%*	*8.4%*	*12.0%*
21E Adj. EBITDA	$382M	$492M	$557M
vs. Consensus	*-22.0%*	*0.4%*	*13.5%*
EBITDA Margin	*19.0%*	*23.4%*	*25.0%*
Forward EBITDAx	14x	20x	20x
Ent Value *(in US$M)*	$5,354	$9,846	$11,132
Market Value *(in US$M)*	$1,781	$6,273	$7,559
Target Price	$7.52	$26.47	$31.89
Upside/Downside	*-79.8%*	*-28.8%*	*-14.2%*
Weighted Avg. TP		$21.87	
Upside/Downside		*-41.2%*	
Risk/Reward Ratio		3.2x	

Where can I be Wrong?

Alpha Erosion *(when I first found the opportunity, FWONK was trading at 9x turns premium in EBITDAx; now 2x turns)*

Confirmation/Recency Bias

Overconfidence

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What have I done to mitigate my bias?

1. ***Intellectual Flexibility*** *– Revisited the issues that that I overlooked (from ST21's questions) and changed my views*
2. ***Honesty*** *– Micah's push back on certain topics made me rethink more deeply and adjusted mine if I found any bias/logical flaws in my thought process*

Appendix

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Additional Supporting Evidence that will help strengthen your conviction

In-Depth Interviews with 9 Experts

1. **F1:** ex-CEO, Chase Carey & ex-Head of Media Rights Sale, David Gillett
2. **Liberty Media:** Chief Portfolio Offer & Head of IR SVP, Courtnee Chun
3. **Mercedes:** ex-Business Dev at Mercedes F1 Team& Current CFO @ Racing Point Force India F1 Team
4. **Rights Formula:** CEO of F1 marketing Agency, Robin Fenwick

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5. **Univision:** ex-EVP of Enterprise Development, Rick Alessandri on Spanish Media *(F1's Key Market: Brazil)*
6. **Amplifi:** President, Michael Law on Linear TV and CTV Ad Spend
7. **Morgan Stanley:** Head of US Media Research, Ben Swinburne
8. **Evercore ISI:** Analysts – Vijay, Bradford, and John
9. **Forensic Research:** Lead, Andrew Hayes on F1's Earnings Quality

No Industry standardized KPI measurements

F1 confused its investors and sponsors by inconsistent TV viewership #s, the key driver of Broadcasting & Ad

"F1 TV Audience Reverses by 40M under New Measurement System": *(Forbes – Jan 6,2018)* (1)

SEC Filing - May 16, 2017 (2)

in 2016, Formula 1 had a cumulative live television audience of approximately 390 million unique global viewers

A. Tellingly, FOM alleges that these both describe the total audience as "global" viewers whereas the company release in 2018 doesn't use the same term.

Global Media Report- May 2017 (4)

~390mm unique, deeply passionate and loyal [illegible] "appointment" television

≠

Company press release – Jan 5, 2018 (3)

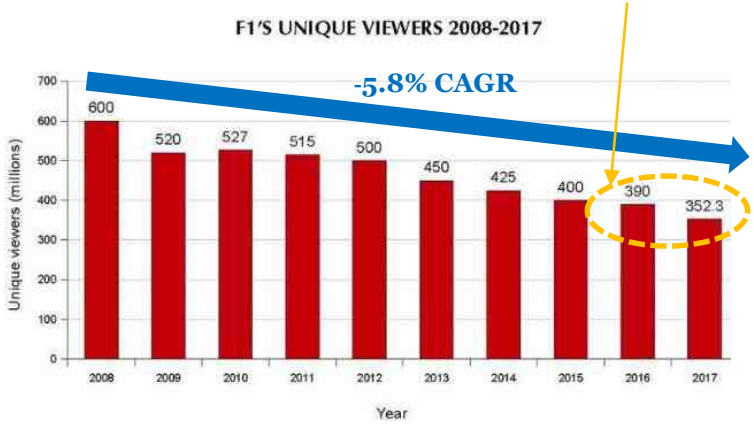
During 2017, 352.3 million unique viewers tuned their TV set into F1 progr
first time since 2010 that there was not a decrease in this specific number.

C. In contrast, data from 63 markets was used to derive the 2017 figure. If this new measurement system was applied retrospectively to 2016, it would get a similar total. This is why the press releases release states that "there *wasn't a decrease".*

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B. In addition, the 2016 figure was calculated using data from just 10 markets which was then extrapolated to give a total for the 200 territories worldwide.

Turns out '16 was the biggest fall since the audience U-turned from 500M in '12 to 450M the following year



D. So in the blink of an eye, F1 wiped 40M viewers off its audience after sponsors signed up in 2017 on the strength of the "390M audience" figure *(both the sponsorship and broadcasting rates are proportionate to the TV viewership figure).*

Although FOM did release the 'actual' figure and the market digested the news, the **bigger question is can you trust FOM?**

Source:
(1) https://www.forbes.com/sites/csylt/2018/01/06/f1-tv-audience-reverses-by-40-million-under-revised-measurement-system/#499f3b413a52
(2) https://ir.libertymedia.com/static-files/63af23ca-a47c-4ab4-849e-89cf0a22184f
(3) https://www.formula1.com/en/latest/article.strong-growth-for-f1s-tv-and-digital-audiences-in-2017.6Cted4V292gQ420AeoSO2e.html (4) https://ir.libertymedia.com/static-files/42c6ab1c-d887-4378-ae06-ab05d8b9e83c

1) Numerous Smoke Signals?

FOM made another U-Turn – this time, on its much-trumpeted attendance data



1

(1)

- FOM's claim on its press release, 'F1 attendance saw an 8% increase on 2016' contradicts with race organizers' figure – local promoters' YoY growth is up to 4x lower than the number released by F1.
- For example, while Baku City Circuit said there was a 30% yoy increase in ticket sales, F1's updated release boasted that the attendance increased by 138%.
- Not one [Reuters, NBC, Fox Sports and Reuters] noticed that F1's 2016 attendance figures were riddled with basic errors. They just faithfully published the data, quoting Sean Bratches, an ex-ESPN executive who was supposed to help F1 accelerate its drive engine.

(2)

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2

BBC
December 19, 2017

- There was a **systematic error** in the % calculation.
- We have sent an updated version of the press release.
- It isn't unclear if the updated release was distributed more widely as it hasn't been reported by other media outlets.

- While FOM admits that it was a "systematic error", it's really a case of poor arithmetic. I mean Liberty Media and FOM repeatedly executes complicated deals like FWON acquisition, pulling off shrewd tax scheme (paying only 2% tax rate), that makes private equity and tax lawyers look bad, why can't FOM compute a simple arithmetic?
- To be fair, F1 also made mistakes that resulted its figure look bad. For instance, FOM said that the attendance at its Austrian Grand Prix jumped by 41% from 85k in 2016 to 145k in 2017 when in fact, it was actually a 71% increase. Likewise, F1 remarked that the Italian Grand Prix attracted 20% more spectators in 2017 as its attendance rose from 147.5k to 185k, when actually, there was an increase of 25.4%.

Source
(1) https://www.pitpass.com/60892/F1-revises-attendance-data-following-systematic-error
(2) https://www.formula1.com/en/latest/article.f1-attendance-figures-hit-four-million-in-2017.A1haq5GkLe6SKsyya22Ia.htm
(3) https://www.bbc.com/azeri/azerbaijan-42411664l

1) History of Questionable Measurements

Decades-long 'track record' of Inflating its TV viewing figures to help sell sponsorship

"F1 admits misleading TV audience numbers": *(Marketing Week – March 11,2004)* [1]

Under the new methodology, the average viewing figures for 2002 and 2003 were 127M and 162M respectively, **a huge drop from the 291M reported** to be watching in 1999



Ben Pincus

CEO of agency 'The Works' who works with F1 sponsors

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- F1 is guilty of manipulating its TV viewership data to help its sponsorship business.
- "For years, the accepted average live race audience for each of the 17 races in a season was 300M, which could be up to 2x as many as actually watched the races. But hopefully this new system will restore credibility to the industry."
- Viewing figures for China for the 1999 Monaco Grand Prix were given as 229M, even though there was no live broadcast, which reflects FOM's old methodology of including viewers of news among those who watched races in full.

"You can't make a good deal with a bad person"

- Warren Buffet

Source
https://www.marketingweek.com/f1-admits-misleading-tv-audience-numbers/

Catalyst Path and Goalposts to win the Alpha Race

Timing F1's announcements are tough. But this roadmap can help avoid roadblocks

Guideposts

Re-rating of shares

Biden – "it's difficult to see the US having major league sports without a vaccine development" will Miami GP do delay its inaugural race again?

COVID updates and Announcements on School Reopening

Press leaks on the terms of other sports' renewed contracts

Cancellation of '20 races (esp. Vietnam)

Use other sports' broadcasting and sponsorship deals to gauge what the latest market landscape looks like and use those as benchmark to predict what the renewal rates and the terms will be. But identify the structural differences between F1 and that sport to adjust and make an apple-to-apple comparison

The lack of live sports has been a boon for F1. If many live sports are rescheduled faster than market had anticipated in late '20 - spring of '21, FWONK presents an **opportunity to monetize unsystematic risk** in the midst of many media stocks' recovery

Updates on other sports' schedules

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Changes in viewership #s with F1's growing focus on pay-TV

Russian GP

Attendance level can point to the direction where fans' sentiment/behavior is shifting towards. It can also be used to **reassess the% likelihood** of 21 races being moved to 2H20

If F1 TV's structurally weak value-proposition is revealed in the #s, some funds may adjust their models/expectations

OTT's losses continue. Growing questions on the terminal value creation story

Mgmt. reiterated that COVID won't have insignificant impact on the broadcasting/sponsorship revenue via rebates/renegotiations. But the misalignment on what's considered 'ok' could present an opportunity. Also if the mkt realizes how easy contracts can be renegotiated/breached, the bulls' argument that FWONK deserves 9x turns premium vs. peers weakens

Mercedes/Redbull continue their dominance

Concorde Agreement disappoints

Revenue miss

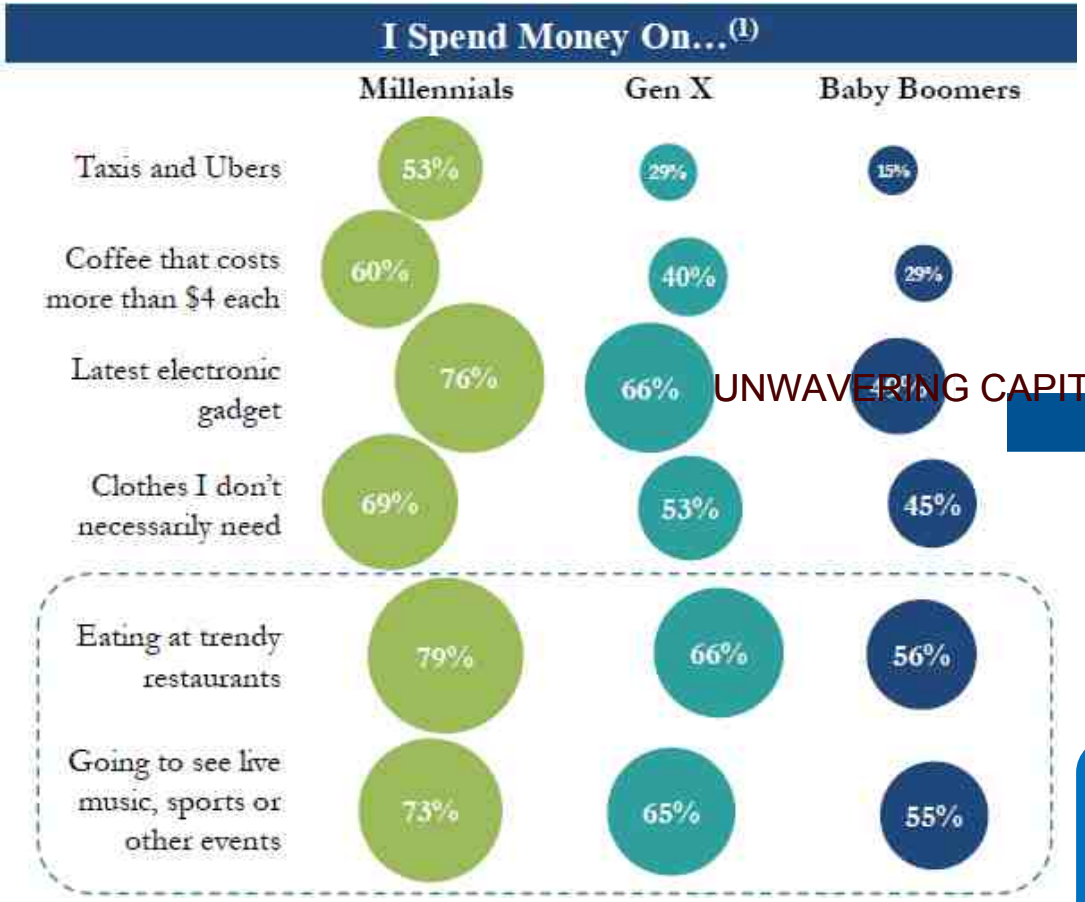
3Q20 *(Nov '20)*

4Q20 *(Feb '20)*

1Q21 *(May '21)*

Same Tailwind but different outcomes

U.S. Consumer Spending on live events grew 7% CAGR over the past 5 years



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LIVE NATION ENTERTAINMENT

(2)

Average per fan spending (parking, food, merchandise) at its amphitheaters **grew** by $2.50 to $29+ per head as it:

- Improved product offering
- Reduced friction with shorter lines
- Improved VIP hospitality offerings

(3)

Meanwhile F1's hospitality revenue has **fallen** by -2% in 2018 and recovered only by +4% in 2019

(4)

"Paddock Club **will shrink by 15% in 3-5 years** as people now don't want to be away from their families for 3 days to pay a $5k ticket"

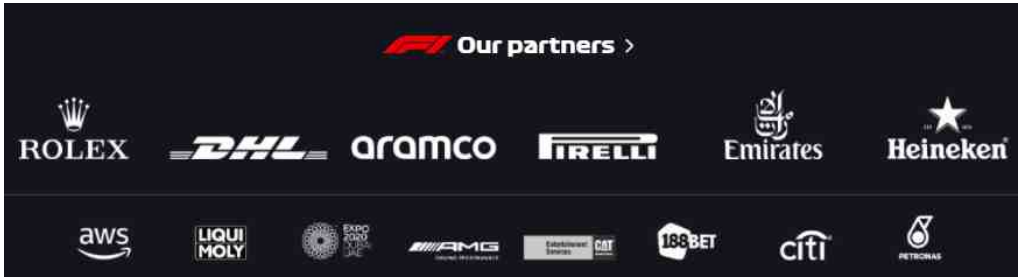
- CEO at Rights Formula, a sports marketing agency

(Call with Industry Expert)

(1) Source: Charles Swab Modern Wealth Index, June 2017 (Liberty Media 2017 Investor Presentation. **(2) Source:** LYV 4Q19 Earnings Release
(3) Source: Estimates by Evercore ISI. **(4) Note:** Paddock Club is the exclusive VIP package, where one enjoys the best views, multi-course meals and open Champagne bars. The other figures on consumer spending (i.e. hospitality) are not disclosed by the company nor estimated by the sell-side.

Sports Dominate Sponsorship but F1's Road Looks Bumpy

Weak ad market compounds F1's secular headwind in sponsors' preference to associate themselves with Formula E that has better ESG message



Championship Title

- Partner Exclusivity
- E.g. LG is the technical partner and it often provide access to content as well as other media properties
- Most expensive – is ROI justified?

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Global Sponsorship TAM: $336B *@5% CAGR*

Live Sports Sponsorship: $235B (70% of all Sponsorship)





Circuits
Aims to increase their notoriety, hoping that the reputation of the sport will rub off on them

Team
Great visibility on the car but the large # of other sponsors can make brand recognition difficult

Source: https://en.elevent.co/blogs/sponsorship/16644069-formula-1-sponsorship

How did F1 do in '08 Crisis?









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- **4 brands/teams**, with numerous winless seasons each (lower sponsorship revenue and lower prize money), **left F1**

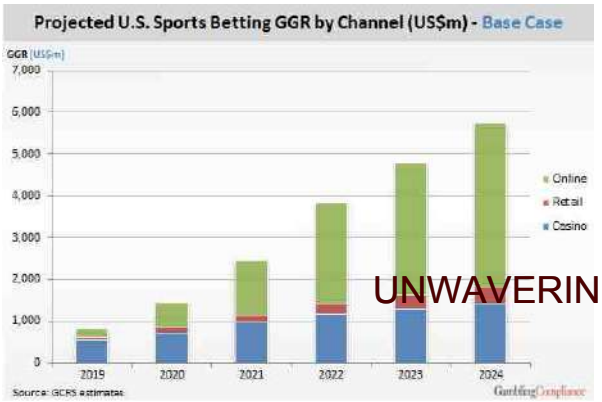
- They cited the economic crisis as their justification for **no longer spending ~$300M a year** they budgeted for F1

Source: https://en.elevent.co/blogs/sponsorship/16644069-formula-1-sponsorship

F1 can't benefit from the Tailwind in Sports Betting

Receiving sponsorship from or partnering with betting companies misaligns with its strategy

With F1's $100M contract with ISG for rights to gambling sponsorship, investors are pricing in the option value of F1 continuing to benefit from the secular trend





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Embrace. F1 used to lobby tobacco sposnorships anyway

1) Attract new 'fan' base and increase customer engagement

2) It's harder for regulators to enforce F1 because it's so international.

3) But Australia that hosts F1 races regularly and F1's 1 of the 4 key markets, Italy, ban gambling groups form endorsing or advertising

Reject. Unable to get the tailwind that Liberty needs

1) F1 refused to accept endorsements from betting groups for past 40 years, believing that it would **tarnish the sport's glamorous image**

2) **Misalignment with its strategy** of growing younger fans

3) By the nature of the business, its relationship with governments have to be good. Benefiting from will **tarnish the relationship**, esp. Middle East where all forms of gambling are illegal

Source: https://gamblingcompliance.com/premium-content/insights_analysis/us-sports-betting-market-hit-57bn-2024
https://www.espn.com/chalk/story/_/id/26740441/one-year-legal-us-sports-betting-learned

500M F1 Fans allows it to host 20 Races

Otherwise,

# of Grand Prix

- **Past few years, 19~21 races**
- **I projected it to grow to 22 races from '21 and 23 from '25** *(Courtnee Chun, Chief Portfolio Officer & SVP IR, whom Micah and I spoke to – "we're more focused on the quality of each race than the quantity"*

European Races

- **9 of 21 races were in Europe in '19** (Spain, Monaco, France, Austria, UK, Germany, Hungary, Belgium, Italy

Flyway Races

- **12 of 21 races were in non-Europe in '19** (Australia, China, Bahrain, Azerbajan, Canada, Singapore, Russia, Japan, US, Mexico, Brazil, Abu Dhabi

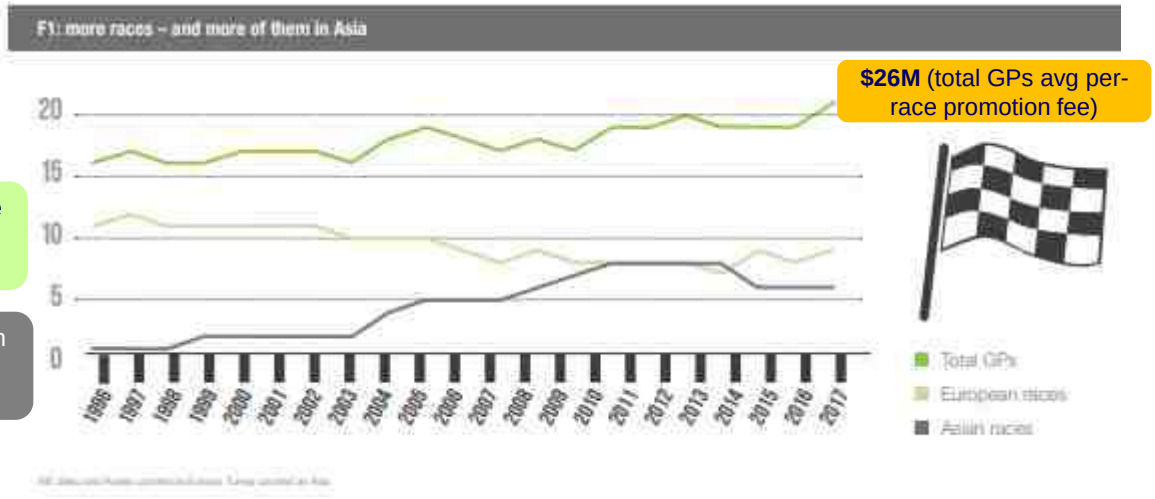
Primary Revenue

- **82% of Revenue**
- *$1.6B*
- *12% YoY growth*

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Secondary Revenue (1)

- **18% of Revenue**
- $358M
- 18% YoY growth



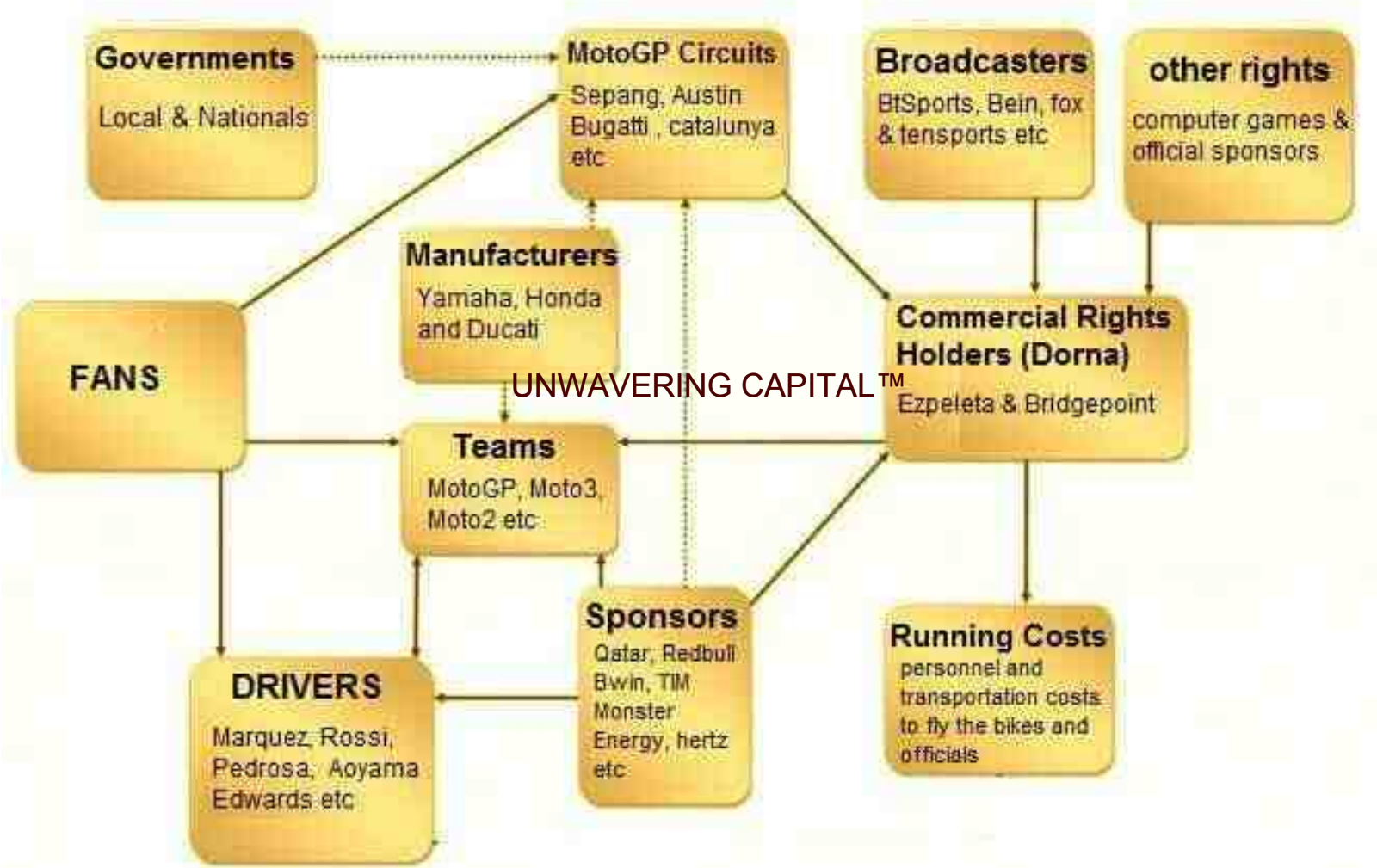
$23M (European race avg per-race promotion fee)

$37M (Flyaway/Asian race avg per-race promotion fee)

$26M (total GPs avg per-race promotion fee)

Source: Company Filings (10K), Investor Presentation
Note: % and $ revenue figures are all as of '19. (1) The secondary revenue breakdown isn't publicly disclosed. These are estimates by Evercore ISI.

Auto Sports Ecosystem



http://www.tsmplug.com/motogp/money-generation-flow-chart/

❸ Measures intended to achieve parity don't work

NBA

"Compromise is necessary to benefit the greater good"

"The luxury tax system will help smaller teams to not get pushed out of the race by wealthier teams to sign free agents.

NBA had the **least parity** out of the 4 major leagues.

Although it was the only one with both a salary cap and a luxury tax system it had the least amount of teams (11) win championship. NFL (15), MLB (20), NHL (20)

Why? Because the new measures didn't induce the smaller teams to spend more on their players.

F1

"Compromise is necessary to benefit the greater good"

The top 3 teams spend $400M+ a year while the remaining teams have budgets that are 3x smaller.

McLaren principal: "the big teams aren't just there because of having more money. They simply do a better job compared to us"

Market's wishful thinking:

C.A. will achieve greater parity for F1. Let's focus on another issues

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Thesis 1 – C.A. will Chase the Fans Away

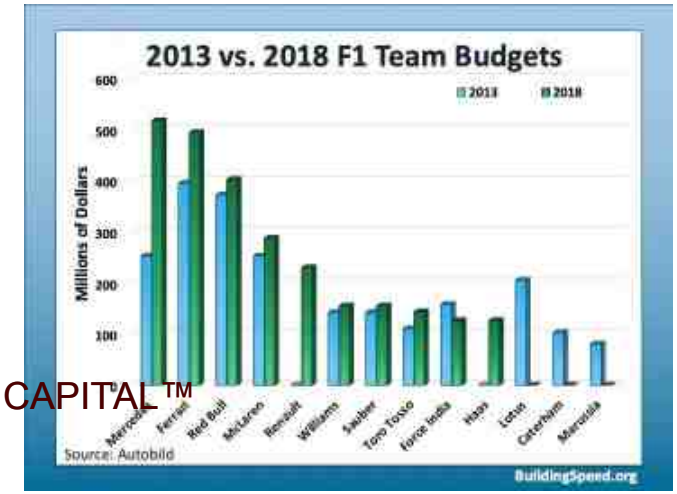
❸ True motivation: Owners wanted to receive a larger share of profit

Unlike NBA that has higher profits and teams with sustainable budgets, F1 lacks in both

NBA

Avg Team budget: ~$110M

	TEAM	2016/17	2017/18	2018/19	2019/20	2020/21
1	Cleveland	$129,407,297	$125,214,676	$125,639,481	$81,144,582	$0
2	Portland	$120,139,444	$134,356,849	$119,918,780	$116,763,887	$60,981,188
3	Detroit	$115,068,819	$85,333,174	$88,146,183	$84,698,017	$28,751,774
4	LA Clippers	$114,756,766	$109,888,162	$57,483,025	$0	$0
5	San Antonio	$111,353,989	$93,052,320	$82,445,203	$21,329,750	$0
6	Dallas	$110,128,511	$88,511,854	$56,071,871	$35,361,887	$0
7	Memphis	$109,555,690	$92,188,766	$83,251,936	$83,209,636	$34,002,130
8	Golden State	$107,079,254	$65,282,124	$36,488,258	$18,636,130	$0
9	Toronto	$106,493,038	$88,841,491	$78,124,301	$46,367,581	$27,719,475
10	Orlando	$106,231,564	$72,407,829	$60,038,262	$41,250,000	$17,006,000
11	Washington	$104,141,073	$84,928,433	$96,827,294	$50,804,025	$28,751,774
12	New York	$103,062,280	$75,372,484	$76,420,165	$41,195,885	$0
13	Miami	$101,372,443	$90,925,977	$88,626,527	$65,556,288	$0
14	New Orleans	$101,156,070	$79,268,928	$63,863,325	$61,826,869	$28,751,775
15	Milwaukee	$101,083,838	$109,268,139	$88,892,632	$58,102,855	$27,526,088



Avg Team budget: ~$250M

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Under the new C.A., if F1 has one bad year, all the teams will go bankrupt. Even in '20, Liberty had to bail the teams out.

Is the recurring possibility of the parent company saving the teams a safe business to invest in ?

F1 TEAM FINANCES

	Revenue	Costs	Net profit/loss
Ferrari*	£382.0m	-£464.0m	-£82.0m
Force India Formula One Team	£81.4m	-£109.1m	-£11.6m
Haas Formula	£100.0m	-£94.9m	£4.1m
Haas Formula Italia	£6.9m	-£6.2m	£0.4m
McLaren Racing	£190.3m	-£193.6m	-£3.2m
Mercedes-Benz Grand Prix	£289.4m	-£275.1m	-£3.8m
Mercedes AMG High Performance Powertrains	£140.4m	-£126.9m	£1.5m
Red Bull Technology	£247.8m	-£238.1m	£8.4m
Renault Sport Racing (UK)	£119.1m	-£121.0m	-£3.3m
Renault Sport Racing (France)	£191.1m	-£197.5m	-£8.8m
Sauber Motorsport**	n/a	n/a	n/a
Scuderia Toro Rosso	£127.3m	-£124.8m	£1.5m
Williams Grand Prix Engineering	£177.7m	-£170.8m	£5.9m
TOTAL	£2,053.4m	-£2,122.0m	-£90.9m

* All data is derived directly from 2016 financial statements, except in the case of Ferrari which is only partially derived from financial statements.
** Sauber is based in Switzerland and therefore does not file publicly available accounts.

Source: company accounts

4 **Capitalism works**: Lucrative prize money promotes competition

Many fans watch F1 to see the latest technology in motorsport and the fastest cars



The NFLX documentary portrays how Williams F1 team principal's strong desire to win pushed him to invest in the most innovative engineering technology and best drivers. The team eventually wins consecutively, elevating British people's love towards the sport because we love watching our countrymen winning at the global sport.

It's no different today. For top 3 teams to receive 48% of ~$1B prize money is what incentivized many car manufacturers and drivers to join F1 out of many similar motorsports. It's one reason why the marketing value associated with developing a F1 is huge.

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The team origin and driver's nationality position the brand more favorably in their homeland (e.g. Santander to increase visibility in Spain).

Sponsors bid significantly higher when that team/driver is doing well at the competitive motorsport, which is more fostered by the tremendous upside of winning top 3

Certainly, fans at the same time want to watch incredible overtake or thrilling close call rather than see the sport devolving into a game of engineering.

The point here is that striking a balance is a very difficult task and investors should not assume that that the new Concorde Agreement will turnaround the entire sport.

As much as there's possibility of it succeeding, investors need to discount the probability and the magnitude of the possible damage into the price of stock.

5 US GP '05: Why race in the same track that caused F1 to Crash?

Every stakeholders in F1's ecosystem each have its own interests that conflict with others'





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FIA refused a compromise proposal from 14 entrants who were asking for chicane installation following numerous failures with Michelin tires. It maintained that such rule changes would be unfair to the Bridgestone-shod teams.

So the 14 entrants boycotted by deciding not to participate. Only 6 cars from the teams using Bridgestone completed, angering the fans.

FIA's stance was regarded by many as hardening of the battle lines between the FIA president and the car manufacturers who back the idea of a breakaway championship in the face of what they see as the president's attempt to clamp down F1 with a raft of new regulations from the start of '08.

This is one example of many that illustrates **the hard-to-resolve political problems among teams, sponsors, manufacturers, fans, governing body, and the league with each have their own interests that conflict with those of others**. Michelin's strained relationship led to its withdrawal from the sport.

Liberty is doing its best with what they've got. But it's highly questionable whether the politics and complex misalignment of parties' interests would be achieved by adopting another raft of new regulations.

"unlike US sports where franchises agree to work for the common good, F1's teams have been nurtured in line with the divide-and-rule management style" – Chase Carey, F1 CEO

Source: https://www.theguardian.com/sport/2005/jun/20/formulaone.formulaone20051

❷ Circuit owners and countries lose money to host F1

They still host because the intangible value (increase country's recognition and reputation by hosting a iconic race) can't be quantified and the perceived value is good.

CONSTRUCTION COST OF A TYPICAL F1 TRACK

Cost	Amount
Earthworks, infrastructure and electric	$50 million
Asphalt (including safety fencing, run-off and drainage)	$75 million
Grandstands	$30 million
Pit building, team buildings and VIP hospitality building	$65 million
Media center	$15 million
Medical center	$5 million
Special electronics	$30 million
TOTAL	$270 million

Source: Formula Money

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Economic model: Government funds 60% of the race costs and 40% of is covered by the local promoters who gets their return through ticket sales.

Many countries no longer host F1: As you can see in the mini Singapore model, the country lost $1.9B by hosting the race for past 11 years. Singapore is one of the most well attended race and F1 is lost that significant amount for the perceived value. This is why numerous countries like Korea don't host anymore.





Source: https://f1i.com/news/77383-poor-returns-may-spell-demise-malaysia-gp.html/amp

However, F1 didn't have any major problems find a location because while there were numerous circuits around the world, there was only few auto racing sports and limited # of race. **So F1 had a bargaining power**

❸ F1's Bargaining Power is Structurally Declining

More balanced supply/demand for circuits with rising # of cost efficient motorsports

Malaysia decided to no longer host F1 after 19 years of hosting as they were losing money and the scarcity value diminished as other Asian countries hosted.

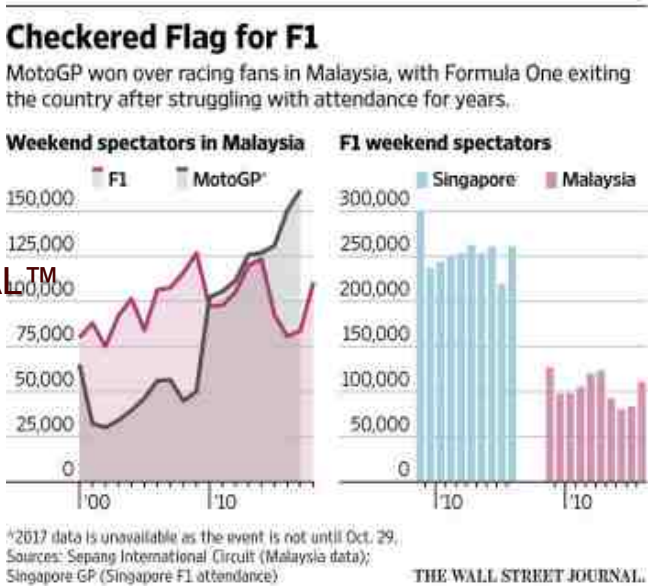
But Malaysia still hosts MotoGP, whose ticket sales and popularity remained quite strong in '17, all 120k seats were sold out for MotoGP race vs. 45k seats that were sold for F1 race in the same year)

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Before, Malaysia was willing to pay the highest promotion fees ~$45M because it would be one of the only 2 Asian countries to host it, after Japan

But now, with numerous Asian countries hosting, it also didn't make sense on that front as well

As a result, circuits are now less eager to line up for the costly race to become F1 Host



One of the best shorts is spotting company's competitive advantages deteriorating at an early stage....

Source: https://f1i.com/news/77383-poor-returns-may-spell-demise-malaysia-gp.html/amp

3 The Revenue Distribution in Other Sports vs. F1

	NBA	NHL	F1
Revenue split w/ Teams	**49% ~ 51% of Revenue**	**50% of Revenue**	*equivalent to **10% of Revenue***
Player Salary	If players' salary < Salary Cap*, they receive **10%** escrow paycheck back If > 90% of Salary Cap: Team Owners receive	If league makes its target: players receive their **19.56%** escrow paycheck back If it misses: Keeps some or all of the players' escrow money	20 Drivers were paid 10% of F1's revenue **but they are paid by each team**.
Team Budget	Teams need to **spend 90%+ on players** *(in '19, $109M)*	Teams spend up to the cap? the more the league will take out of escrow Teams spend closer to the cap floor? the league will take out of escrow	Even top teams **aren't making meaningful profits** as they spend ~$450M on R&D to maintain its lead

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While in other sports, teams/players share risk with the league, F1 wants to channel more of the upside to itself, although it's already the most profitable entity in the value chain.

F1's split= 68% of pre-team payment EBITDA

NBA's Salary Cap= $0.9\times \frac{0.4\ Rev-player\ benefits}{30\ (\#\ of\ teams)}$

Source: 1) https://www.forbes.com/sites/bryantoporek/2020/04/08/nbas-escrow-battle-over-player-salaries-has-only-just-begun/#9973a4d54e3e
2) https://cbabreakdown.com/salary-cap-overview
3) https://www.thedrive.com/accelerator/22168/behind-the-shadowy-billion-dollar-payouts-of-f1-nascar-and-indycar

4 Secular Movement towards ESG threatens F1

As the world is shifting away from combustion engines, F1 faces constant roadblocks



Formula E's value proposition are appealing and unique because of its

1. CSR (corporate social responsibility) messaging
2. Alignment with future of mobility is important to brands, and
3. The highest composition of younger demographics within the fan base (did I also say Formula E is cheaper to sponsor?)

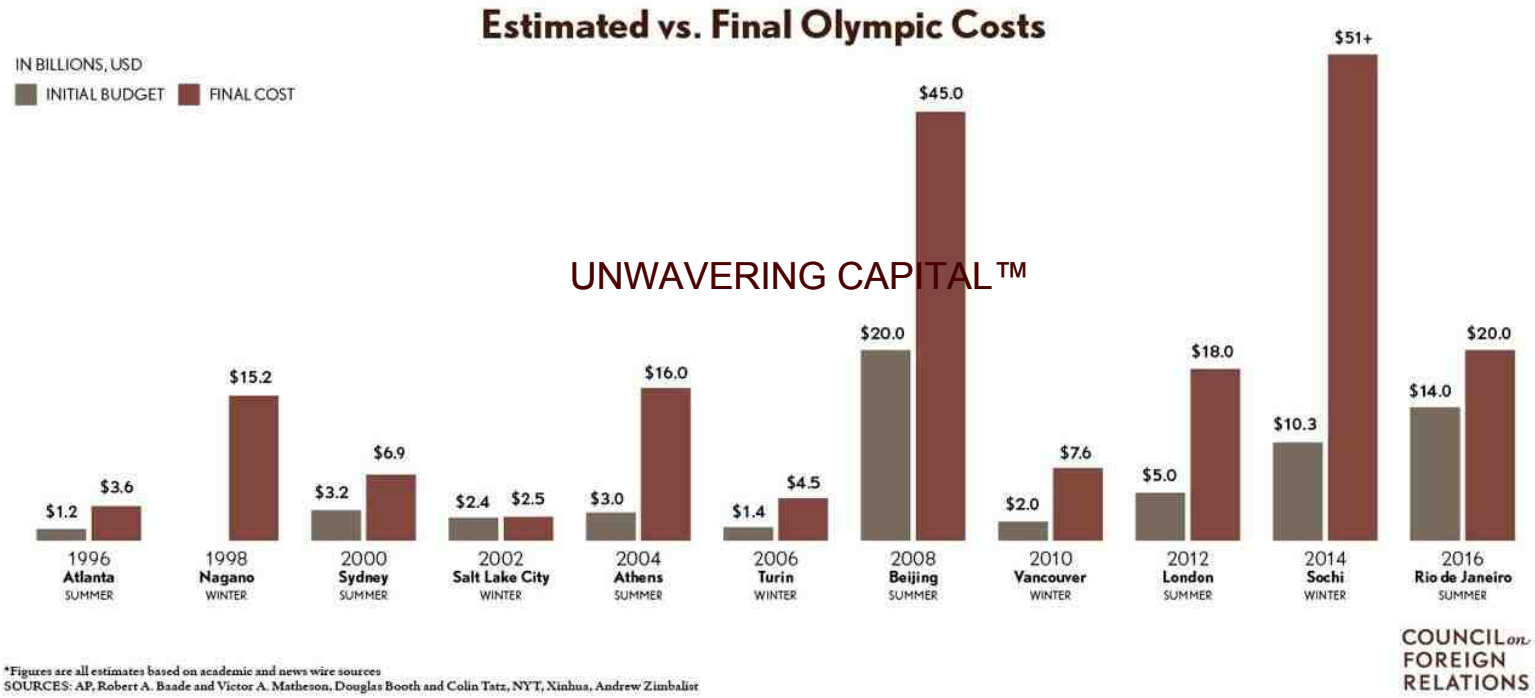
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While F1 wanted to host a street race in NYC, it never could. But Formula E has already staged 3 annual races. The global hubs are more willing to work with Formula E because the electric cars produce little noise and cities are where electric cars are most neeeded

https://motorsports.nbcsports.com/2017/07/23/how-formula-e-won-motorsports-race-to-new-york-city/
https://www.ft.com/content/2935aebc-d485-11e9-8367-807ebd53ab77

Pattern Recognition – Olympics

F1 will likely follow the same grid Olympics is taking in sharing the burden of hosting



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Source: https://www.cfr.org/backgrounder/economics-hosting-olympic-games

Sports' Revenue Streams and Monetization KPIs

F1 is the Most Monetized Sport although it's only #7 in Popularity

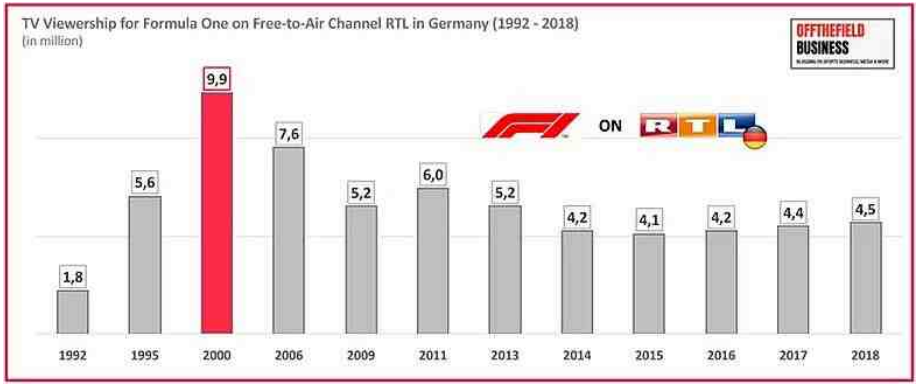
League	Sport	Revenue				# of					
		Total	Total Broadcasting	Sponsorship	Ticketing (Promotion Fee)	Fans	Match Attendee	Teams	Matches *or Races*	Total TV viewers	Hours of Content
--	--	*in M*				*in K*	*in M*	*in single*		*in M*	*in single*
NBA	Basketball	**$4,800**	$2,700	$1,300	$800	39	17	30	1,312	1,574	2,952
EPL *(England)*	Soccer	**$6,233**	$4,333	$1,300	$600	268	15	20	380	4,700	570
NFL	Football	**$13,000**	$7,200	$1,320	$4,480	251	16	32	267	4,406	844
NHL	Hockey	**$4,430**	$633	$1,937	$1,860	86	22	31	1,358	6,790	1,358
MLB	Baseball	**$9,500**	$1,500	$938	$1,000	170	110	30	2,467	110	7,401
Indian Premier League	Cricket	**$6,300**	$4,325	$1,500	$475	2,500	68	8	60	1,500	360
WWE	Wrestling	**$960**	$743	$70	$147	20	1	113	500	800	3,500
Moto GP	Racing	**$460**	$207	$92	$161	100	3	11	20	300	15
Nascar	Racing	**$953**	$256	$587	$110	45	0.5	8	24	70	72
Formula E	Racing	**$221**	$44	$110	$67	137	0.4	13	15	411	11
IndyCar	Racing	**$66**	$20	$25	$21	0.4	0.3	12	17	1.1	59.5
League Average	--	**$4,266**	**$1,996**	**$834**	**$884**	**329**	**23**	**28**	**584**	**1,878**	**1,558**
F1	Racing	**$2,022**	$754	$754	$605	500	4	10	21	1,922	126

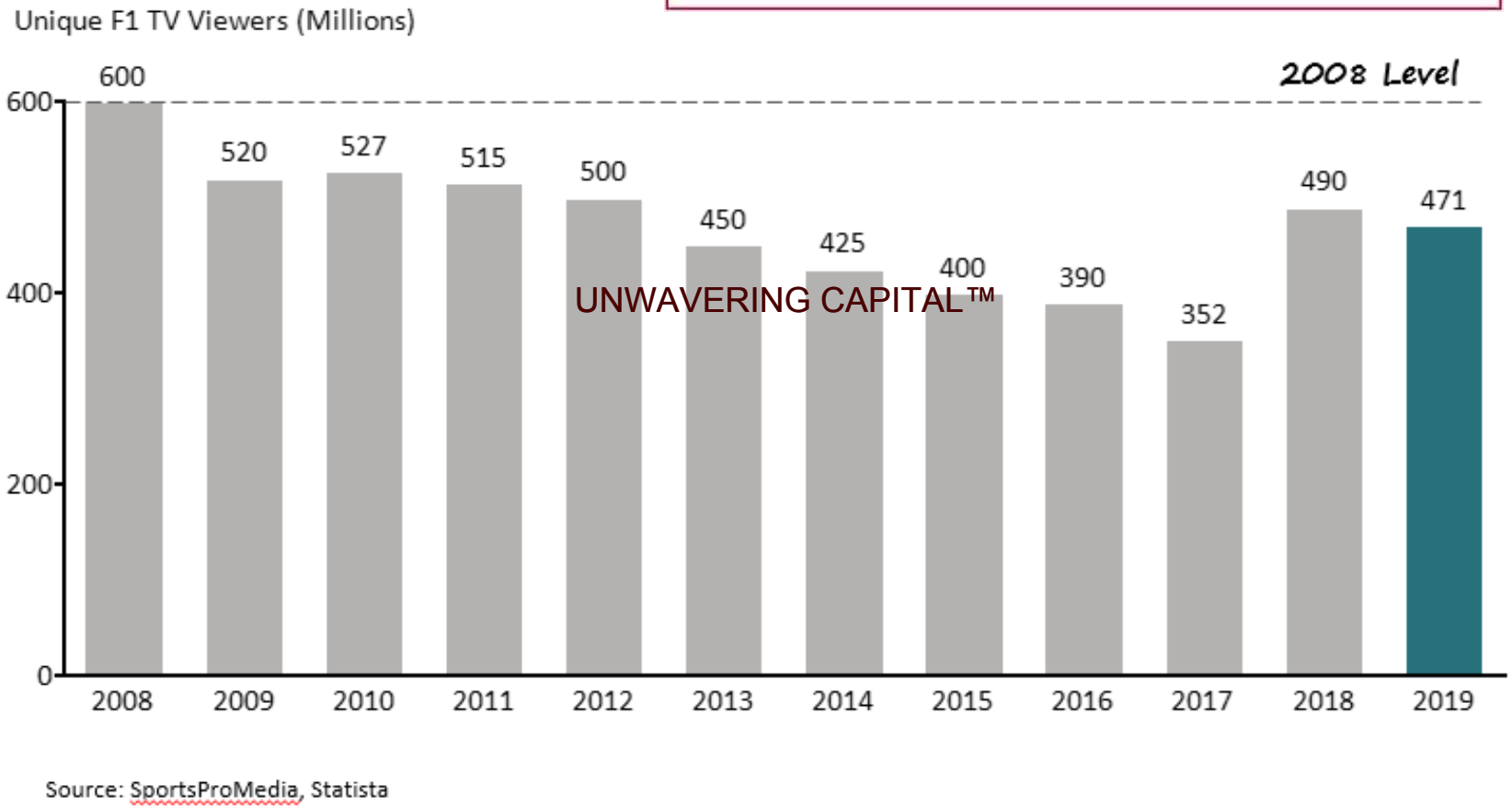
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Source: https://www.autosport.com/f1/news/129388/formula-1-team-payments-for-2017-revealed
https://joesaward.wordpress.com/2014/11/05/the-f1-financial-structure-explained-in-four-sentences/

Thesis 3 –F1's Upside is Limited

TV Viewership





Source: SportsProMedia, Statista

“Know your blind spots, all spectrum of scenarios and the full landscape”

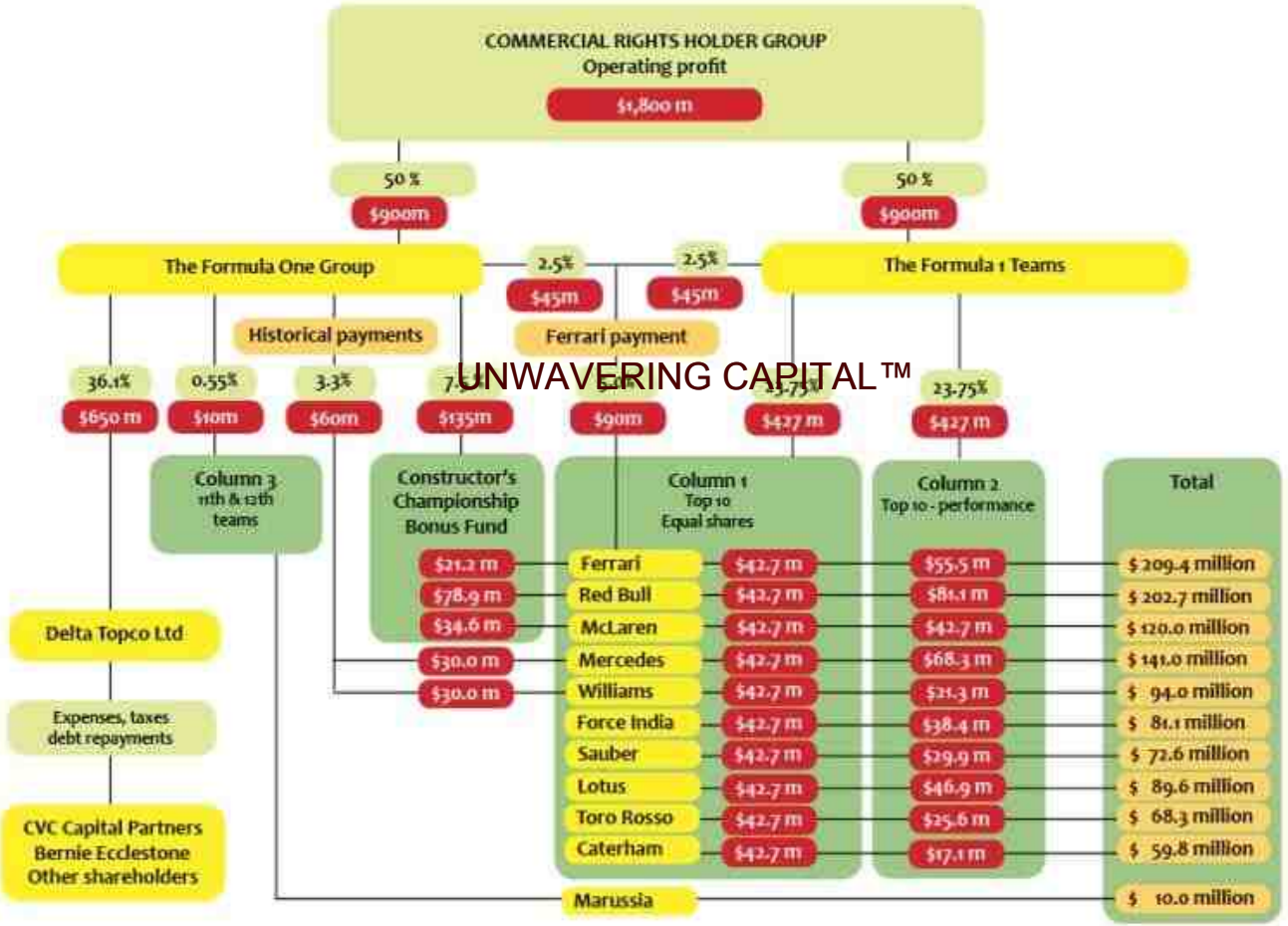
- Phil Lee

Risk

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F1 Financial Structure and Team Payments Rules are rocket science

Team payment, the biggest cost component, is 64% of F1's pre-team payment EBITDA

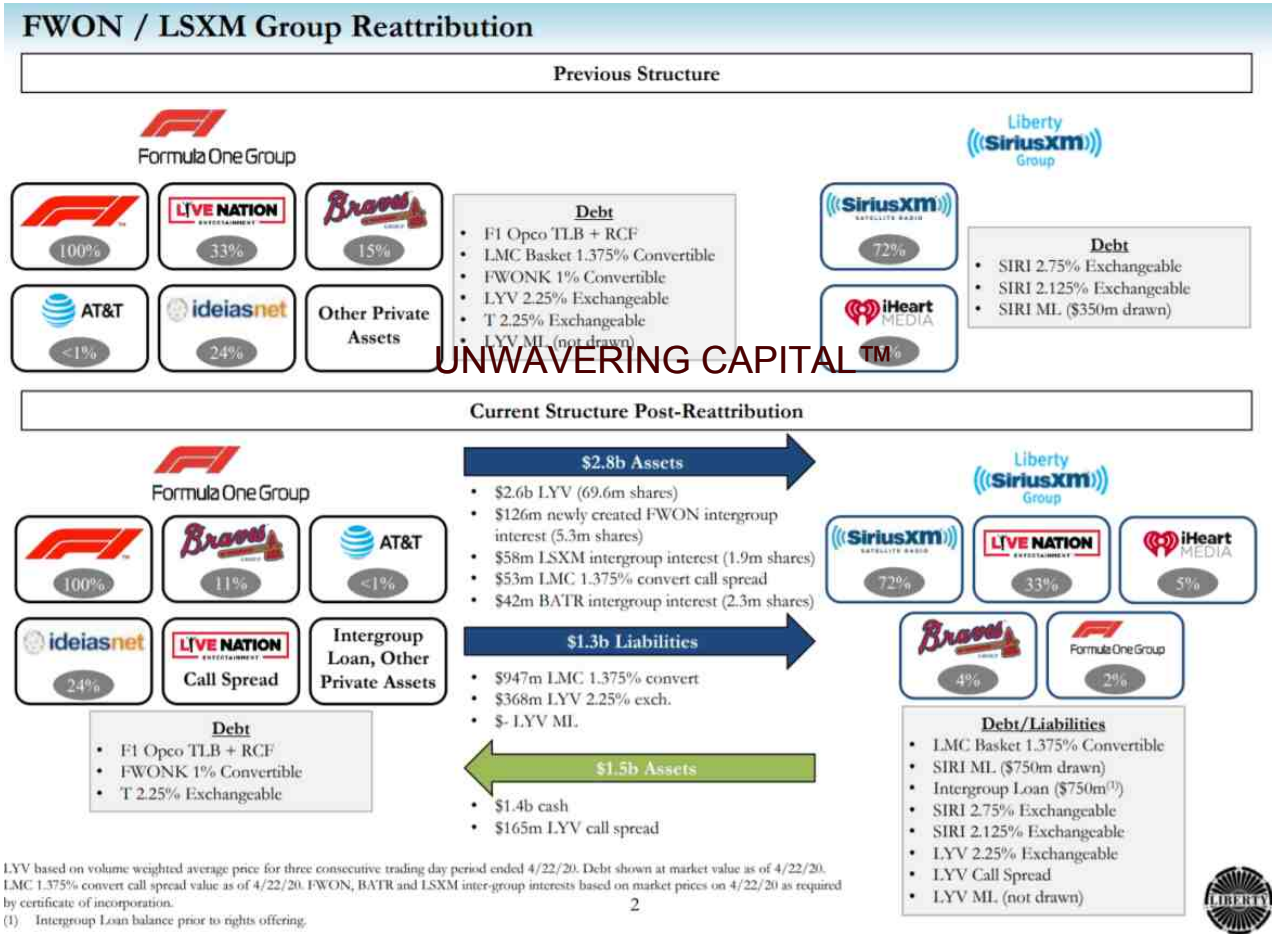


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Source: https://www.autosport.com/f1/news/129388/formula-1-team-payments-for-2017-revealed
https://joesaward.wordpress.com/2014/11/05/the-f1-financial-structure-explained-in-four-sentences/

LYV Attribution Deal was a boon for FWONK

*BUT You don't know what Liberty's new transactions would either **help or hurt** you. Its primary interest is the Liberty franchise.*



Source: Liberty Media Investor Presentation.

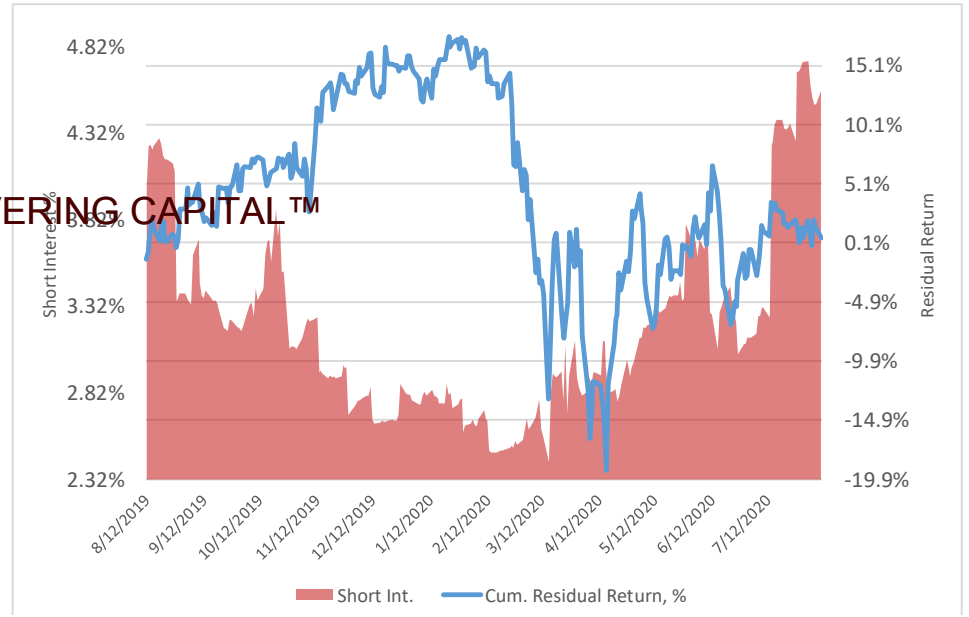
Residual Returns around Earnings and SI Chart

Event Liquidity, a key metric in this market, looks favorable

Residual Return Around Earnings

Release Date	-11 to -7	-6 to -2	-1 to 1	2 - 6	7 - 11
8/10/2020	0.0%	0.7%	1.8%	0.0%	0.0%
5/7/2020	4.3%	5.5%	(7.6%)	2.2%	0.5%
2/26/2020	(2.4%)	0.8%	(7.1%)	(4.1%)	(5.0%)
11/11/2019	1.3%	(4.2%)	7.1%	1.9%	0.7%
8/8/2019	0.1%	2.4%	5.6%	1.3%	(1.0%)
5/9/2019	1.8%	(1.1%)	1.4%	0.4%	3.4%
2/28/2019	(3.9%)	2.3%	4.2%	0.3%	3.2%
11/8/2018	0.8%	(0.5%)	(2.5%)	(1.1%)	(2.2%)
8/8/2018	(1.1%)	(2.4%)	(1.6%)	0.1%	2.8%
5/9/2018	(0.5%)	4.1%	(5.2%)	2.6%	3.1%
3/1/2018	(0.1%)	(3.4%)	(0.7%)	(1.6%)	0.4%
11/9/2017	(2.3%)	0.3%	(1.5%)	1.0%	0.1%
Mean	(0.2%)	0.4%	(0.5%)	0.2%	0.5%
Median	(0.0%)	0.5%	(1.1%)	0.4%	0.4%
# Winners	6	7	5	8	8
# Losers	6	5	7	3	3
Hit Rate	50.0%	58.3%	41.7%	72.7%	72.7%

Short Interest vs. Residual Return



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Outdoor Ads / Billboard

Executive Summary

	$ in thousands, except share and per share data	Low	Base	High
Scenario	Vaccination Rollout (~90% efficacy & 50% coverage of US population)	> Oct 2021	July - Sep 2021	< July 2021
	People Traveling (as % of '19 levels)	50~65%	65~80%	80%+
	US GDP Growth ('21-'22)	< 1.5%	1.5%-3%	3%+
	LAMR's DOOH Penetration Rate ('22)	**< 37%**	**37-45%**	**> 45%**
	Shares Outstanding (in M)		86.4	
Adj. Forecasts	**Revenue CAGR ('19-'22)**	**3.1%**	**5.6%**	**6.1%**
	Terminal Growth Rate ('30)	**3.00%**	**3.50%**	***3.75%***
	NOPAT Margin ('30)	30.0%	37.0%	38.0%
	Beg. Operating NWC /Rev ('30)	30.0%	11.0%	13.0%
	Beg. Net Op. LTA/Rev ('30)	100.0%	60.0%	55.0%
	Net Debt / End. BV of Net Capital	-10.0%	-25.0%	-30.0%
Output	Total Rev (2022)	*($0)*	*$1,884*	*$1,980*
	vs. Consensus	*-100.0%*	*9.6%*	*15.2%*
	Target Price ('22)	**$33.67**	**$102.71**	**$158.16**
	Upside/(downside)	***-59%***	***26%***	***94%***
	Probability of Likelihood	25%	40%	35%
	Prob-weighted TP	$8.42	$41.08	$55.36
	Weighted Avg. TP		**$104.86**	
	Upside/(Downside)		*28.8%*	
	Prob. Weighted IRR		13.5%	

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LAMR (Lamar Ad)	Dec/26/2020
Share Price (USD)	$81.39
Shares Outstanding *(M)*	86.4
Market Cap ($B)	**$8,208**
- Cash	$69
+ Debt	$4,173
Enterprise Value ($B)	**$12,312**
Dividend Yield	2.46%
Short Interest as % of float	*1.9%*
Ddays to Cover	3.5
P/AFFOx (LTM)	17.8x
Forward P/AFFOx ('22)	**11.7x**
Net Debt / EBITDA ('20)	6.4x

Key Investment Positives

1. LAMR operates the largest network of digital billboards in the US and growing digital platforms the company to tap into expanding programmatic advertising channel

2. Least affected by the COVID-related volatilities within the OOH space

3. REIT-status awards LAMR with tax advantages (avoid double taxation), additional analyst coverage, and access to REIT investors that would otherwise overlook LAMR

4. Diversified customer base and real-estate portfolio

Key Investment Negatives

1. Customer concentration risk

2. Possibility of structural decline in traveling

3. Cyclical, high beta, and GDP-driven

Industry Analysis

Industry structure

Widening Moat (durable competitive advantages) prevents new companies from penetrating the market, enabling LAMR to sustain its pricing power: The Highway Beautification Act requires states to maintain "effective control" on the number and location billboards. For instance, federal, state, and local OOH regulations typically prevent constructing a new billboard within a certain distance of the existing structure.



Obtaining permits to have an OOH ad is structurally challenging as the proposed signs have to conform to both federal and state law in addition to securing approval from the municipality (the applicant must hold a public hearing or receive local approvals before construction can begin). Many existing structures have been grandfathered in and can't be rebuilt by another operator without a zoning variance. The control of permit protects current inventory and prevents encroachment. LAMR, not landowner, typically owns permits for a given location. LAMR's permits, which are the most valuable assets obtained in an acquisition, have been collected throughout its 118-year history.

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OOH, regulations essentially entrench a deep moat around the industry, making it difficult for a new player to penetrate and for the industry incumbents to have stable market shares and profitability over a long time. For instance, LAMR's core billboard business supports best-in-class 40%+ consolidated EBITDA margins with analog and digital growth opportunities.



Key Players

Outfront Media (OUT): It offers industry services to clients across North and South America. The number of DOOH increased to 7,266 in 2017. 17% of OUT's total expenses are accounted for by municipalities transit operators under specific ad contracts (e.g., New York MTA) calculated by its revenue. It has high transit exposure in large cities because it

inherited the old legacy assets from its previous entity, CBS Outdoor. It was a division of CBS until March 2014. at which point it was spun off into an independent public company. CBS Outdoor acquired Van Wagner Communications' billboard business for $690M in July 2014 and started to operate as a REIT.

Clear Channel Outdoor (CCO)

The US-based company operates 460k ad displays worldwide with operations in Europe, Latin America, and Asia.

JCDecaux Group

Although it has a relatively small stake in the US market, it is the world's largest OOH advertiser, with operations focused in Europe and Asia.

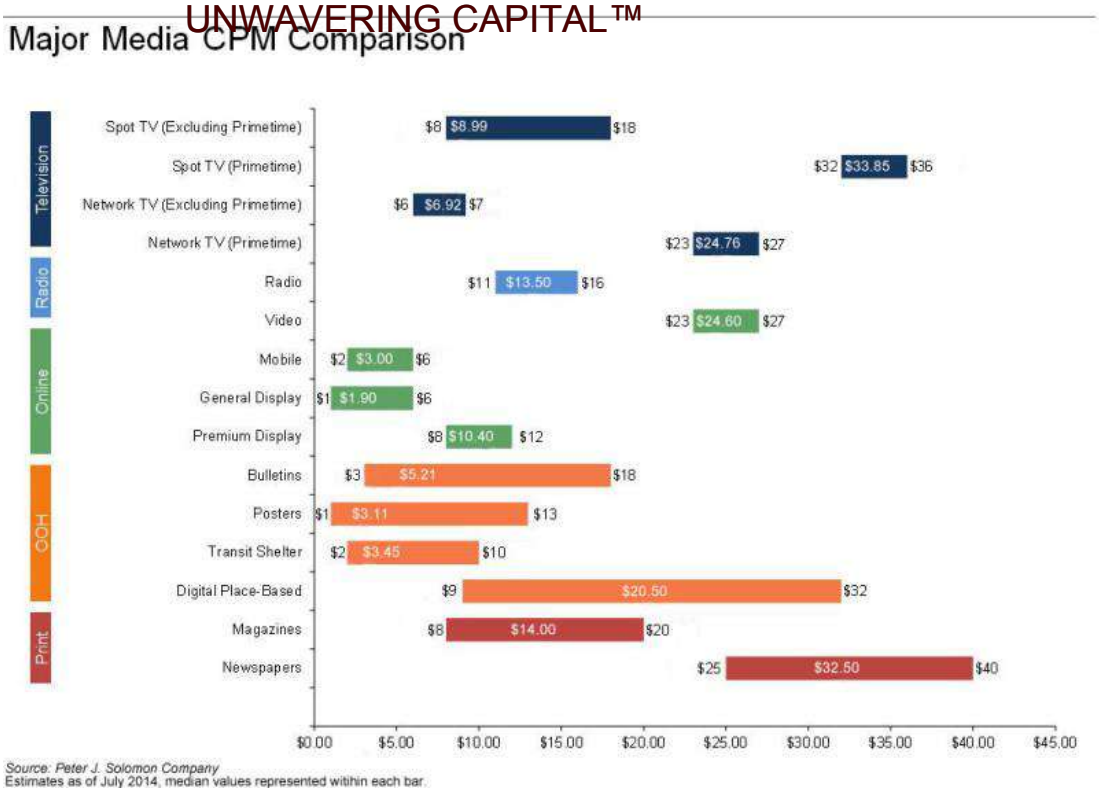
Primary Performance Metrics

CPM (cost per 1000 impressions): Impressions are how many times your ad unit was displayed to a user. CPM is a measure of the worth and cost of a specific market campaign or channel.

Reach: # of people who saw your ad unit. This is different than impressions as multiple impressions to the same person would still result in a Reach of 1. For campaigns focused on increasing brand awareness or reaching a target number of people, Impressions and Reach are the primary KPIs.

ROI: assesses the effectiveness of ad spending. How much value the ad channel helped create considering the variant ad costs: increase revenue, generate leads, or drive other valuable customer activity.

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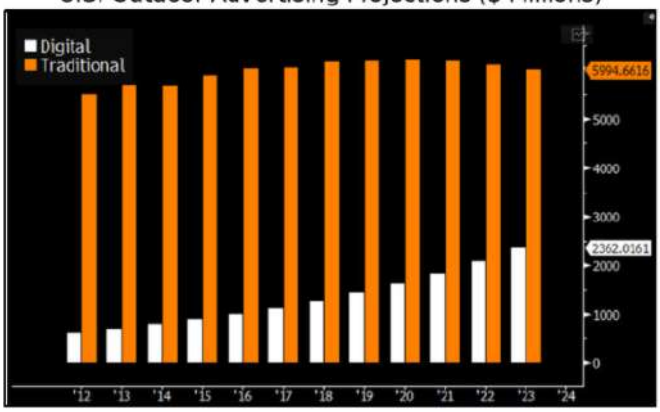
Industry Size and Future Landscape

$6.2B US OOH ad market with a CAGR of -5.8% from 2015 through 2020: It is projected to grow at a CAGR of 3.1%.

Increasing penetration of DOOH accelerates the industry's growth rate: DOOH penetration grew from 17% in 2015 to ~33% of total ad products in 2020. It is projected to be 42% in 2023 as the industry continues to digitalize its existing assets.

Billboards constitute 62% of the total ad inventory composition: The other product segments are alternative and other leased displays (13.6%), transit displays (12.3%), and street furniture and urban fixture displays (11.9%).

U.S. Outdoor Advertising Projections ($ Millions)



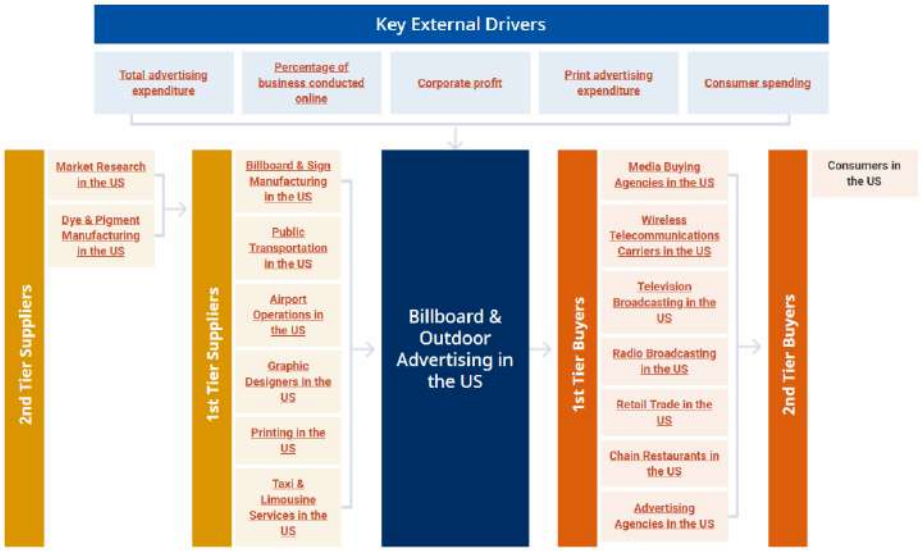
Key Success Factor

1) ability to negotiate with regulators: Also need to be capable of attracting local support/patronage to increase revenue by raising occupancy

2) securing revenue through key contracts: Having displays locked into medium and long-term contracts will ensure good CF for an operator

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3) ability to provide goods/services in diverse locations: to reach a mass market, many national advertisers must be provided a variety of sites across several display forms (e.g., bulletins and posters)



4) Displays in crucial markets: Advertisers choose locations based on demographics and # of impressions. Offering advertisers locations that maximize those factors will increase a company's success

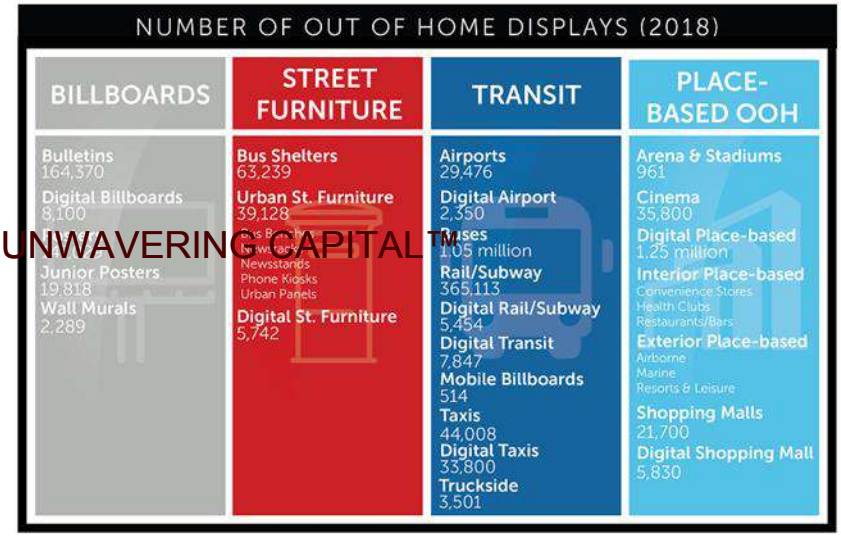
5) Ability to compete on tender: The ability to compete on a tender basis ensures that display locations are obtained at an economical rental rate.

Types of OOH Products and their Value Proposition

1) Bulletins is the largest format ad structure located on major highways. Therefore, the permanent bulletins' primary customers include restaurants, lodging, and local gas stations. It commands drivers' attention with 3D designs, moving parts, and extensions. **2) Posters** are smaller ad structures located on traffic arteries and are designed to be mass-produced and posted in multiple locations. **3) Jr. Posters** are located mainly in urban neighborhoods and on smaller roads. They are often used for their proximity to retail businesses where they can stimulate sales. **4) Wallscapes** are large and customized structures in major metropolitan cities in the landmark locations (e.g., Times Square).

Transit ads, which are moving billboards often found in major metropolitan cities, are displayed in a bus, taxicab, and subway: Advertisers can target specific demographics based on route and deliver exposure where other product types of OOH may be prohibited. Pedestrians, commuters, and vehicular traffic see them

Shelters reach consumers walking by or waiting for the bus, making them useful for point-of-purchase and directional ads. **Bench ads** are effective media for point-of-purchase marketing near supermarkets, malls, movie theaters, and tourist attractions. They establish a strong local presence in the community.



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The ads of the **digital billboards**, for instance, rotate in a slide show fashion every 6~8 seconds. The enterprise customers can change their message as often as they want with no production cost. They can also stream live data and user-generated content from their website/social media in real-time. According to the Nielsen Airport Insights Study, after seeing that brand's airport ad, 42% of frequent flyers will visit a website or store in the airport, while 90% are likely to shop at a brand's brick mortar location. Also, 20% say they have purchased an item they saw advertised.

Programmatic Digital OOH (DOOH) ads are computer-controlled electronic displays with technological capabilities that allow the advertisers to measure OOH's effectiveness (targeting, measurability), engagement, and efficiency (flexibility, quicker lead times). While programmatic buying makes it easier for ad campaigns to be adjusted on the fly, the way data is used for

targeting DOOH differs from how users are targeted online. OOH is still a one-to-many medium, so it doesn't offer one-to-one targeting like an online ad.

Company Analysis



Lamar (LAMR): Founded in 1902, it's the largest pure-play outdoor advertising company with 155k displays across the US and Canada. It is a single-segment company that operates billboard displays, logo signs, and transit ads. Static billboards generate 70% of revenue, with digital making up 20%+, and Transit and logo displays comprising the rest.

Despite being a family-owned company, LAMR's management executes well and has been sustainably generating shareholder value over a long time.

Strategy Analysis

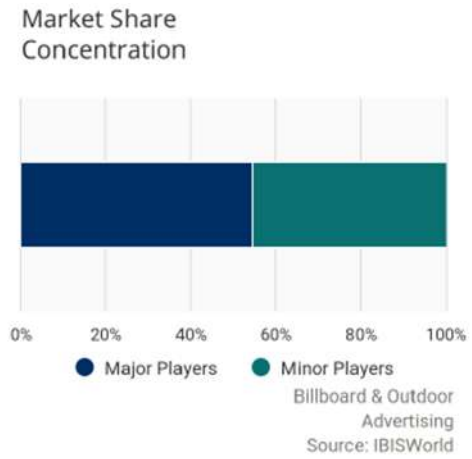
Lamar's Recent M&A

	A	Effective Action Type	Ticker / ID	Summary
1)		11/01/17 Acquisition	LAMR US	Target: Catalyst Outdoor Advertising, Sought: 100.00%
2)		08/04/17 Acquisition	LAMR US	Target: Steen Outdoor Advertising Inc, Sought: 100.00%
3)		01/07/16 Acquisition	LAMR US	Target: 5 Billboard Assets, Sought: 100.00%
4)		07/01/15 Acquisition	LAMR US	Target: Alliance Corp/NV, Sought: 100.00%
5)		12/11/14 Stock Buyback	LAMR US	Open Market for Class A; 250.000M worth of Shares
6)		08/05/14 Acquisition	LAMR US	Target: Marco Outdoor Advertising Inc, Sought: 100.00%
7)		10/31/12 Acquisition	LAMR US	Target: Nextmedia Outdoor Inc, Sought: 100.00%

Source: Bloomberg

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LAMR's strategy is to consolidate via acquisitions to realize synergies and benefit from the higher economies of scale: LAMR and OUT have been acquisitive. LAMR, for instance, spent $477M on acquisitions in 2018, notably acquiring Steen's 460 billboards.



The acquisition strategy makes sense, given the OOH industry structure. Due to permitting restrictions, an organic initiative such as building new billboards is limited. Also, LAMR is the market leader in a fragmented industry. The top 3 oligopolies make up 57% of the market based on revenue. The rests are 12,807 mom and pop outdoor ad operators. IBISWorld expects the number will continue to grow by 1.2% through '25. If there are high-quality assets that are poorly managed by inexperienced operators, LAMR's competent management has an opportunity to make better use of those inventories.

Accounting Analysis

Accounting Policies

2020 AFFO GUIDANCE RECONCILIATION

	Year ended December 31, 2020	
	Low	High
Net income	$ 201,200	$ 217,700
Depreciation and amortization related to advertising structures	237,600	237,600
Gain from disposition of real estate assets	(6,000)	(6,000)
Adjustment to minority interest - consolidated affiliates	700	700
Funds from Operations	$ 433,500	$ 450,000
Straight-line expense (income)	3,000	3,000
Capitalized contract fulfillment costs, net	1,000	1,000
Stock-based compensation expense	14,500	18,000
Non-cash tax (benefit) expense	(2,000)	(2,000)
Non-real estate related depreciation and amortization	12,400	12,400
Amortization of deferred financing costs	6,000	6,000
Loss on extinguishment of debt	25,300	25,300
Capitalized expenditures - maintenance	(24,000)	(24,000)
Adjustment for minority interest - consolidated affiliates	(700)	(700)
Adjusted Funds From Operations	$ 469,000	$ 489,000
Weighted average diluted shares outstanding	$ 100,900,000	$ 100,900,000
Diluted earnings per share	$ 1.99	$ 2.16
Diluted AFFO per share	$ 4.65	$ 4.85

Funds From Operations (FFO) and Adjusted FFO (AFFO) *are two non-GAAP financial measures that are defined by the National Association of Real Estate Investment Trusts (NAREIT) to be indicators of cash flows generated by REITs.* ***FFO*** *is net income before g/l from the sale/disposal of real estate assets and investments and real estate related D&A and including adjustments to eliminate NCI.*

I agree with classifying depreciation and amortization as a non-cash expense as they are accounting measures to spread out the cost of their assets. Since they reduce NI for the accounting period, D&A should be added back to NI to determine the incoming cash. This adjustment is critical to REITs because their significant assets are depreciable physical properties, and these expenses don't impact the cash a REIT makes.

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I also think adjusting for gain or loss from real estate transactions given that LAMR only owns 18% of its billboard billing, 30% of its digital structures, and ~10% of billboard locations' easements (i.e., property beneath). Instead, LAMR primarily leases from the landowners. Its principal revenue generation activity is displaying ads rather than investing and divesting real estate assets to generate capital gains.

Moreover, although the numbers are so small and insignificant, adjusting for NCI also makes sense given that as a common shareholder, you don't want to capture the portion of a subsidiary corporation's stock that's not owned by the parent corporation.

According to NAREIT, FFO is the most accepted measure of a REIT's operating performance. It provides guidelines on how REITs should calculate their FFO to be a useful measure for comparing LAMR's operational results to other companies. However, the guideline only serves as a supplementary figure, and some companies use different FFO formulas to report info. As a result, more adjustments may be needed for apple-to-apple comparison.

AFFO *is defined as FFO before 1) straight-line revenue and expense, 2) stock-based compensation expense, 3) non-cash tax expense (benefit), 4) non-real estate D&A, 5) amortization of deferred financing and debt issuance costs, 6) loss on extinguishment of debt, 7)*

non-recurring infrequent or unusual losses (gains), 8) less maintenance capital expenditures, and 9) an adjustment for NCI, 9) impact of ASC 842 adoption (which mandates all leases to be capitalized on the balance sheet).

I believe many of these adjustments make sense given that AFFO effectively tries to capture the returns that core-operational activities generate. Given that LAMR isn't a bank that primarily generates money from financial transactions, adjusting for number 5 and 6 reflect the economic substance. Adjusting for number 7 is also correct because by doing so, investors can compare period to period results on a more consistent basis without the effects of one-time items.

Investors use AFFO as a better indicator of the REIT's ability to pay dividends from its net earnings. Thus, I believe adjusting recurring rent expenditure (#1), which is distributed over the property's life, reflects the economic sense because they are required to display ads and generate revenue. Those payments aren't included as dividends for shareholders. Adjusting number 8 is also a reasonable adjustment because maintenance costs are recurring expenditures required to keep the real estate property running and generating revenues.

As for SBC, however, I think the classification is in a grey area. It's the equivalent of paying it in cash and raising the same amount of cash from shareholders via equity. Hence, it's both an expense and a shareholder dilution (economic cost). I argue that it should be added back to Financing cash flow as a deemed cash capital raise. This is the proper treatment for two transactions – one an expense and the second a funding that have been melded together.

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NAREIT lacks a specific definition of AFFO, and it means that REITs enjoy greater flexibility on what adjustments to make to the FFO to get the final FFO value. I perceive AFFO as a better measure of residual cash flow for shareholders because these additional adjustments can't be paid out to shareholders as dividends. Therefore, it illustrates a clearer picture of the REIT's dividend-paying ability.

To conclude, I believe these two indicators aren't considered to indicate cash flows from operating activities as a measure of liquidity or funds available to fund LAMR's cash needs, including its ability to make cash distributions. Instead, I would assert that they are a useful indicator of LAMR's current operating performance because each is a key measured used by its management team for purposes of decision making and for evaluating its core operating results.

Essential line items on the Financial Statements

AFFO/share and Distribution/shr: As mentioned in the accounting policies, these two measures how much LAMR's shareholders will be getting from investing in REIT. In addition to the profitability indicators, they are also risk measures. As a REIT, LAMR is required to distribute to its stockholders concerning each taxable year at least 90% of its REIT taxable income (excluding capital gains and NOL carryforwards) to qualify as REIT. Failure to make sufficient distributions

would jeopardize its qualification as a REIT and would subject it to US federal income and excise taxes

Growth Capex: LAMR's flexible business model allows for moderation of CapEx spend in an economic downturn. It reduced the 2020 Capex from planned $130M to approximately $65M. Also, given that investment in digital billboards and prudent acquisitions enhance FCF. So, it can be a good barometer of future FCF for shareholders.

Financial Analysis

Ratio Analysis

Stable NOPAT Margin ranges from 26% to 28% (2015-2019): The ratios perfectly match my expectations based on my understanding of the business. Ex-CBS Professor, Bruce Greenwald, said that consistent profitability and stable market share (explained in the industry section) indicate the incumbent's durable competitive advantages over a long time. And since I knew that the OOH industry has a deep moat around the sector (as I indicated in the industry analysis section) and LAMR has durable competitive advantages (as

These ratios are calculated based on adjusted B/S and I/S (lease and other adjustments incl

Ratios based on Beginning Balance Sheet Values

	DECOMPOSING PROFITABILITY: DUPONT ALTERNATIVE	2015	2016	2017	2018	2019
	NOPAT / Sales	26.1%	27.8%	28.7%	25.0%	28.3%
x	Sales / Net Operating Assets		0.51	0.46	0.46	0.44
=	**Operating ROA**		**14.3%**	**13.1%**	**11.5%**	**12.6%**
	Spread		8.0%	7.7%	6.4%	7.3%
x	Net Financial Leverage		1.86	2.16	2.21	2.53
=	Financial Leverage Gain		14.9%	16.6%	14.1%	18.5%
	ROE (Operating ROA + Financial Leverage Gain)		**29.2%**	**29.7%**	**25.6%**	**31.0%**

	EVALUATING OPERATING MANAGEMENT	2015	2016	2017	2018	2019
	Ratios based on Ending Income Statement Values					
	Key Growth Rates:					
	Annual Sales Growth		10.9%	2.7%	5.6%	7.8%
	Annual Net Income Growth		13.8%	6.3%	-10.9%	22.2%
	Key Profitability Ratios:					
	Sales / Sales	100.0%	100.0%	100.0%	100.0%	100.0%
	Cost of Sales / Sales	35.0%	35.0%	35.1%	34.5%	33.6%
	Gross Margin	**65.0%**	**65.0%**	**64.9%**	**65.5%**	**66.4%**
	SG&A / Sales	21.3%	21.1%	21.3%	22.9%	23.0%
	Other Operating Expense / Sales	16.1%	15.6%	14.3%	15.7%	15.9%
	Investment Income / Sales	0.0%	0.0%	0.0%	0.0%	0.0%
	Other Income, net of Other Expense / Sales	0.7%	0.8%	0.3%	-1.2%	0.5%
	EBIT Margin	**28.3%**	**29.1%**	**29.5%**	**25.7%**	**27.9%**
	Net Interest Expense (Income) / Sales	7.3%	8.2%	8.3%	8.0%	8.6%
	Pre-Tax Income Margin	**21.0%**	**20.8%**	**21.2%**	**17.7%**	**19.3%**
	Taxes / Sales	1.6%	0.9%	0.6%	0.7%	-0.1%
	Unusual Gains, Net of Unusual Losses (after tax) / Rev	0.0%	0.0%	0.0%	0.4%	0.4%
	Net Income Margin	**19.4%**	**19.9%**	**20.6%**	**17.4%**	**19.8%**
	EBITDA Margin	42.4%	42.7%	43.2%	54.2%	56.7%
	NOPAT Margin	26.1%	27.8%	28.7%	25.0%	28.3%
	Recurring NOPAT Margin	25.5%	27.0%	28.4%	25.8%	27.5%

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mentioned in the company analysis section), I have predicted that LAMR's market share and profitability (NOPAT margin) will be stable.

Operating Asset Turnover is also stable (2.2 in '15 to 2.3 in '19): The ratio is an efficiency ratio that identifies a company's operating assets' revenue generation capabilities. Therefore, for every dollar invested in its operating assets, $2.33 of revenue is generated (using '19 #s). I was also expecting this trend. LAMR is a 120 years old OOH operator that generates most of its revenue (76% in 2019) from a less volatile local business with a diversified base of 40k+ billboard tenants, and no single tenant accounts for more than 2% of sales. Furthermore, its geographical diversified market position limits transit exposure.

EVALUATING INVESTMENT MANAGEMENT	2015	2016	2017	2018	2019
Ratios based on Beginning Balance Sheet Values					
Working Capital Management:					
Operating Working Capital / Sales		2.6%	2.4%	-0.2%	5.2%
Operating Working Capital Turnover		38.39	41.77	-495.80	19.22
Accounts Receivable Turnover		8.60	8.11	8.07	7.44
Inventory Turnover		NA	NA	NA	NA
Accounts Payable Turnover		30.12	30.64	31.28	27.77
Days' Receivables		42.43	44.98	45.24	49.03
Days' Inventory		NA	NA	NA	NA
Days' Payables		12.12	11.91	11.67	13.14
Long-Term Asset Management:					
Net Long-Term Assets Turnover		0.52	0.46	0.46	0.45
Net Long-Term Assets / Sales		191.9%	217.1%	218.0%	220.4%
PP&E Turnover		1.37	1.30	1.34	1.40
Depreciation & Amortization / Sales	14.1%	13.7%	13.7%	28.5%	28.8%
VALUATING FINANCIAL MANAGEMENT	**2015**	**2016**	**2017**	**2018**	**2019**
Ratios based on Ending Balance Sheet Values					
Short-Term Liquidity:					
Current Ratio	1.17	1.14	1.29	0.80	0.46
Quick Ratio	0.81	0.81	0.97	0.56	0.42
Cash Ratio	0.09	0.13	0.35	0.05	0.04
OCF Ratio (adj. by after-tax net interest expenses)	2.42	2.35	2.06	1.59	1.19
Debt and Long-Term Solvency:					
Liabilities-to-Equity	2.32	2.65	2.82	3.02	4.03
Debt-to-Equity	1.88	2.20	2.32	2.55	2.52
Net-Debt-to-Equity	1.86	2.16	2.21	2.53	2.50
Debt-to-Capital	0.65	0.69	0.70	0.72	0.72
Net-Debt-to-Net Capital	0.65	0.68	0.69	0.72	0.71
Interest Coverage Ratio:					
Interest Coverage	3.89	3.52	3.54	3.27	3.29
Payout Ratio:					
Dividend Payout Ratio	101.3%	98.5%	77.0%	156.7%	111.5%
Sustainable Growth Rate (ROE based on beginning balance):		0.4%	6.8%	-14.5%	-3.6%

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Spread again has no significant volatility (8% in '16 to 7.3% in '19): The stable trend isn't surprising because NOPAT margin and operating asset turnover (although the formula is reversed to sales / NOA) are relatively consistent, as mentioned earlier. A relatively high spread indicates LAMR's management's competency to generate high returns that exceed the cost of capital.

Net financial leverage is increasing (1.86 in '16 to 2.53 in '19): LAMR acquired many OOH operators and assets before COVID (as expected given its acquisitive growth strategy) financed

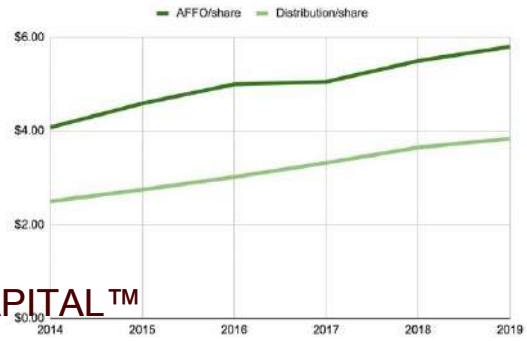
by drawing a lot of capital from its revolving credit facility. The required secured net debt covenant ratio is 4.5x (applicable to the revolving credit facility only). Since LAMR will use most of its operating cash flow for dividends and debt repayment, rising credit risk isn't too concerning. LAMR's flexible business model confers the ability to lower Capex. Also, asset sales of outdoor billboards that typically trade at very high valuations could boost liquidity. Moreover, LAMR has an At-the-Market (ATM) offering program that could be used as another possible liquidity source.

Capital Intensity

5 yr-average of CapEx/Revenue= 6.7% *(avg of* CCO's 8%, LAMR's 7.1%, OUT's 5%)

5-yr average of CapEx/EBITDA= 24.7% *(avg of* CCO: 37.8%*, LAMR: 17%, OUT: 19.2%)*

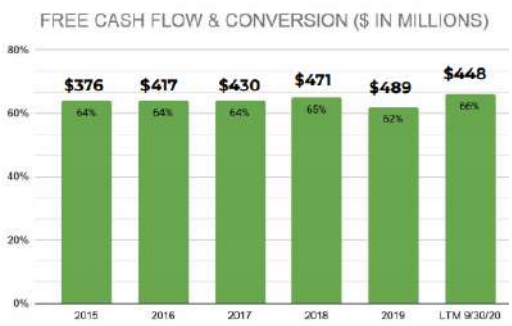
LAMR's lower capital intensity matches my expectations. Although maintenance Capex will be similar across the three players, LAMR spends little growth Capex because it has the most aggressive acquisition strategy that doesn't focus on organic growth.



AFFO per diluted share CAGR is 8% (2013-19), and distribution/shr CAGR is 8.9% (2014-19): As the bar chart shows, LAMR generates consistent FCF and has a disciplined historical FCF conversion related to CAPEX. I expected such a positive trend given LAMR's high fixed costs and how the incremental revenue can be converted into FCF.

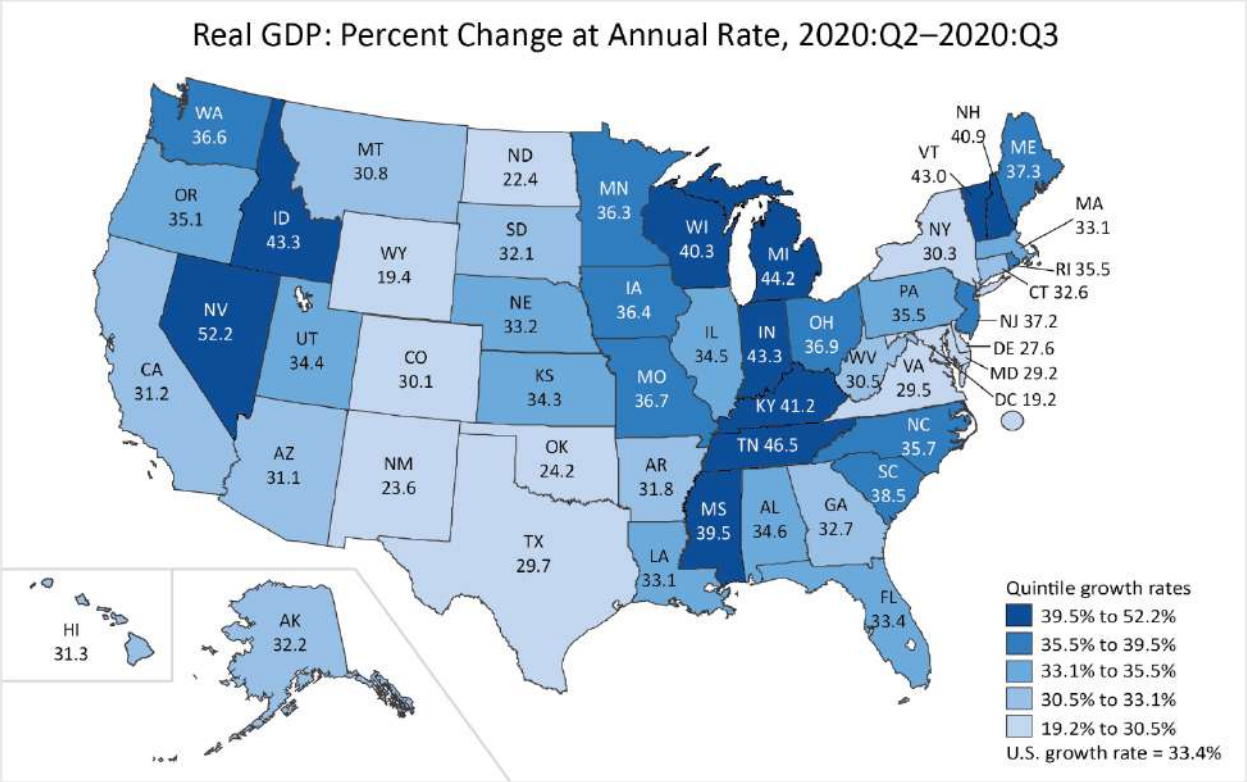
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If an investor used EPS CAGR to assess LAMR's value creation capabilities, he or she would notice that the measure would be -1.4% CAGR from 2015 to '19. This is another evidence that shows why adjusted numbers used in the ratio analysis paints a better picture of LAMR's robust fundamentals.



Investment Thesis

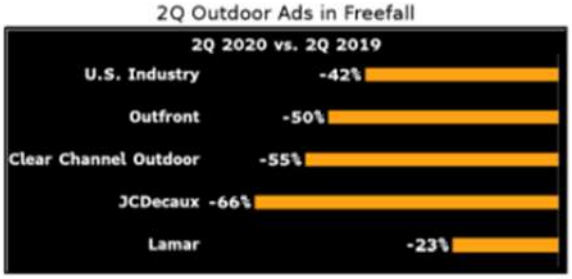
1. LAMR operates the largest network of digital billboards in the US and growing digital platforms to tap into expanding programmatic advertising channel: In the past, ad agencies couldn't accurately assess the effectiveness of their OOH ad campaigns due to the structural limitations of the ad medium. This led to significant market share loss to digital ad platforms



U.S. Bureau of Economic Analysis

(e.g., YouTube, Facebook) that provide various vital metrics and distill big data into actionable insights for the ad buyers. However, a growing number of digital outdoor ads (DOOH) enables ad buyers to quantify KPIs. By mitigating the industry's structural disadvantage, DOOH has increased revenue per unit to as much as 12x of an equivalent static product's revenue per unit.

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2. Least affected by the COVID-related volatilities within the OOH space: As regulations have impeded consumers' travel and overall mobility, we have reduced exposures to outdoor ads. As a result, the consensus is that OOH revenue will plummet by 16% in '20 due to global lockdown measures. However, LAMR has been relatively most resilient during the pandemic than its competitors because the company, unlike its competitors, derives 76% (of 2019) revenue from less volatile local businesses that are relatively less influenced by economic swings. The diversified base of 40k+ total billboard tenants is another factor of LAMR's inelasticity.

LAMR's focus on local spending also helped the company avoid the structural obstacles that its competitors are currently facing: larger metropolitan areas are getting more saturated. It is questionable whether many people who left cities will return. Given that OOH can demand higher prices by the number of eyeballs, risks linger for LAMR's competitors.

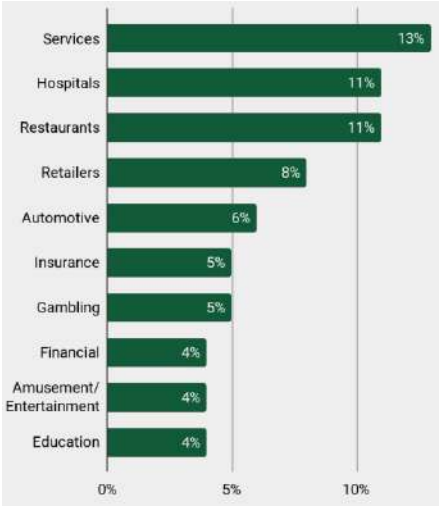
3. REIT-status awards LAMR with tax advantages (avoid double taxation), additional analyst coverage, and access to REIT investors that would otherwise overlook LAMR: LAMR has demonstrated a track record of sustained distribution growth before the COVID downturn. Its payout averaged 4.4%, and LAMR has consistently boosted its annual dividend by ~10% as it utilizes its NOL from prior years. The company's dividend yield compares favorably with an average 4.3% REIT yield.

Although the billboard REIT, classified as a "specialty REIT," hasn't attracted many large and notable REIT investors, LAMR's shareholders still have an option value. Once the market learns more about the niche REIT subcategory, dedicated REIT investors, especially those who are mandated to invest only in REITs, can allocate more capital in OOH and LAMR.

4. Diversified customer base and real-estate portfolio: LAMR has long-standing relationships with many tenants that are blue-chip companies and OOH agencies. The firm's 75-member sales team manages these relationships across nine cities. LAMR also has a sizeable on-the-ground salesforce (747 account executives and 198 sales-support personnel), cultivating and maintaining strong relationships with local decision-makers. This customer-centric approach has led LAMR to generate ten consecutive years of organic growth pre-COVID (one of many reasons why Investors apply premium on LAMR given the sustainable same-store revenue growth may indicate a high degree of customer captivity and high-quality assets).

LAMR owns easements (property beneath) ~10% of its billboard locations, generating 18% of the firm's billboard billing, while 56k+ distinct landowners constitute the rest with no meaningful concentration. Meanwhile, ~30% of LAMR's digital structures are on company-owned property. Diffuse landowner base and regulatory regime help preserve bargaining power and footprint while limiting inflation in lease expense.

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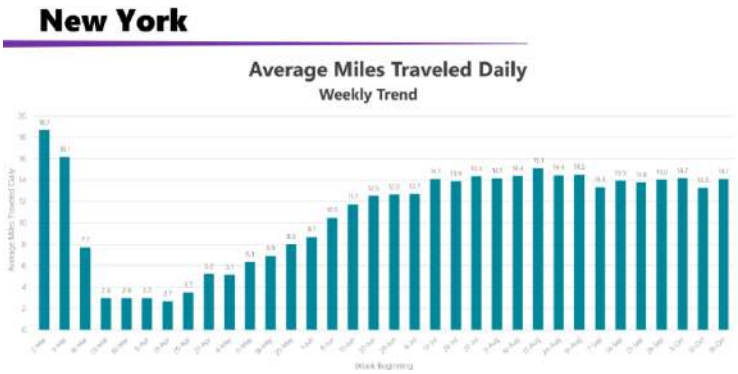


Investment Risks

1. Customer concentration risk: Restaurant, retailers, and movie theaters constitute 44% of LAMR's billboard revenue. The financial damages that are impacted by its high sector exposure are detrimental.

Mitigant: LAMR, however, has no single tenant that accounts for >2% of billboard net ad sales. As a result, the leading billboard operator will not be impacted substantially by idiosyncratic risks (i.e., most important client going bankrupt, etc.).

2. **Possibility of structural decline in traveling:** If people drive less on highways or take fewer flights at airports, LAMR loses pricing power. Magna projects ads tied to street furniture (such as benches) and transit will be hurt the most, falling about 25%, while roadside billboards will fare better, declining about 13%.



Mitigant: The market is divided on the magnitude of lost revenue opportunity. If investors' projection is lower than the street's consensus, they will likely have financial gains with the stock price rally.

3. Cyclical, high beta, and GDP-driven: LAMR has a beta of 1.7, reflecting its vulnerability to the market and economic swings. The marketing expenditure is among the first things that businesses cut during financially difficult times as it's perceived discretion. As a result, the industry grows in line with the GDP growth rate (with 100 basis point spread) and is susceptible to volatile consumer ad spending. Also, LAMR's contract terms (~30 days) are generally shorter than in periods, which implies that LAMR will be impacted more rapidly than in prior economic recessions.

Mitigant: High beta also has positive implications. LAMR's recovery is faster than it took for LAMR to get back on track during the 2008 financial crisis. This is primarily due to higher operating leverage, lower commitment level, and ease of initiating new outdoor campaigns. I also believe the management, who are now more experienced due to having gone through the economic crisis, responds faster and more effectively to the economic deterioration. Moreover, LAMR's lower credit risk than its competitor indicates that its performance will improve quicker than other players.

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Forecasting

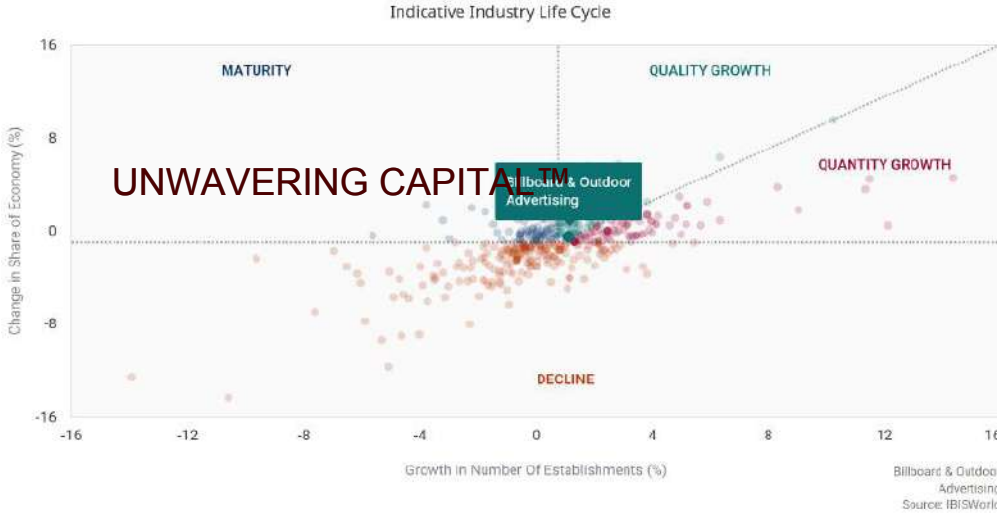
	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Terminal
Assumptions	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**
Sales growth rate	-10.00%	9.50%	9.00%	8.50%	8.00%	7.50%	7.00%	6.50%	6.00%	5.50%	3.50%
Net operating profits after tax/sales	27.00%	28.00%	29.00%	30.00%	31.00%	32.00%	33.00%	34.00%	35.00%	36.00%	37.00%
Beg. Net operating working capital/sales	-10.28%	-1.00%	1.00%	3.00%	5.00%	6.00%	7.00%	8.00%	9.00%	10.00%	11.00%
Beg. Net operating long-term assets / sales	269.11%	220.00%	190.00%	180.00%	170.00%	160.00%	140.00%	120.00%	100.00%	80.00%	60.00%
Forecast Horizon (# years)											
Cost of Capital Parameters											
market risk premium	4.00%										
risk free rate	3.00%										
tax rate	1.89%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%
cost of debt	3.50%	3.00%	2.50%	2.00%	1.50%	1.00%	0.80%	0.60%	0.50%	0.50%	0.50%
cost of debt after tax	3.43%	2.94%	2.45%	1.96%	1.47%	0.98%	0.78%	0.59%	0.49%	0.49%	0.49%
common equity beta	1.00	1.55	1.39	1.24	1.12	0.91	0.75	0.55	0.38	0.34	0.31
Cost of common equity	7.00%	9.21%	8.56%	7.95%	7.50%	6.64%	6.01%	5.19%	4.54%	4.36%	4.25%
Net debt / End. book value of net capital	75.86%	67.00%	58.00%	50.00%	38.00%	29.00%	15.00%	1.00%	-10.00%	-20.00%	-25.00%
Preferred equity / book value of net capital	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Shareholders' equity / book value of net capital	24.14%	33.00%	42.00%	50.00%	62.00%	71.00%	85.00%	99.00%	110.00%	120.00%	125.00%
Implied asset beta	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37
Cost of preferred equity, before tax (if applicabl	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Implied debt beta	0.13	0.00	-0.13	-0.25	-0.38	-0.50	-0.55	-0.60	-0.63	0.00	0.00
Implied preferred equity beta											
WACC (firm cost of capital)	6.86%	8.98%	8.38%	7.81%	7.38%	6.56%	5.96%	5.17%	4.54%	4.37%	4.26%
Beg. Equity Market Value (from Valuation)	69,903.16	74,254.24	80,967.53	87,793.33	94,563.28	101,508.95	107,716.23	113,652.82	118,783.05	123,072.98	127,025.49

Assumptions behind my high revenue growth and multiple expansion



The industry is close to the inflection point and narrative shift: Outdoor ad has historically been simply perceived to be a cost-effective ad channel that's great for brand awareness campaigns given its broad reach. However, DOOH is leveraging data analytics to identify better and target the right customer segment, generating higher ROI on companies' marketing expenditure. Programmatic DOOH has also shown to effectively complement other ad channels in captivating consumers' attention, triggering interests, and converting them to purchases. DOOH's positive impacts beyond increasing awareness (across the marketing funnel) attract many companies implementing direct-response and direct-to-consumer (DTC) approaches. With a higher # of case studies highlighting DOOH's effectiveness and increasing innovative features that further enhance OOH's value proposition, I have a high conviction that LAMR can grow faster than it did historically.

Investor's rising positive sentiment on LAMR's digital transformation will also confer the stock higher multiples.



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Moreover, although the market perceives OOH to be at the mature stage of its life cycle, I believe a more significant number of DOOH products will enable LAMR's growth rate to accelerate on a longer runway for growth. Therefore, my growth rate is higher than the street consensus.

Furthermore, the local market will continue to outperform the national one as many people will continue to work from home in urban areas (in 3Q20, local ads fell 9% while national ads plummeted by 30%). Moreover, businesses and road traffic are returning to normal in middle America.

Assumptions behind my increasing NOPAT margin

I have a positive outlook on LMAR's profitability due to three reasons. First, LMAR will benefit from its high operating leverage. Second, it will consolidate aggressively post-COVID, capturing synergies that would create higher profitability. Due to COVID, many small OOH operators are financially struggling and will be forced to sell their high-quality assets at depressed values. This "once-in-a-lifetime opportunity" presents compelling acquisition targets for LAMR (the most significant player with the strongest balance sheet) to take advantage of the fragmented market.

The table on the right is what I had created to illustrate how realizing cost synergies and operating leverage (both as an outcome of M&A) could lead to margin expansion and higher profit. Please note that these numbers are % of total sales.

Pre-M&A		***Post-M&A***	
Revenue	100	Revenue	100
- Purchases	4.2	- Purchases	3
- Wages	21.7	- Wages	16
- Depreciation	5.3	- Depreciation	5
- Marketing	2.3	- Marketing	2
- Rent	2.9	- Rent	2.9
- Utilties	0.2	- Utilities	0.2
- other costs (G&A)	45.5	- other costs (G&A)	35
EBIT	**17.9**	**EBIT**	**35.9**
EBIT Margin	**17.9%**	**EBIT Margin**	**35.9%**

Purchases: costs tend to vary drastically between operators due to the portfolio of services and products available from each. Some purchase costs include materials for cleaning and repairing billboards, ink and printing materials, lights, and scaffolding. Given LAMR's track record of generating high ROIC and acquiring accretive businesses, its sales will grow faster than the rate at which variable components of purchase expenditure will grow.

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Wages include sales, design, and the compilation of ad materials and mounting, maintaining, and removing ad displays. Wage as a share of revenue will decrease as the revenue growth rate will likely outpace the inflation rate (since wages tend to move in line with inflation). This logically makes sense because when a company acquires another player, it lay-offs many of the target's employees while acquiring more assets that generate higher revenue.

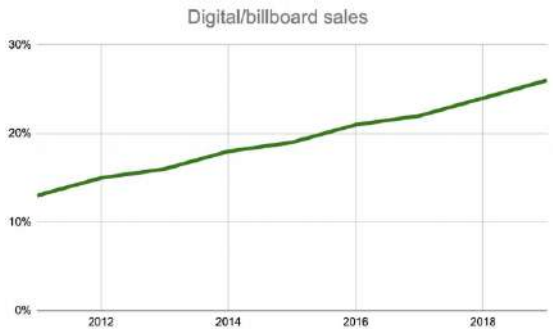
Depreciation: I had its % of total revenue to stay roughly the same to reflect how maintenance Capex will grow in line with revenue. Some leased sites are depreciated on the level of investment made to the structure throughout the lease's life. Also, unpredictable conditions such as weather and vandalism will affect their useful life (typical scale of 5~15 years and need constant maintenance to preserve the quality of inventories). Furthermore, billboards that aren't up to code must be altered or fixed.

Rent expense is highly variable to revenue changes because LAMR owns easements (i.e., property beneath) ~10% of its billboard locations, and LAMR would have to pay more rents for the assets that the target company does not have possession of (which will also be high).

Utilities: Although it only accounts for 0.2% of industry revenue in '20, it's anticipated to rise over the five years to '25 because of the increasing # of digital displays. But the efficiency of LED technology will ensure that utility costs will remain at an acceptable level.

Other costs: This line item consists of transportation expenditure, general admin costs, and other miscellaneous costs. These fixed costs will enable LAMR to have a higher margin as it increases its economy of scale.

The third reason is LAMR's DOOH penetration will likely increase. As of 3Q20, the company has 3,602 digital units, which constitutes 20% of its revenue. On average, LAMR converts 200-225 of its traditional boards to digital displays each year. But the management recently announced on the latest earnings call that LAMR would ramp up its digital-display deployment in 2021 to 300 installations. Since DOOH commands higher pricing power, the company's margin will expand.



Assumptions behind my increasing LT Asset Turnover

LAMR gains more substantial pricing power with higher DOOH penetration. LAMR will generate more revenue with the same easement/asset (remember digital ads are primarily converted from LAMR's analog ads rather than constructing new digital billboards).

Assumptions behind my consistent NWC turnover

Unlike the three ratios where I have adjusted them to reflect improving the market landscape for LAMR (depressed value of acquisition targets and improving pricing power due to higher DOOH penetration, I carried forward 2019's ratio. In an M&A transaction, if at the close, the seller delivers more working capital than the predetermined negotiated rate, the seller will receive a positive adjustment or increase in the purchase price. If the seller delivers less working capital than the target, the seller will owe the negative difference. Since LAMR has acquired numerous OOH operators as part of its strategic initiative, I assumed that the highly experienced management would set a defined target to allow a more fluid negotiation with less friction as buyer and seller can agree to how much working capital should remain a business at the close.

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Assumptions behind 5% terminal growth rate

The annual growth of the real US GDP growth rate from 1990 to 2019 has been averaging ~3%. Yet, many tailwinds for both the industry and LAMR made me apply 5% as my terminal growth rate. First, I am optimistic about the US economy. When the internet was first commercialized in 1995, it enhanced efficiency across industries and initiated many innovations, accelerating the US GDP growth rate (3.8% in 1997 to 4.8% in 1999). Similarly, the current 5G network implementation will unlock tremendous value by advancing emerging technologies, including Industrial 4.0 (AI, IoT, robotics, machine learning, etc.). The technological breakthroughs will lead the economy to exponential growth, and many of the industries, uplifted by improved productivity and competitiveness, have a bigger ad budget. Besides the accelerated economic growth, once the autonomous driving and smart city technologies commercialize at the scale which based on the current development, could happen in ~4 years, drivers and passengers

don't have to focus on the road and instead be more likely to look at what would then be more interactive and personalized DOOH.

Secondly, many initiatives within the industry will change the market's view of OOH. The outdoor operators have been collaborating to pass bills that favor the industry, bring standardization to DOOH data, and help drive programmatic DOOH forward. Ensuring a mutual understanding between the DOOH buyer and seller during the media transaction, these standards will open new inventory discovery opportunities.

Thirdly, LAMR currently operates primarily in the US. After ~10 years of consolidating the market and increasing the penetration rate of DOOH, I think the company will penetrate other countries, which would then be a bigger TAM.

Valuation

Base Scenario (45%)

	$ in thousands, except share and per share data	Low	Base	High
Scenario	Vaccination Rollout (~90% efficacy & 50% coverage of US population)	> Oct 2021	July - Sep 2021	< July 2021
	People Traveling (as % of '19 levels)	50~65%	65~80%	80%+
	US GDP Growth ('21-'22)	< 1.5%	1.5%-3%	3%+
	LAMR's DOOH Penetration Rate ('22)	**< 37%**	**37-45%**	**> 45%**
	Shares Outstanding (in M)		86.4	
Adj. Forecasts	**Revenue CAGR ('19-'22)**	**3.1%**	**5.6%**	**6.1%**
	Terminal Growth Rate ('30)	**3.00%**	**3.50%**	***3.75%***
	NOPAT Margin ('30)	30.0%	37.0%	38.0%
	Beg. Oper. Inv. NWC/Rev ('30)	30.0%	11.0%	13.0%
	Beg. Net Op. LTA/Rev ('30)	100.0%	60.0%	55.0%
	Net Debt / End. BV of Net Capital	-10.0%	-25.0%	-30.0%
Output	Total Rev (2022)	*($0)*	*$1,884*	*$1,980*
	vs. Consensus	*-100.0%*	*9.6%*	*15.2%*
	Target Price ('22)	**$33.67**	**$102.71**	**$158.16**
	Upside/(downside)	***-59%***	***26%***	***94%***
	Probability of Likelihood	25%	40%	35%
	Prob-weighted TP	$8.42	$41.08	$55.36
	Weighted Avg. TP		**$104.86**	
	Upside/(Downside)		*28.8%*	
	Prob. Weighted IRR		13.5%	

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PRO FORMAS & VALUATION											
	Forecast **2020**	Forecast **2021**	Forecast **2022**	Forecast **2023**	Forecast **2024**	Forecast **2025**	Forecast **2026**	Forecast **2027**	Forecast **2028**	Forecast **2029**	Terminal **2030**
PRO FORMAS											
Ending Balance Sheet											
End. Net Working Capital	-17.28	18.84	61.32	110.37	142.38	177.73	216.33	257.97	302.40	344.28	356.33
+ End. Net LT Assets	3,802.08	3,579.14	3,678.97	3,752.55	3,796.70	3,554.66	3,244.90	2,866.33	2,419.18	1,877.89	1,943.61
= Net Operating Assets	3,784.79	3,597.97	3,740.29	3,862.92	3,939.08	3,732.40	3,461.23	3,124.30	2,721.58	2,222.17	2,299.94
Net Debt	2,871.12	2,410.64	2,169.37	1,931.46	1,496.85	1,082.39	519.18	31.24	-272.16	-444.43	-574.99
+ Preferred Stock	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
+ Shareholder's Equity	913.67	1,187.33	1,570.92	1,931.46	2,442.23	2,650.00	2,942.04	3,093.05	2,993.74	2,666.60	2,874.93
= Net Capital	3,784.79	3,597.97	3,740.29	3,862.92	3,939.08	3,732.40	3,461.23	3,124.30	2,721.58	2,222.17	2,299.94
Error											
Income Statement											
Sales	1,578.28	1,728.22	1,883.76	2,043.87	2,207.38	2,372.94	2,539.04	2,704.08	2,866.33	3,023.98	3,129.81
Net operating profits after tax	426.14	483.90	546.29	613.16	684.29	759.34	837.88	919.39	1,003.21	1,088.63	1,158.03
- Net interest expenses after tax	101.43	84.41	59.06	42.52	28.39	14.67	8.49	3.05	0.15	-1.33	-2.18
= Net income	324.70	399.49	487.23	570.64	655.90	744.67	829.40	916.34	1,003.06	1,089.96	1,160.21
- Preferred dividends	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
= Net income to common	324.70	399.49	487.23	570.64	655.90	744.67	829.40	916.34	1,003.06	1,089.96	1,160.21

	Abnormal Earnings Valuation of the Equity	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
	Cost of common equity	7.00%	9.21%	8.56%	7.95%	7.50%	6.64%	6.01%	5.19%	4.54%	4.36%	4.25%
	Net income to common	324.70	399.49	487.23	570.64	655.90	744.67	829.40	916.34	1,003.06	1,089.96	1,160.21
-	Charge for Common Equity	82.62	84.15	101.62	124.90	144.83	162.26	159.27	152.61	140.41	130.61	113.31
=	Residual Operating Income	242.08	315.34	385.61	445.75	511.07	582.41	670.13	763.72	862.65	959.35	1,046.90
	Terminal abnormal earnings											139,704.90
	PV of Residual EBIT	226.24	269.85	303.98	325.50	347.17	370.98	402.66	436.26	471.38	502.30	73,147.46
+	PV of Residual EBIT (years 1-10)	3,656.33										
+	PV of Residual EBIT (beyond year 10)	73,147.46										
=	Beg. Book Value of Equity	1,180.31										
	Value of the Equity	**77,984.09**										
=	Number of shares outstanding (MM)	759.30										
	Estimated value per share	**102.71**										

	Discounted Equity Cash Flow Method	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
	Net operating profits after tax	426.14	483.90	546.29	613.16	684.29	759.34	837.88	919.39	1,003.21	1,088.63	1,158.03
-	Net interest expenses after tax	101.43	84.41	59.06	42.52	28.39	14.67	8.49	3.05	0.15	-1.33	-2.18
=	Net income	324.70	399.49	487.23	570.64	655.90	744.67	829.40	916.34	1,003.06	1,089.96	1,160.21
-	Preferred dividends	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
=	Net income to common	324.70	399.49	487.23	570.64	655.90	744.67	829.40	916.34	1,003.06	1,089.96	1,160.21
-	Investment in Net Working Capital	145.03	36.12	42.48	49.05	32.01	35.36	38.59	41.64	44.43	41.88	12.05
-	Investment in Net Long-Term Assets	-445.27	-222.94	99.84	73.58	44.15	-242.04	-309.76	-378.57	-447.15	-541.29	65.73
+	Increase in debt obligations	-82.81	-460.48	-241.27	-237.91	-434.61	-414.46	-563.21	-487.94	-303.40	-172.28	-130.55
+	increase in preferred equity	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
=	Free Cash Flow to Equity	542.13	125.83	103.64	210.10	145.13	536.90	537.36	765.32	1,102.38	1,417.10	951.88
	Terminal Free Cash Flow to Equity											127,025.49
	Present value of Free Cash Flow to Equity (k_e	506.67	107.68	81.70	153.43	98.59	341.99	322.88	437.18	602.37	741.97	66,508.70
	PV of FCF to Equity (years 1-10)	3,394.46										
+	PV of FCF to Equity (beyond year 10)	66,508.70										
=	**Value of the Equity**	**69,903.16**										
	Number of shares outstanding (MM)	759.30										
=	**Estimated value per share**	**92.06**										

	Discounted Free Cash Flow Method (Firm)	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
	Net operating profits after tax	426.14	483.90	546.29	613.16	684.29	759.34	837.88	919.39	1,003.21	1,088.63	1,158.03
-	Investment in Net Working Capital	145.03	36.12	42.48	49.05	32.01	35.36	38.59	41.64	44.43	41.88	12.05
-	Investment in Net Long-Term Assets	-445.27	-222.94	99.84	73.58	44.15	-242.04	-309.76	-378.57	-447.15	-541.29	65.73
=	Free Cash Flow to Firm	726.38	670.72	403.97	490.53	608.13	966.02	1,109.05	1,256.32	1,405.93	1,588.04	1,080.26
	Terminal Free Cash Flow to Firm (WACC)											141,661.44
	Present value of Free Cash Flow to Firm (WA	679.78	575.98	320.08	360.52	416.25	620.50	672.31	724.17	775.23	838.97	74,840.31
	PV of FCF to Firm (years 1-10)	5,983.80										
+	PV of FCF to Firm (beyond year 10)	74,840.31										
=	**Value of the Firm**	**80,824.12**										
-	**Debt**	**2,953.93**										
-	**Preferred Equity**	**0.00**										
=	**Value of the Equity**	**77,870.19**										
	Number of shares outstanding (MM)	759.30										
=	**Estimated value per share**	**102.56**										

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In the Abnormal Earnings Model, the PV of Residual Operating Income (years 1-10) is $3,754k. It looks reasonable given that LAMR creates higher value above the return shareholders demand on their investment in the company. LAMR was able to generate higher returns than the cost of capital because of its numerous competitive advantages mentioned in the overview and company profile sections.

Moreover, abnormal income's PV of Residual Operating Income (years 1-10) is higher than that of the "equity-only DCF model" and "firm-wide DCF model." This is also reasonable given that, unlike DCF, the residual model factors in a relatively smaller portion of terminal value.

However, in the Abnormal Earnings Model, PV of Residual Operating Income (years 1-10) still only constitutes 5% of the equity value, whereas beyond year ten is $79,54.54. This is highly unreasonable given that the PV of terminal value should be much lower (~55%) based on my knowledge of the company. LAMR isn't a high-growth tech company with a large TAM, and most of its current value is derived from the terminal value. However, I didn't want to massage

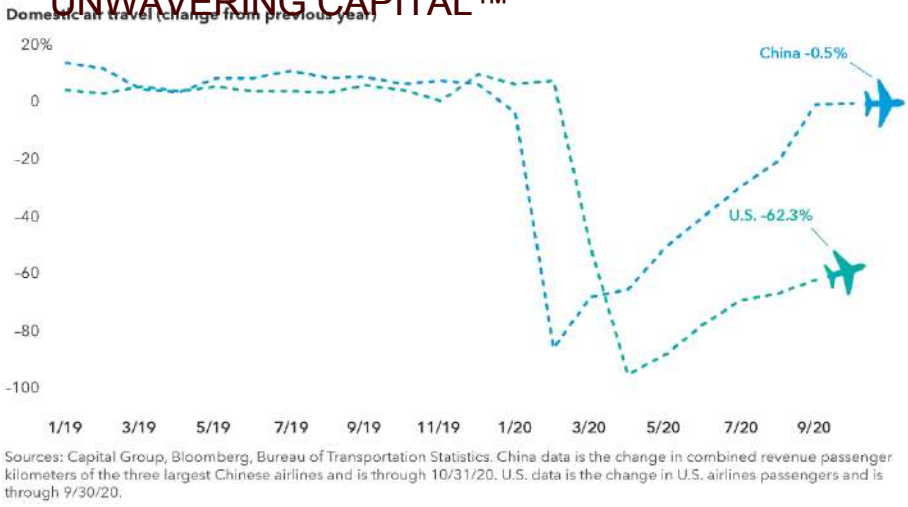
the assumption numbers to lower the terminal value. Because each assumption was derived from my analysis of the ad industry's, OOH, and LAMR's outlook, as discussed in the previous analysis. Besides, as discussed in the previous section, I have a high conviction that the four reasons I applied a high 5% terminal growth rate will likely stay intact.

In some ways, I was expecting irrational results. Although I like using DCF because it is one of few valuation methodologies that tries to capture the intrinsic value, it is susceptible to another measure besides terminal growth rate, WACC, which is sensitive to beta. Since I have a long investment horizon of 3 years for LAMR, I don't view price volatility as risk, which is what beta is essentially trying to capture according to the CAPM model. Thus, I have simply put beta to be 1 and let WACC be the same across all three scenarios to mitigate that be the factor that drives the stock price. Also, since DOOH will change the unit economics and attract more ad allocation, which would transform OOH players, I don't think the DCF nor applying multiple based on the historical average to value LAMR isn't the best valuation methodologies. Instead, I would have used precedent transactions and the average of specialty REITs' AFFO multiple to value LAMR. Even though most OOH deals are private and the terms aren't closed, I have done a quick analysis and discovered that private OOH operators could be bought at 8~10 CFx or 4-6 Salesx (the average multiple for US media companies is 8~10 EBITDAx.

			in US$M				
Acquirer	**Target**	**Date**	**Ent. Value**	**EBITDA**	**EV/EBITDA**	**Type**	**Notes**
Ever Harmonic Global	CCO	March-20	$498	$75	6.6x	Cash (tender offer)	The offer price represents 50.2% premium to the closing price
OUT	Van Wager Communications	July-14	--	--	10.8x	--	Van Wagner has ads in NY's Times Square and buses on the Las Vegas strip

The base scenario was under the assumption that Industries, especially restaurants, retailers, and movie theaters, will recover but not to their 2019 levels. This is under the backdrop in which US economic growth will be 2-4% in 2021-2022. I have set the probability of this happening to be 40% while applying the high scenario to be 35% and the low scenario to be 25%. I have assigned the high probabilities for both high and low scenarios to reflect the inherent difficulty in forecasting GDP growth given numerous moving parts and the possible binary outcomes. That said, I assigned a higher possibility for the bull scenario to show my optimistic outlook of the US economy, given the recent bullish investor sentiment and fiscal/monetary stimulus packages.

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Sources: Capital Group, Bloomberg, Bureau of Transportation Statistics. China data is the change in combined revenue passenger kilometers of the three largest Chinese airlines and is through 10/31/20. U.S. data is the change in U.S. airlines passengers and is through 9/30/20.

Costco Wholesale Corp(NASDAQ: COST) **Ishan Majumdar, Sean Lee**
Industry: Consumer Staples
Current Price/Target Price: $297/$330 (12 months)

Recommendation

We recommend a long position in Costco Wholesale Corporation (COST) with a target price of $330 per share over a 12-month time horizon. This target price provides an 11.3% return at a $296.97 per share entry price. COST is a leader in addressing income inequality in the consumer staples industry. COST offers fair wages and top-notch benefits that far exceed the federal minimum standards, and has created a workplace culture that attracts positive, high-energy, talented employees.

Investment Overview

We view COST as the best positioned player within the consumer staples industry. Consumer staples, as a sector, is not volatile and is defensive in nature, and we do not foresee a large impact from an economic downturn or boom. During the last recession, large players in the space saw limited declines (<1%) in revenue with almost no negative effects on gross margins.

COST offers an unparalleled value proposition to its loyal customer base (~91% renewal rate, despite a fee increase), which is a significant driver of its bottom line. COST's management is deliberate and thorough, and this slow and steady approach is crucial when evaluating opportunities in global growth and expanding online offerings. Because of these factors along with a built-in resistance to economic downturns and a possibility of a special dividend (~$7.7B in net cash in FY19), we believe this is a good time to own COST.

Stock Performance Highlights	
Stock Price 52-week Range	296.60
Stock Price Close (10/31/19)	297.11
Market Cap	130,348.8
Shares Outstanding	439.6
EPS	8.3
P/E Ratio (TTM)	35.97x
EV/EBITDA	20.5x
Dividend Yield	0.87%
Beta (3Y Monthly)	0.93

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Company Performance Highlights	
ROA	6.87%
ROE	26.80%
ROIC	17.10%
Operating Margin	3.20%
Net Profit Margin	2.50%
Current Ratio	1.01
Total Asset Turnover	3.29

Business Overview

COST operates 782 membership warehouses in the US, Puerto Rico, Canada, the UK, Korea, Taiwan, Japan, Mexico, Spain and Australia. The company prides itself on offering a low maintenance shopping experience with reliably low prices on a limited selection of nationally branded and private-label products (~3,800 SKUs) across a wide range of merchandise categories, including foods, sundries, hardlines, fresh foods, softlines, and ancillary (gas stations and pharmacy). A typical warehouse format is approximately 144,000 square feet on average with newer units being slightly larger. COST is headquartered in Issaquah, WA.

Apart from operating warehouses, COST generates revenues through membership fees. COST offers two basic types of memberships: Gold Star and Business. The cost of these two memberships is the same, at $60 per year. Gold star memberships are available to individuals, and who have the option to upgrade to a premium-tier executive membership for an additional $60 per year. Business memberships are limited to businesses, and business members have the option to add on additional card holders.

Costco Wholesale Corp(NASDAQ: COST) **Ishan Majumdar, Sean Lee**
Industry: Consumer Staples
Current Price/Target Price: $297/$330 (12 months)

Investment Thesis

- **Global Growth Opportunity:** With only 139 locations outside of US/Canada (~18% of total), COST plans to grow their international presence at 3% annually, in addition to adding 10-20 stores in the US/Canada. Both Costco Canada and Costco Other International grew same-store sales at nearly ~5% year-over-year. Additionally, the first warehouse in China has seen record sign-ups of more than 200,000 members vs. the average club of 68,000 members. COST plans to take a slow and steady approach to growth in China with the second warehouse opening in Shanghai in early 2021. Historically, COST has opened one to two warehouses in the first couple of years and a couple more in the following one to two years before scaling up. Deliberate expansion provides COST with decades of international growth.

- **E-commerce Growth Opportunity:** COST has weathered Amazon's assault on retailers, and currently, e-commerce makes up 6% (~$9.2B) of total sales. E-commerce sales were up 21.9% year-over-year with strong growth in electronics and grocery. COST expanded its online SKUs catalog to ~8,000. As with global growth, COST will take a deliberate and planned approach to expanding its catalog, which has led to investors underappreciating COST's ability to provide more for its members. As COST gains access to more national brands and consumers become more aware of COST's private brand (Kirkland Signature), gains in share of wallet remain vast. Additionally, COST plans on extending its international E-commerce operations from Canada, Mexico, and the U.K. to Japan and Australia.

- **Income Equality:** COST differentiates itself from its competitors by providing a much higher standard of living for its employees. COST recognizes that employees that feel taken care of are much happier, which in turn leads to higher morale and better customer service. These factors lead to higher customer renewal rates and lower employee turnover rate which is crucial factor in COST's stable and growing sales and more predictable free cash flow growth.

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- **Low Cost Operating Model:** COST processes are made efficient at every point, which, in turn, helps the company to maintain margins despite low-price positioning. The company offers only a limited selection of national brands and private labels across a wide merchandise range which allows COST to have control over its suppliers. COST encourages volume purchasing by having low prices and therefore, the sales volume is kept high and inventory turnover is very rapid, reducing costs. The high turnover allows COST to generate revenue before paying suppliers, lowering financing costs. COST grew sales in their private label brand from $35B to $39B (~30% of total sales), which has driven margin. COST's operating model has been a key driver of same stores sales growth compared to its competitors as seen in the chart below. This growth leads to COST increasing their market share in the space.

Same Store Sales Growth	FY2016	FY2017	FY2018	FY2019
COST	0.02%	4.10%	9.60%	6.10%
WMT	1.20%	1.40%	2.10%	3.60%
Sam's Club	*1.10%*	*2.00%*	*3.80%*	*0.09%*
TGT	-0.05%	1.30%	5.00%	3.70%
KR	0.70%	0.90%	1.80%	2.60%
BJ's Wholesale	-2.60%	0.80%	3.70%	1.60%

Source: Company Filings

- **Potential Special Dividend Amount:** COST's ~$7.7B in net cash (less debt coming due) provides an opportunity to pay out a special dividend over the next twelve months. While Costco's special dividends have occurred about every two to three years, the company has been busy raising its regular dividend as well. In the last five years, Costco raised its regular dividend by an annual rate of between 11% and 14%. COST has declared three special dividends of $7, $5, and $7 in 2012, 2015, and 2017, respectively. Averaging the payout ratio in those instances, COST could pay a special dividend of ~$7/share from the cash and short-term investments available end of FY19.

Valuation

Given the low margins within consumer staples, discounted cash flow is the most appropriate valuation methodology. The DCF model identifies and uses the key value drivers of net operating profit less adjusted taxes (NOPAT) and capital expenditures to calculate the future cash flows (FCF) for the next 10 years. For our models, we assumed a terminal growth value of 3.25% given the defensive nature of the industry. Within the model, we assume modest single-digit revenue growth in line with the past couple of years and the appropriate capital expenditures to fund this growth based on recent capital efficiency levels. We also assume that EBITDA is a steady 4.2%-4.5% of revenue based on historical data. Three scenarios are computed based on varying costs of capital, ranging from 6.17% to 6.67%, in line with COST's cost of capital. An average of these values is taken to produce a fair value of $336.42. This value translates to ~20x on an EV/EBITDA basis, which is in line with historical valuations.

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Model Summary

	Range			Conclusion	Fair Value
	Low	Medium	High		
					330
Cost of Capital	6.67%	6.42%	6.17%		USD
Perpetuity Growth Rate	3.00%	3.25%	3.50%		
Fair Value (USD)	284	325	381	330	
Upside/Downside	-4.2%	9.6%	28.5%	11.3%	

	10-Yr Period
Revenue 10Y CAGR	5.8%
EBITDA 10Y CAGR	7.3%
Unlevered FCF 10Y CAGR	11.5%
10Y Average EBITDA Margin	4.4%
10Y Average Unlevered FCF Margin	1.9%
Ticker	**COST**

Costco Wholesale Corp(NASDAQ: COST) **Ishan Majumdar, Sean Lee**
Industry: Consumer Staples
Current Price/Target Price: $297/$330 (12 months)

Revenue and EBITDA Forecast

(USD in millions)		Input Projections									
Fiscal Years Ending	Sep-19	Sep-20	Sep-21	Sep-22	Sep-23	Sep-24	Sep-25	Sep-26	Sep-27	Sep-28	Sep-29
Revenue	152,703	164,461	176,862	189,489	202,072	214,479	226,575	238,221	249,275	259,595	269,044
Net sales	*149,351*	*149,351*	*149,351*	*149,351*	*149,351*	*149,351*	*149,351*	*149,351*	*149,351*	*149,351*	*149,351*
Membership fees	*3,352*	*3,352*	*3,352*	*3,352*	*3,352*	*3,352*	*3,352*	*3,352*	*3,352*	*3,352*	*3,352*
% Growth	*7.9%*	*7.7%*	*7.5%*	*7.1%*	*6.6%*	*6.1%*	*5.6%*	*5.1%*	*4.6%*	*4.1%*	*3.6%*
EBITDA	6,229	6,973	7,499	8,034	8,770	9,437	9,969	10,720	11,217	11,682	12,645
% of Revenue	*4.1%*	*4.2%*	*4.2%*	*4.2%*	*4.3%*	*4.4%*	*4.4%*	*4.5%*	*4.5%*	*4.5%*	*4.7%*

Current Trading Multiples

	EV / LTM EBITDA			
	Min	Max	Average	Median
Costco Wholesale Corporation				21.0x
Benchmarks	7.7x	27.6x	14.4x	12.7x
Historical Median	12.3x	20.6x	16.3x	15.8x

Benchmarks Used	Ticker	Multiple
Target Corp	NYSE:TGT	10.1x
Wal-Mart Inc.	NYSE:WMT	12.7x
Kroger Co.	NYSE:KR	7.7x
Amazon	NASDAQGS:AMZN	27.6x
The Home Depot	NYSE:HD	16.0x
BJ Wholesale Club	NYSE:BJ	12.5x
Lowe's	NYSE:LOW	14.4x

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Sensitivity

EV / EBITDA Multiple	18.0x	19.0x	20.0x	21.0x
Price ($USD)	312	329	346	363

Assumptions

- **Revenue Decomposition:** When analyzing COST's revenue decomposition, we predict revenue to grow at 7.7% in 2020 and 7.5% in 2021 before it starts to decline by ~0.5% annually until 2029. The higher initial growth rates are driven by COST's international expansion and that COST has been able to grow same stores sales faster than its main competition.

- **EBITDA Margin:** We predict EBITDA/Revenue to remain steady at ~4.2% for 3 years and then steadily increase to ~4.7% by 2029. Different margins, different products and more efficient technology being integrated with new store developments will increase sales and decrease costs. With the increase in stores, we predict the average sales per store would increase while Costco conducts a strict analysis of the land to minimize cannibalism and maximize sales.

- **CAPEX Margin:** We predict capital expenditures to remain at 2.0% of revenues for 5 years. This is driven by COST's global expansion and e-commerce, and simultaneous slowdown of physical US expansion. After 5 years, capex slowly declines to 1.7% of revenue.

- **Terminal Growth Rate:** We used a terminal growth rate of 3.25% based on long-term real GDP growth. A sensitivity of +/- 25bps in the rate was used to determine a low/high price of COST.

- **WACC:** COST's weighted-average cost of capital was determined using their cost of equity and their cost of debt. The cost of equity was determined using the 10Y US treasury bond yield, Damodaran's Equity Risk Premium (as of 10/1/2019), and COST's beta of 0.93. The cost of debt was determined using COST's rating of AA and then finding the spread of AA bonds over the 10Y US treasury yield. For the weightings, the gross debt was used for COST as the net debt is negative. The tax rate used is 26%, which is in line with historical rates. This gave a final cost of capital of 6.42%. A sensitivity of +/- 25bps in the rate was used to determine a low/high price of COST.

WACC	
Risk-Free Rate (10Y US Treasury)	1.84%
Damodaran Equity Risk Premium	5.20%
Costco Equity Beta	0.93
Cost of Equity	6.68%
ICE BofAML US Corporate AA Option-Adjusted Spread	0.58%
COST Interest Coverage Ratio	31.8x
Tax-Rate	26%
Cost of Debt	1.79%
Costco Value of Equity (in $MMs)	130,349
Costco Total Debt (in $MMs)	7,244
Costco Total Cash (in $MMs)	9,444
Costco Total Net Debt (in $MMs)	-2,200
Using Gross Debt	
WACC	6.42%

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Risks

- **Overexposure to US and Canadian Markets:** COST is highly dependent on the US and Canada for revenue generation. Within the US, COST is highly dependent on its California operations, which represented 30% of the US net sales in 2019. Any decline in sales in the US (particularly in California) and Canada due to weakening demand trends, increase in unemployment rates, and other factors could significantly affect sales.

- **Intense Competition:** COST operates in a highly competitive industry, where players primarily compete on price, merchandise quality and selection, location and customer service. The evolution of retailing in online and mobile channels has improved customers' ability to compare similar products with different digital devices, further intensifying competition. Thus, such intense competition could have a negative impact on Costco's market share.

- **Deterioration in Membership Renewals:** Declines in renewal rates and/or new memberships would impact earnings potentials

ESG Impacts

Income (In)equality

COST is and has been a leader in addressing income inequality within its company in the consumer staples industry.

Living Wage and Benefits

COST's starting minimum wage for all employees is $15/hour, with higher wages in certain markets. COST has consistently been well above the federal minimum wage for the past 10 years, unlike competitors who have only recently started increasing wages in response to public demand. Higher level management at COST monitors how and when certain competitors (TGT, $13/hour starting wage and WMT $11/hour) increase wages, and they plan ways for COST to react. The median employee (including seasonal and temporary) at COST makes >70% than median employees at competitors. COST also provides extensive healthcare (coverage includes medical, vision, dental, prescription drug, and mental health) and retirement benefits (401k contribution even if employees do not contribute), which rivals are reluctant to provide. In March 2019, COST introduced paid bonding leave to hourly employees.

Gender Equality

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Men and women who perform substantially similar work at COST are paid within 99.9% of each other after adjusting for key factors such as job, company seniority and hours worked. COST examines each component of compensation including base pay, bonus and equity and if observed in the future, COST would work to correct unexplained gender-based differences. COST has recognized that they have a lack of women in executive and higher management roles and are working on a plan to address this issue.

Low Employee Turnover

COST prides itself on having a culture that enables its employees to grow and advance quickly through the company. In addition to having a high starting wage, employees are provided with a wage progression ladder at the start of employment and increases in pay come relatively quickly ($1^{st}/2^{nd}$ increases are at 1040/2080 hours worked). After 10 years of service, employees are making well over $50k in annual pay. Although the 12-month turnover is 12% (mainly due to high school and college students), the overall turnover is 6-7%. The average employee at COST has worked there for 16-18 years. Involuntary leave is less than 2% (mostly from shrinkage). In the U.S., COST's employees have, on average, almost nine years of service with the company. Over 60% of U.S. employees have five or more years, and over one-third have more than 10 years.

COST also makes sure its staff is well trained to handle many situations. Employees are cross trained on the job to be versatile enough to work different parts of the store. This training is ingrained in COST's culture. A former CEO said: "If a manager isn't spending 80-90% teaching, then that manager is doing it

wrong." (Direct quote from IR). COST fills 95% of its higher-level positions from current or former employees.

CEO Pay Ratio

COST's CEO pay ratio to median employee is much lower than almost all its competitors. COST's ratio of 191:1 is an industry low for two main reasons: higher median wages than all direct competitors and lower CEO pay. As noted above, COST's median employee makes >70% more than comparable employees. CEO pay is reviewed annually by the board and shareholders and is well below rival company's CEOs. Additionally, COST provides a supplemental ratio which considers only full-time employees. The median full-time employee has a pay of $49,288 resulting in a pay ratio of 150:1.

Ticker	Company	Median Worker Pay	Pay Ratio
COST	**Costco**	$38,810	191:1
WMT	**Wal-mart**	$21,952	1076:1
TGT	**Target**	$22,439	767:1
HD	**The Home Depot**	$23,389	486:1
KR	**Kroger**	$24,912	483:1
AMZN	**Amazon**	$28,836	58:1

Source: aflcio.org

Community Involvement

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COST is heavily involved, both on a firm and employee level, within their local communities. COST budgets 1% of pretax profits for charitable contributions focused on children, education, and human services (e.g. United Way, Children's Miracle Network Hospitals). In 2018, COST made $40MM in cash donations. Additionally, COST donates products, such as prescription eyewear and food, to partner organizations. In 2018, COST donated 260,000 pairs of glasses and over 34 million pounds of food. COST also encourages their employees to volunteer in their communities and provides them with up to 5 days of paid time-off for volunteering.

Controversies, Litigation, and Responses

Since 2009, COST has experienced similar labor law violations as a few of its major competitors (TGT and KR), and it is vastly below WMT's violations. Much of the difference in the number of violations between COST and KR are driven by where the companies are located (COST has concentration in states with more employee friendly labor laws). Nevertheless, COST is quick to react to other controversies, such as product recall. COST has a large buying staff to vet and subsequently monitor their products. In the past, they have dropped high selling products due to violations, such as human rights or animal cruelty. Their membership model allows them to contact consumers who have bought such products to provide them with recall and refund information.

Costco Wholesale Corp(NASDAQ: COST) **Ishan Majumdar, Sean Lee**
Industry: Consumer Staples
Current Price/Target Price: $297/$330 (12 months)

Ticker	Company	Labor Law Violation since 2009 ($)
COST	Costco	$13,102,895
WMT	Wal-mart	$741,387,677
TGT	Target	$12,529,517
HD	The Home Depot	$30,916,348
KR	Kroger	$1,584,932
AMZN	Amazon	$562,124

Source: Goodjobsfirst.org/violation-tracker

Supply-Chain Involvement

COST's suppliers and their facilities are subject to a "Supplier Code of Conduct", which is global in its scope. The code is derived from policies and standards put forward by the UN and the ILO (e.g. prohibits slave/illegal prison labor, human trafficking, and child labor). To make sure that standards are not violated, COST conducts numerous in-person audits and hires 3rd party auditors, based upon risk and prior audit results. As of 2018, COST is a member of the Responsible Labor Initiative (RLI), which primarily focuses on promoting the rights of workers vulnerable to forced labor globally. COST continues to focus on leveraging industry-based efforts to drive significant impact on the ground where our products are sourced.

COST has the unique opportunity to have better control over their supply chain for their Kirkland Signature products. COST's buyers work with our suppliers to continually improve the quality of Kirkland Signature products, expand traceability, provide a fair return to people in the supply chain, and facilitate access to global or regional markets.

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Broader ESG

Environment

COST agrees that global climate change is serious environmental, economic, and social challenge. COST studies many parts of their business where they can lessen their impact on the planet. COST continually works to enhance and streamline its compliance with environmental regulations, including an Environmental Compliance Executive Team, that together with regional compliance managers and field auditors, oversees compliance programs in the U.S. All of COST's warehouses are consistent with LEED requirements and 15% of their stores are fitted with solar photovoltaic systems. Another goal of COST is to help provide a net positive impact for communities in commodity-producing landscapes, by reducing the loss of natural forests and other natural ecosystems.

COST has also reviewed their products to understand how to be more sustainable. A goal is for all plastic to be recyclable PET or made from recycled plastic and there is an increased focus on labeling so that members understand how to better recycle products. COST is eliminating all polystyrene from inner packing materials.

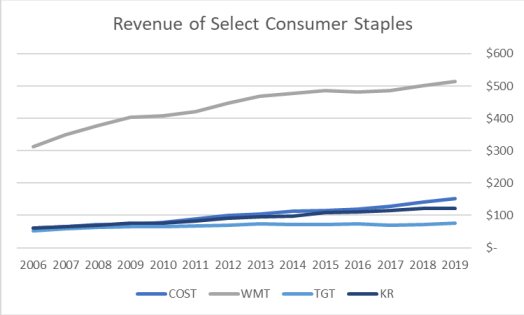
Governance

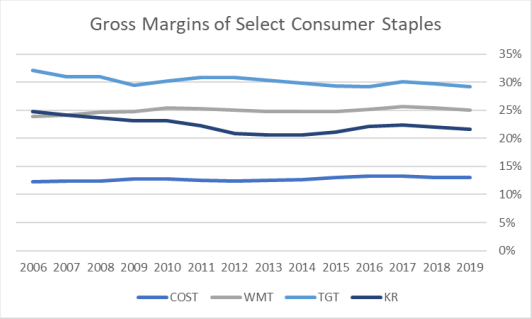
COST recently voted to move from a classified board to electing a full board annually. COST has recognized the lack of diversity on the board and identified this issue as an area for improvement. COST

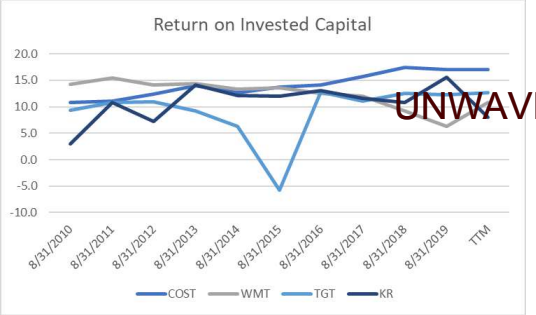
also voted to lower the threshold from supermajority (67%) to majority (50%) for amendments and proposals.

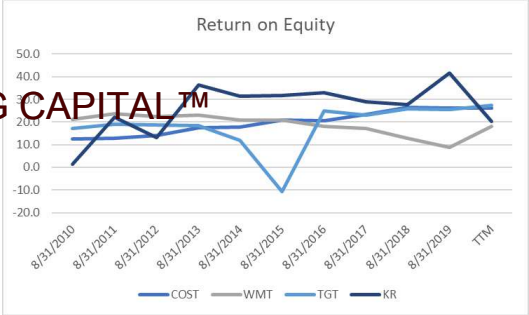
COST has also started setting up a small team to create investor presentations describing their ESG activities and where they have opportunities to improve, but have not done so in the past given their limited SG&A.

APPENDIX









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Capital Expenditures Forecast

(USD in millions)		Input Projections										
Fiscal Years Ending	Sep-19	Sep-20	Sep-21	Sep-22	Sep-23	Sep-24	Sep-25	Sep-26	Sep-27	Sep-28	Sep-29	Terminal
Capital Expenditures	2,998	3,289	3,537	3,790	4,041	4,290	4,305	4,526	4,487	4,673	4,574	4,574
% of Revenue	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	1.9%	1.9%	1.8%	1.8%	1.7%	1.7%

	Fiscal Years Ending					YTD
Historical Spending	Sep-15	Sep-16	Sep-17	Sep-18	Sep-19	Sep-19
Capital Expenditures	2,393	2,649	2,502	2,969	2,998	2,998
% of Revenue	*2.1%*	*2.2%*	*1.9%*	*2.1%*	*2.0%*	
5-Year Average	*2.1%*					

$573B SEMICONDUCTOR TAM EST. TO GROW 12% CAGR BY 2029

Since 2011, margins expanded (GM 6%, EBITDA 8%, FCF 6%) and sales grew 7% - but the magnitude of multiple compression through downturns has grown over time

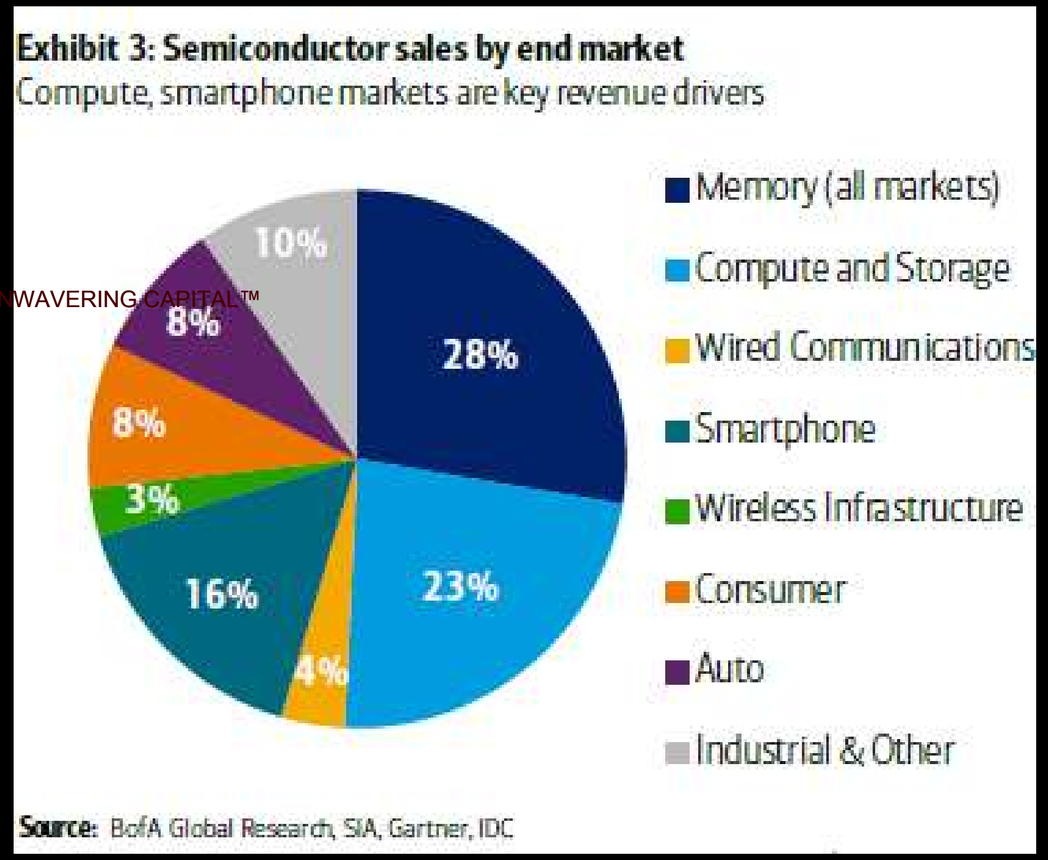
What's Changed?	What's the Impact?
More demand from non-consumer end markets	• Longer, **stickier design cycles** • **Less cyclical**, more sustainable growth • **Stable pricing & better margins**
Fewer players (consolidation)	• **Higher barriers** to entry • **More disciplined** (supply and inv. mgmt.) • **Less cyclical**, more profitable
Slowing Moore's Law (harder to make next-gen chips)	• Rising cost & complexity = **higher barriers to entry** • Slower, **less volatile supply growth** = less cyclical
New wave of compute (AI, IoT, 5G, etc.)	• **Increases strategic importance of chips** in the broader economy • Large, **growing incremental TAMs** • Both **unit and content growth**

Source: BofA Global Research

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Exhibit 3: Semiconductor sales by end market

Compute, smartphone markets are key revenue drivers



Source: BofA Global Research, SIA, Gartner, IDC

SAMSUNG

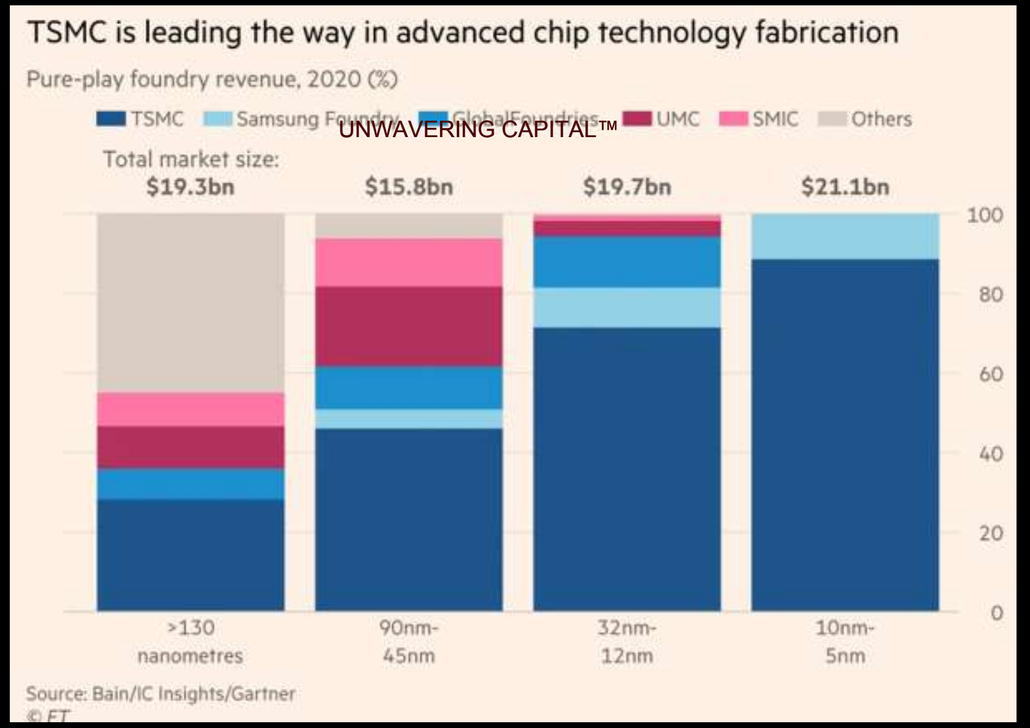
$100B FOUNDRY MARKET EST. TO GROW 8% CAGR THROUGH 2028

TSMC reported having a 92% share of advanced semis (vs. SEC's 8%) and SEC has been undercutting

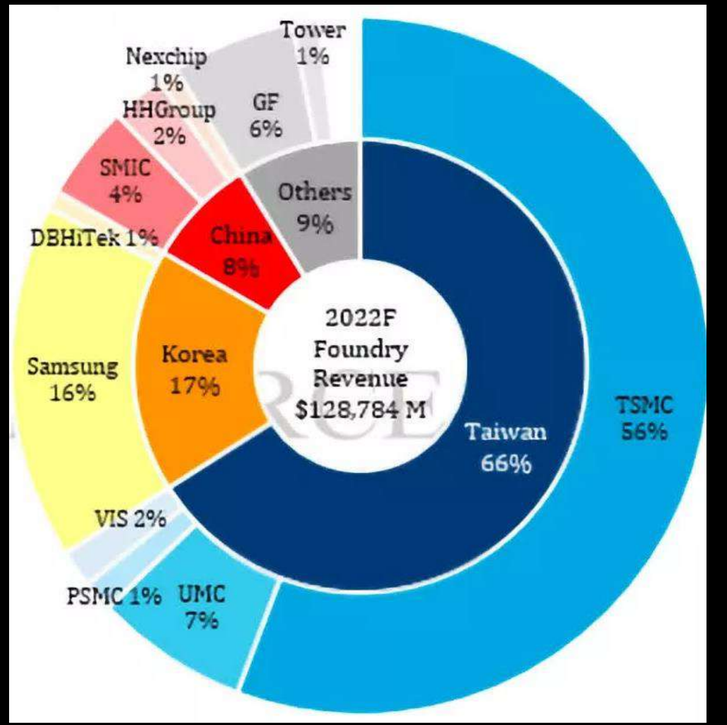
Buyer	Target	Deal Type	Deal Size ($B)	Date	Rev	EBITDA	Target Industry	Target Subsector	Target Tech	Target Customers	Rationale
Intel	*Tower Semi (Israel)*	*M&A*	*$5.4*	*2/15/2022*	*3.8x*	*13.4x*	*Logic & Memory Foundry (>90nm)*	*Lagging edge node*	*5% share in 200mm wafers (vs. China's Hua Hong 11%, (partially state-owned) SMIC's 10%). Thus subject to China's approval*	*300 (consumer, auto, medical, industrial, defense)*	*Complete service portfolio. Tansition to more profitable nodes are feasible*
SK Hynix	Key Foundry (Magnachip's spinoff)	M&A	$0.5	10/9/2021	1.6x	--	Memory Foundry	200mm wafer (still short supply)	manufacturing capacity of 80~90k wafers/mth		Diversify away from memory to foray into top 10 global foundry

SEC'S 5% foundry share comes from its internal logic IC business (System LSI)

- Jointly developing 3nm chips with 5-6 fabless clients, for scale by 2024 - Nvidia GPU, IBM CPU, Baidu AI server, Qualcomm AP/SoC (SEC now has 60% share in leading node - 3/4/5nm - mobile chipset vs. TSMC's 40% which is critical development given that smartphone constitutes 48% of TSMC's revenue)



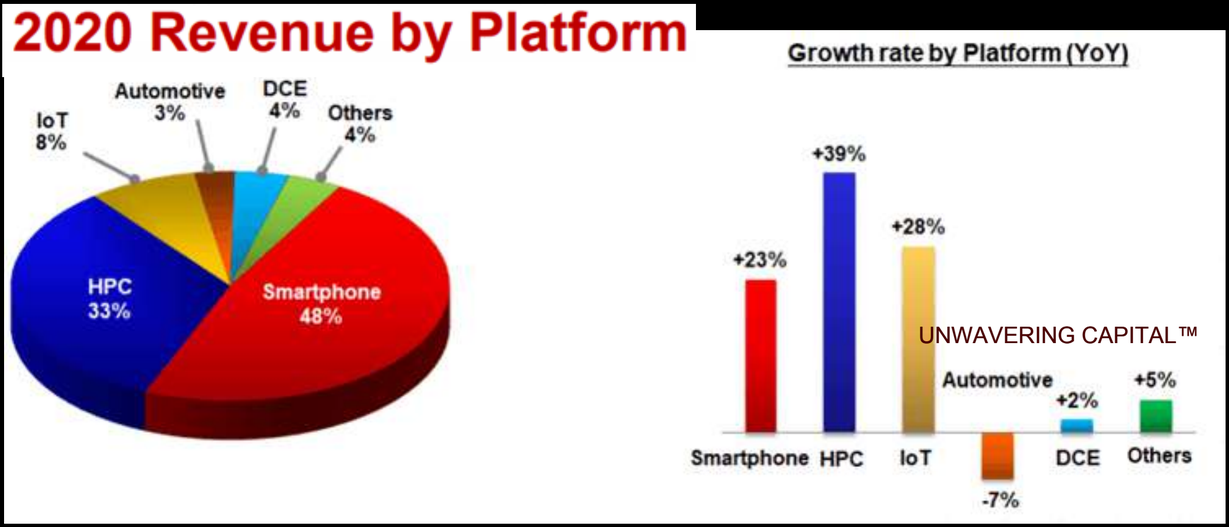
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TSMC'S FINANCIALS SIGNAL DURABLE COMPETITIVE ADVANTAGES EXIST IN ADVANCED FOUNDRY

TSMC's sustained 57% GM (pricing power), 27% ROIC and 54% mkt share suggest that advanced-node foundry is profitable – I can also deduce SEC shares similar economics (though likely weaker) and, therefore, applaud its focus on logic foundry



TSMC generates 26% of its revenue ($12B) from Apple (accounted for 85% of SEC's foundry sales in 2012 with A5 SoC)

- SEC bought 3% stake in Sharp for $110M in 2013 as Apple took screen orders from SEC to Sharp
- SEC won an MCU foundry order from Switzerland-based STMicroelectronics for use in iPhones (TSMC controls 70% of MCU foundry)

Question for SSIC

- **What analysis gave Samsung the conviction to foray into mobile?** Although mobile is now a $100B business for SEC (vs. $80B semi), SEC lost a $100B+ component supply business with Apple ($10B ARR in 2012 with likely high ARR growth rate) and 6+ years partnership (supply of both NAND/DRAM fell to <10%, LCD, SoC chip orders) to TSMC. Indeed, Apple and TSMC started talking in 2010 (Morris Chang rejected Apple's investment and foundry request), and Apple bought P.A. Semi (chip designer) in 2008 for $278M. But what frameworks enabled framing risk/reward of such a drastic strategic shift?

THUS, I APPLAUD SEC'S FOCUS ON FOUNDRY ESPECIALLY GIVEN CURRENT MARKET DYNAMICS

Despite TSMC's superior independent foundry business model, SEC has more diversified customers that need dual sourcing, robust node migration commitment (3nm GAA, 2nm/1.4nm) and advanced packaging using proven-in-house memory

Characteristics that confer Foundry market with a high barrier to entry

- Fab takes 2 years and $15B (2/3 on equipment & 1/3 on building/land) to build, and requires 3k engineers to operate and ~90% capacity utility to break-even
- SMIC can't access EUV with US-led sanctions, UMC/GF lack the scale to compete in advanced node - foundry will be a duopoly with a wide moat
- Revenue is arguably more predictable: guided Capex is a leading indicator of future sales - 2.9x CapEx)
- TSMC (#1) and SEC (#10) in U.S. Patent allowance rate, signaling high quality patent portfolio

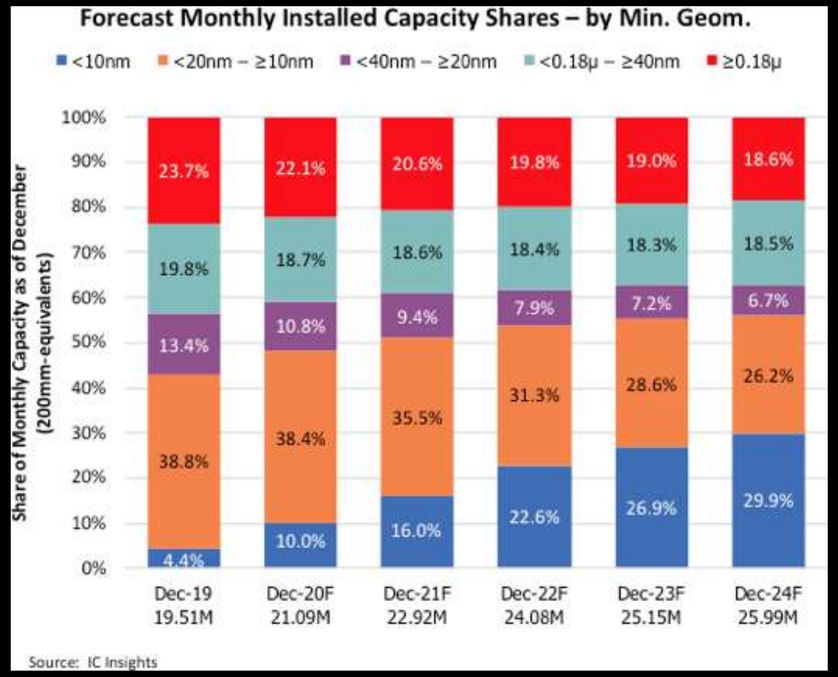
TSMC Customer Share of Revenues in 2019 - 2021

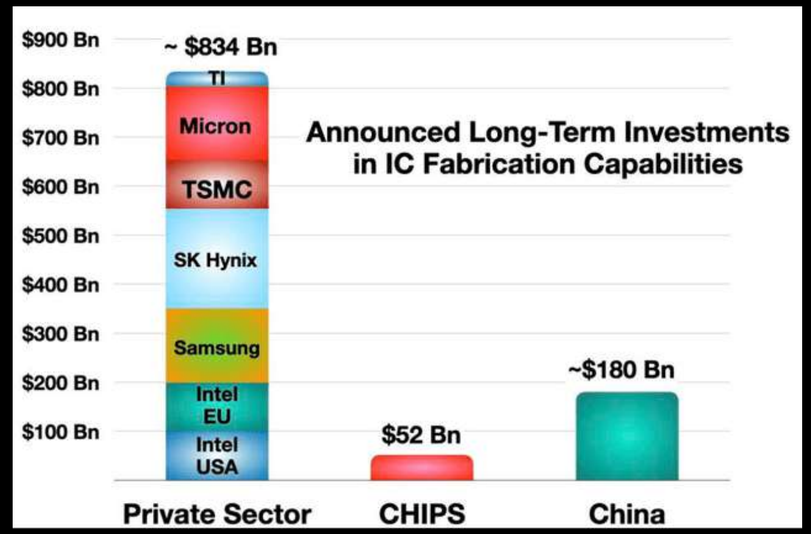
	2019	2020	2021
Apple	24%	24.2%	25.4%
HSilicon	15%	12.8%	0%
Qualcomm	6.1%	9.8%	7.6%
Nvidia	7.6	7.7%	5.8%
Broadcom	7.7%	7.6	8.1%
AMD	4%	7.3%	9.2%
Intel	5.2%	6%	7.2%
Mediatek	4.3%	5.9%	8.2%

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Wafer Capacity ('000s)	2019	2020	2021F
Samsung (OTC:SSNLF)	2,935	3,060	3,260
Growth %		4.3%	6.5%
TSMC	2,505	2,719	3,000
Growth %		8.5%	10.3%
UMC (UMC)	753	772	
Growth %		2.5%	3%

Source: EENewsEurope, Techspot

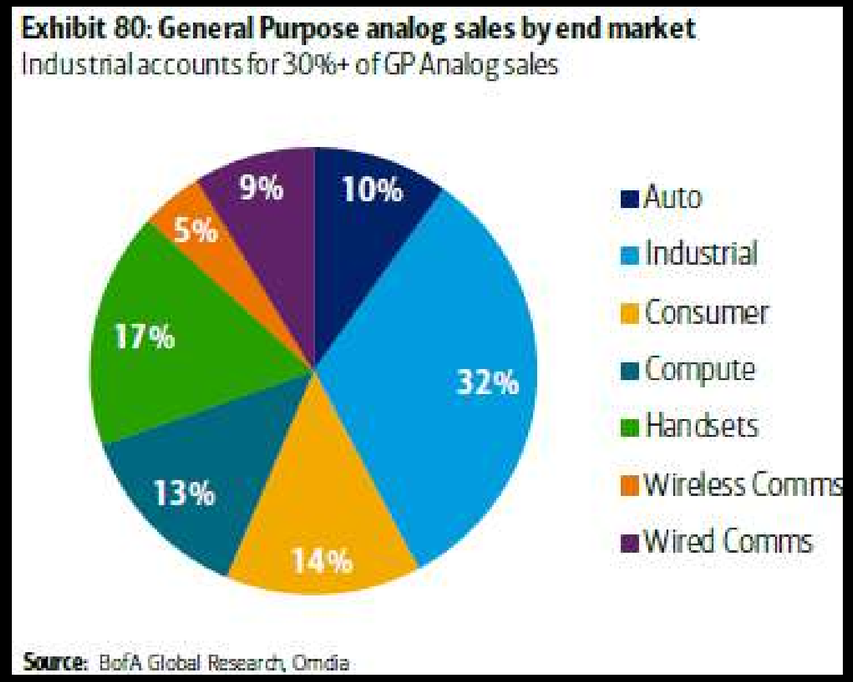


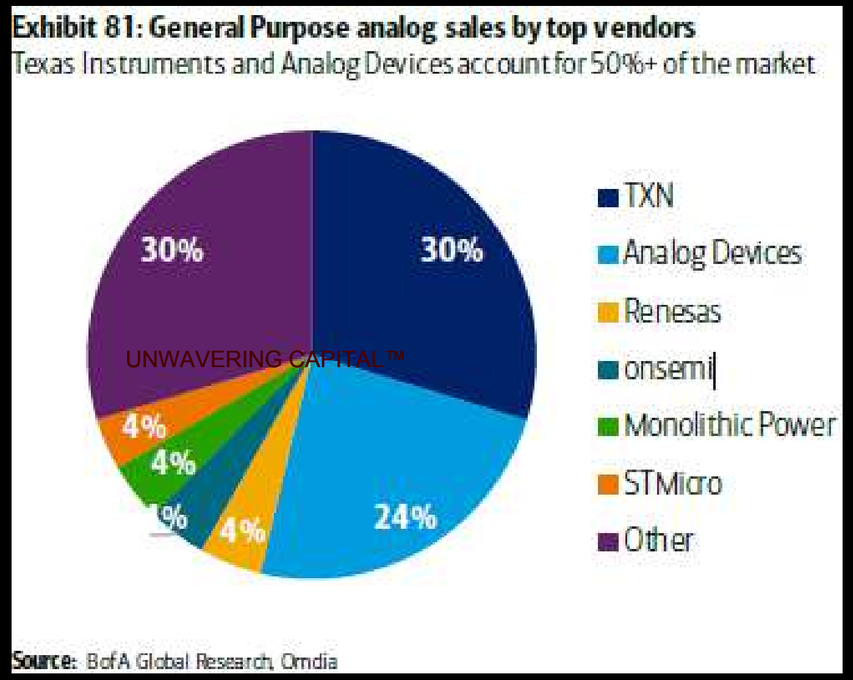


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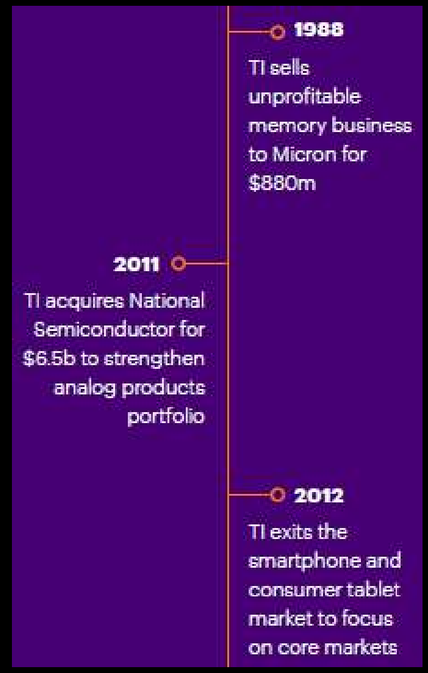
$51B GENERAL-PURPOSE ANALOG: HIGH MARGINS, GIVEN END MARKET DIVERSITY AND STABLE SHARE GIVEN PRODUCTS' LONG-LIFE CYCLE

Implement functions such as power mgmt., voltage regulation, data conversion, interface drivers, signal amplifications





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Texas Instruments maintained its leadership through the re-invention of its value chain

- As TI battled cyclical consumer electronics (digital watches, calculators), it co-developed memory with Hitachi (when competition intensified with Sun Microsystems, Sony developed MPUs, TI doubled down on partnership (JV to expand manufacturing capabilities) and formed an alliance with Canon, HP, Singapore gov, Samsung
- Organically refined its strategic direction by specializing in DSP while growing market share through M&A of Intersect, Sensor, and GO DSP

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$24B APPLICATION-SPECIFIC ANALOG: LOW MARGINS GIVEN CONCENTRATION IN MOBILE

Mobile suppliers (Qualcomm, Skyworks) hold a large share because cellular baseband modems, power amplifiers, HDD SoC have a sizable analog that gets included in the main ICs. Texas Instruments and NXP benefit from material automotive exposure.

1975

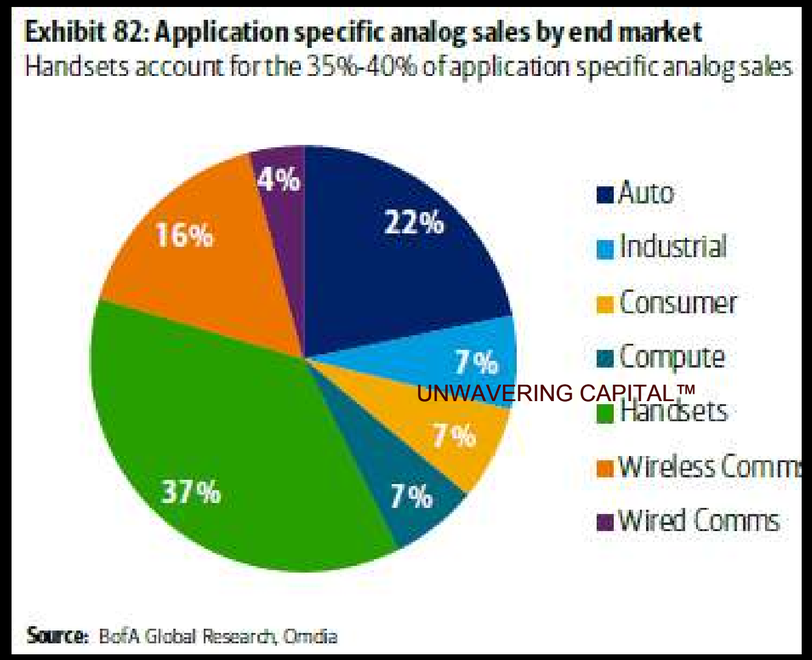
Philips acquires Signetics, which is rebranded as Philips Semiconductors

2006

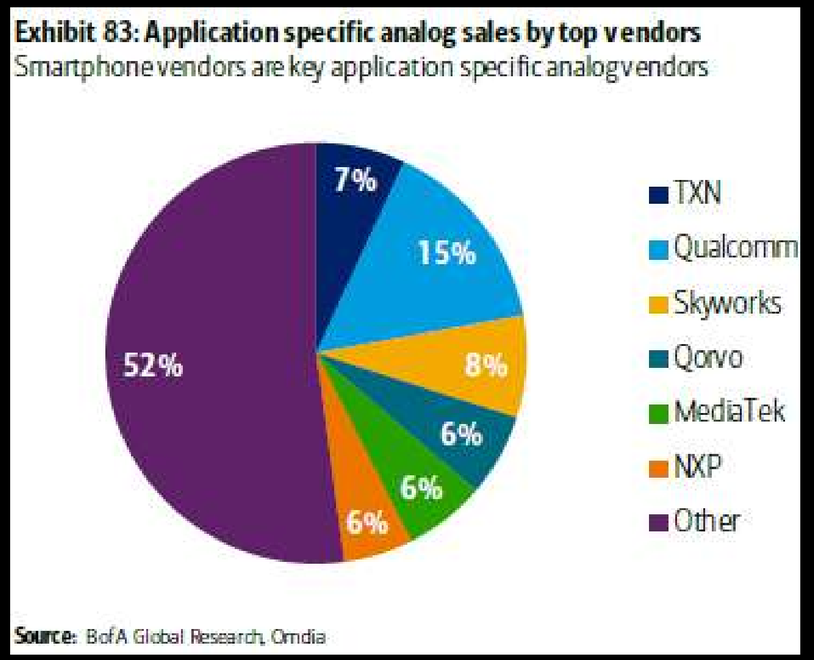
Private equity companies purchase Philips Semiconductor, which is rebranded as NXP

2015

NXP acquires Freescale (divested from Motorola) to strengthen position in automotive market



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NXP consistently ventured into new markets successfully, re-designing their business model

- With $17B Freescale M&A, they became the largest semiconductor supplier (10% share) to the $34B (ex-memory) automotive industry (which grew at 5% CAGR since 2008)
- While NXP retains its fabs, it also offloads excess demand and/or specialized to 3rd party foundries

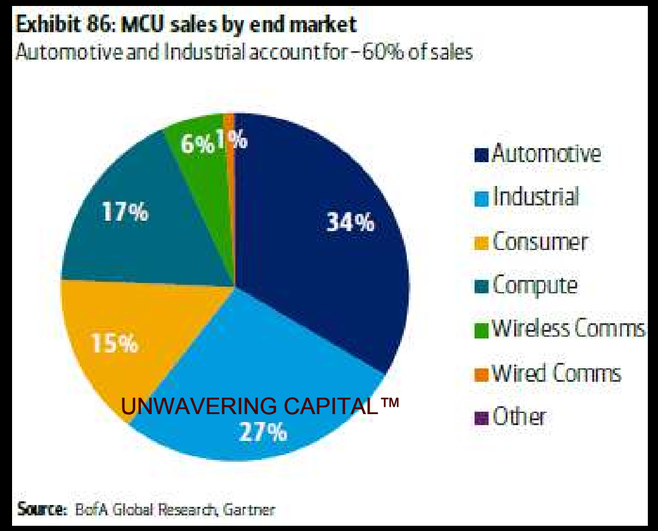
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$20B MICROCONTROLLERS (MCU): MANUFACTURED USING LEADING-EDGE PROCESS TECH

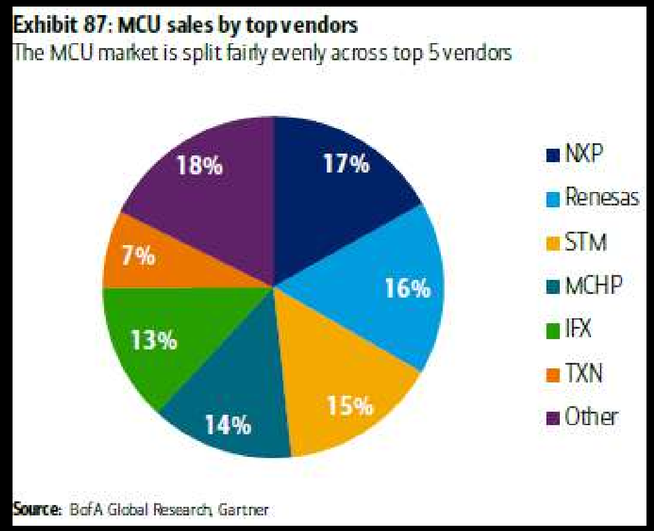
Best suited to applications that require minimal power drain and processing power; vendors are often leaders in specific mkt segments

Question for SSIC

- **Korea's president and Holland PM strengthened their existing collaboration on semiconductors:** Would Holland approve SEC's acquisition of $44B NXP (17x P/E, 6% share n $24B ASIC)? How much additional fab constructions across the globe would be needed to secure approvals from various governments?



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3 Product Families

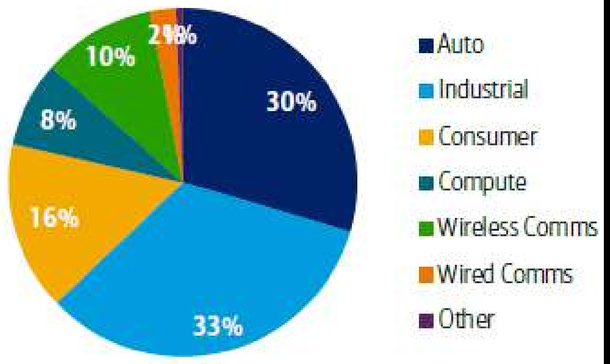
- **8-bit (15% of mkt) &16-bit (20%):** used in lower complexity, lower cost embedded applications
- **32-bit (65%):** for more complex, higher performance - been growing at a rapid pace driven by increasing demand for higher precision compute

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$30B DISCRETE: LOWER GM, INTENSENSE COMPETITION AS THEY'RE SOLD INTO MOST END MKTS

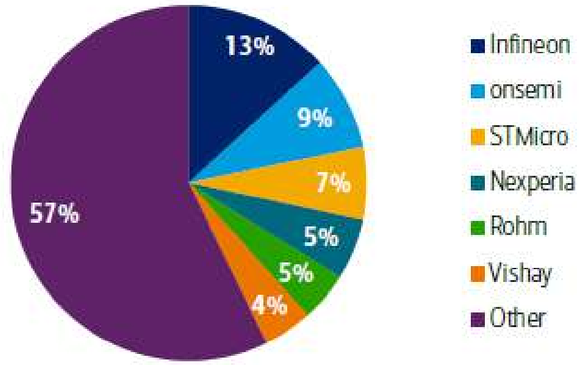
Best suited to applications that require minimal power drain and processing power; vendors are often leaders in specific mkt segments

Exhibit 88: Discrete sales by end market
Auto and Industrial account for 60%+ of sales



Source: BofA Global Research, Gartner

Exhibit 89: Discrete sales by top vendors
Discretes market share is fairly diversified (top 3 players <30% share)



Source: BofA Global Research, Gartner

3 Product Families

- **8-bit (15% of mkt) &16-bit (20%):** used in lower complexity, lower cost embedded applications
- **32-bit (65%):** for more complex, higher performance – been growing at a rapid pace driven by increasing demand for higher precision compute

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Question for SSIC

- How can SEC best respond to more advanced chips (ADAS, EV batter-based drivetrain) being fabricated more by outsourced foundries (instead of in-house fabs among NXP, Infineon, STMicroelectronics, TI, Renesas)?

Takeaway for SSIC

- **Rumored to be an M&A target, $43B Infineon** (20x P/E, 8% share in $12B sensors) **may not be attractive:** In addition to unfavorable market dynamics (low pricing power) and likely high geopolitical regulatory hurdles, SEC's top priority should be foundry (auto OEMs may also seek TSMC more if there's a conflict of interest). Also, there're concerns around:
  1. **Limited synergy -** Difficult to convert SEC's AP architecture into auto
  2. **Multi-chip packaging isn't recommended for auto** (which SEC is good at) - one chip design (analog, CPU, memory, ECC) is critical for ADAS instead of integrating many chips

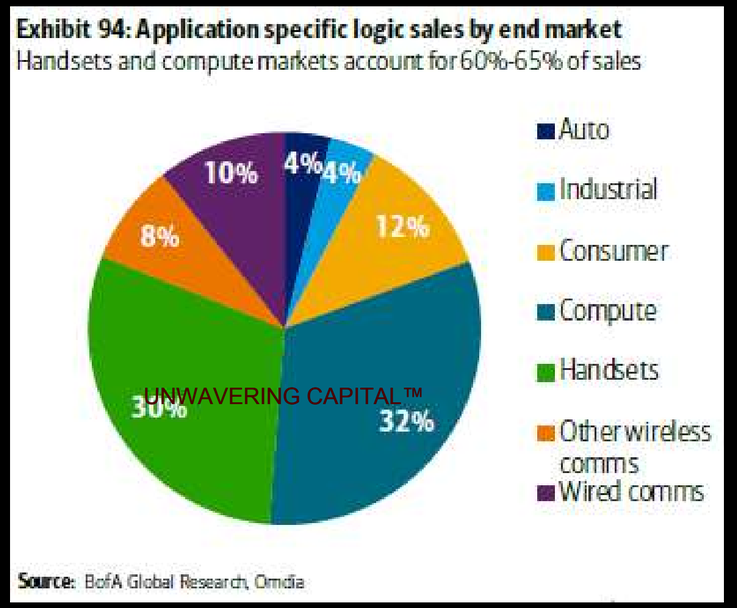
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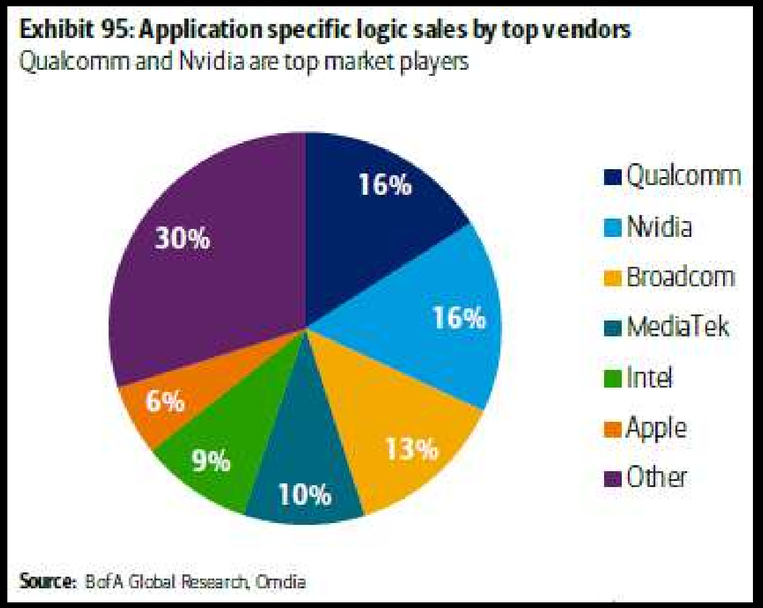
$150B LOGIC: DIVERSE IN NATURE

Application Specific Standard Products represent 85% of $125B Application Specific vs. ASIC's 15% (proprietary nature)

$7B FPGA & PLD is key within $25B General Purpose Logic (display drivers)

- **Field Programmable Gate Arrays** are ICs that're designed to be configured for different algorithms after production
- Modern FPGA devices consist of millions of logic cells that can be configured to implement a variety of software
- AMD's Xilinx (60% market share), Intel (20%)





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ASICs are designed and manufactured for the exclusive use of a single customer

- ASIC may be a digital, analog, mixed-signal chip, and typically combines functional flobkcs such as processor cores, memory, interface circuits, analog, and custom logic
- E.g. Apple's A-series processors in iPhones and iPads

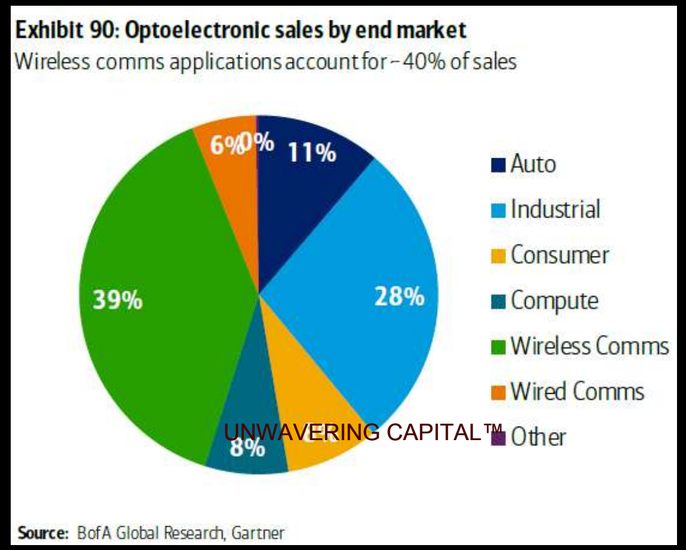
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$40B OPTOELECTRONICS

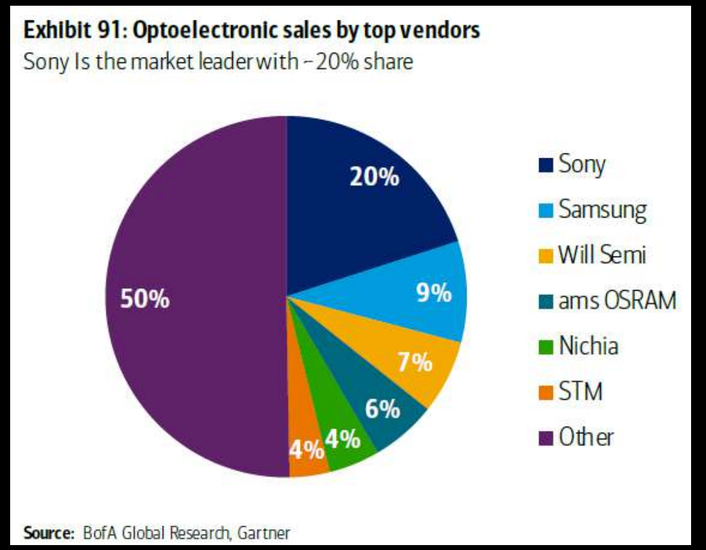
ASPs are typically 15c-30c, with unit volumes >200B

Question for SSIC

- Besides the subsector's features that seem to require cost advantage particularly, how did China get an 18% share?
- What strategies is Sony employing that enable maintaining its leadership?



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Types

- **Light sensing products:** photo sensors, Charge-Coupled Devices (capable of photoconduction and memory)
- **Light emitting devices:** LEDs, lasers

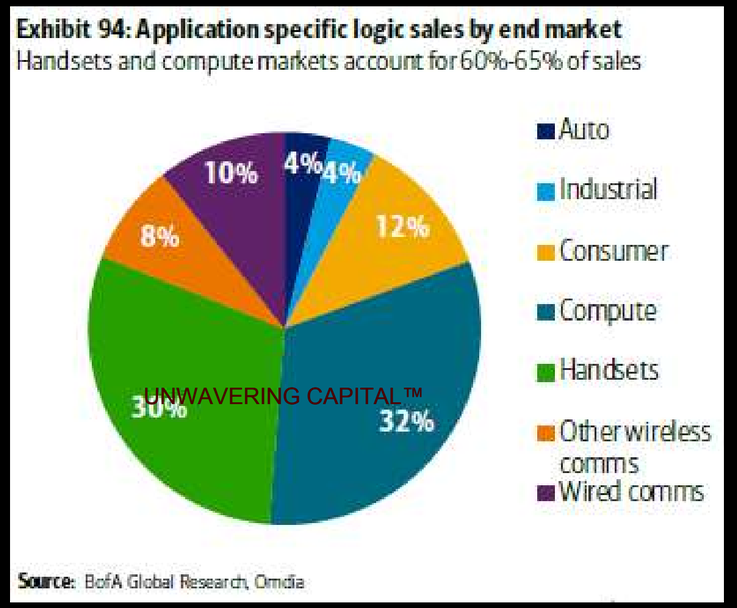
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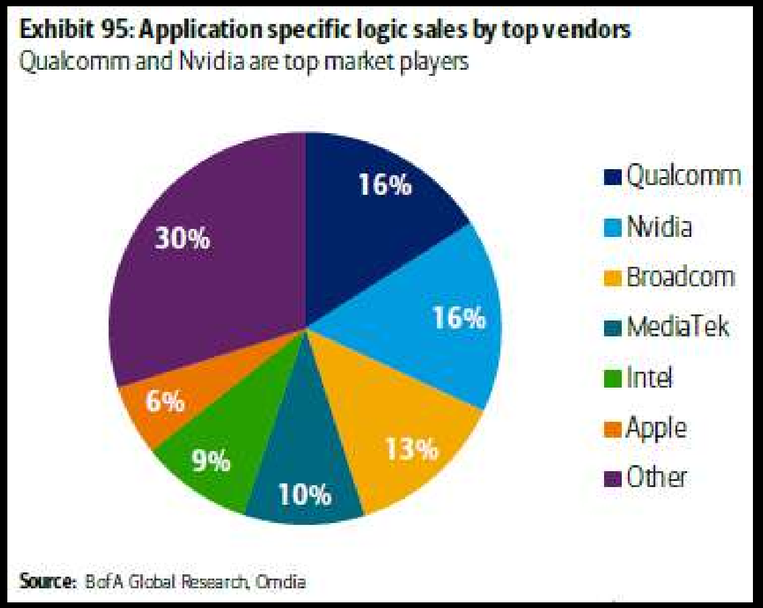
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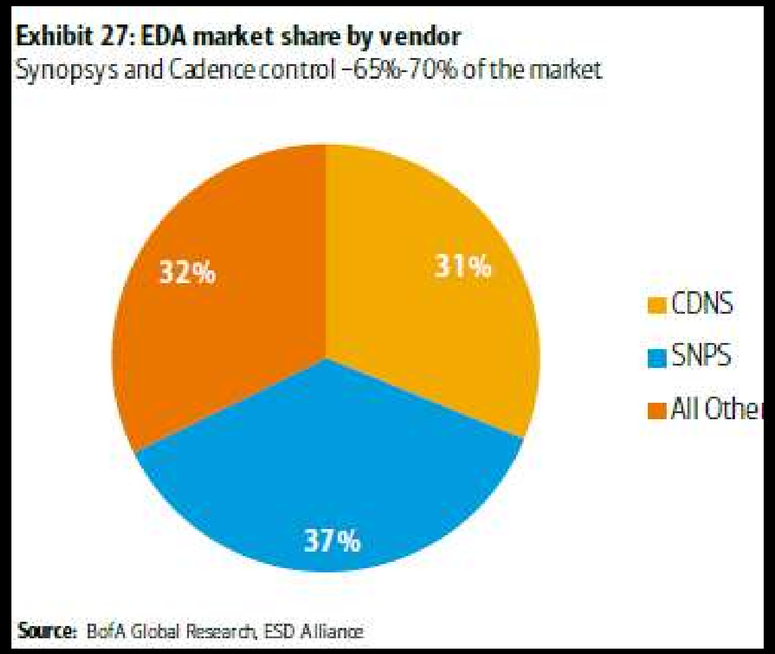
ASICs are designed and manufactured for the exclusive use of a single customer

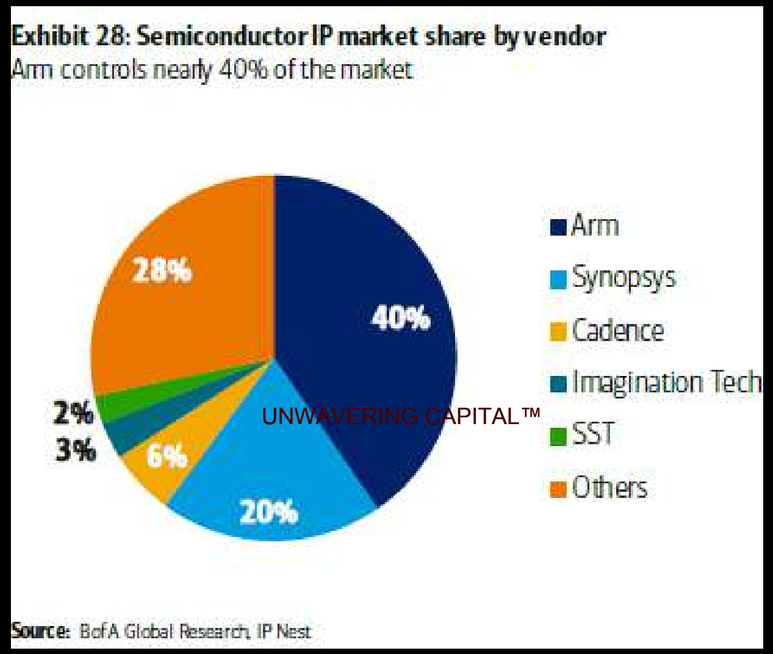
- ASIC may be a digital, analog, mixed-signal chip, and typically combines functional flobkcs such as processor cores, memory, interface circuits, analog, and custom logic
- E.g. Apple's A-series processors in iPhones and iPads

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IMAGINATION TECH (MIPS) IS BRITISH IP OWNED BY CHINESE PE/GOV

US: $51B Synopsys, $46B Cadence, $42B Microchip Tech (MCU/DSP/Analog IDM, Flash-IP)'s SST (41% exposure to Industrial, 15% to auto)





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Question for SSIC

- Was SEC buying a 3% stake in Sharp for $110M in 2013 as Apple took screen orders from SEC to Sharp a great strategic move? Your answers would help me better assess SEC's potential purchase of a partial stake in Arm IPO or a portion of Arm pre-IPO
- Color on what kind of partnership could be (or is being) forged between Arm and SEC?

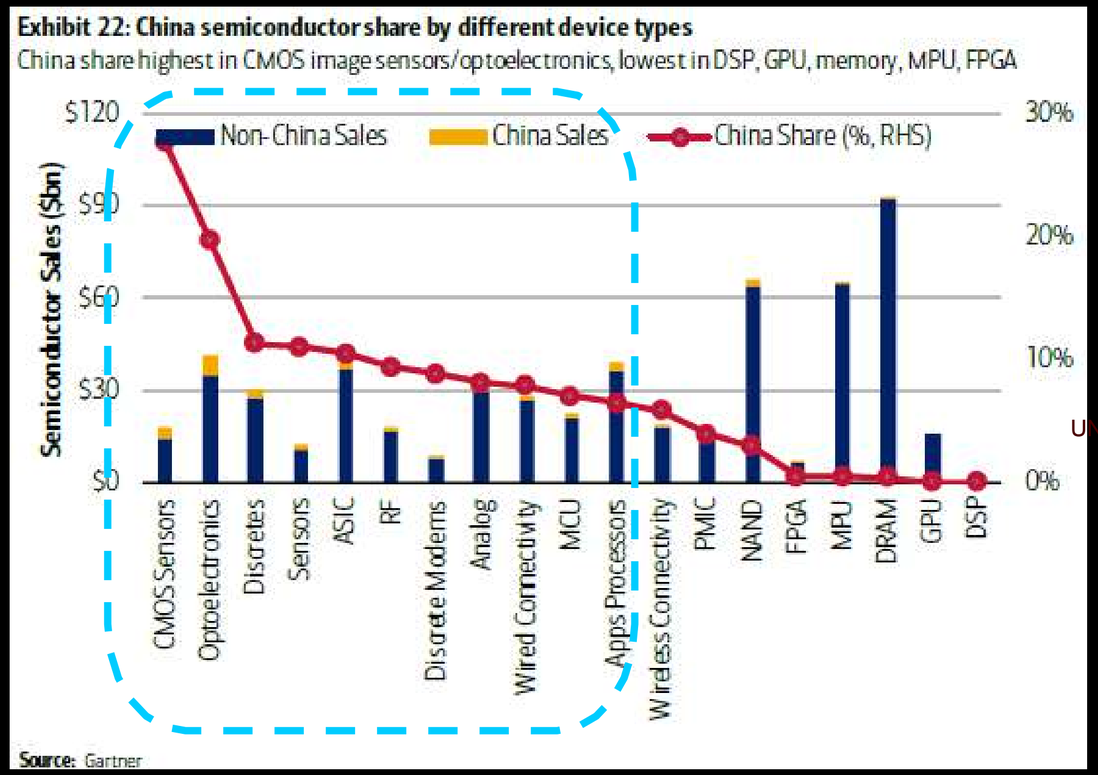
Arm has a 90% share of mobile IP designs

- IP is pre-designed blocks of circuits for the designs of complete semi devices
- Business model is to license IP for these components and the instructions set, enabling customers to build systems around them that incorporate their own designs as well as Arm's (done the hard part for them)
- Apple and AMZN have started to utilize Arm components in PC/servers too

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CHINA HAD SUCCESSES IN LESS COMPLEX DEVICES (VS. IC)

Focusing on subsectors where China's share is high would have a better likelihood of getting regulatory approval



Buyer	Target	Deal Type	Deal Size ($B)	Date	Target Industry	Extra
Nvidia (US)	*Arm (UK)*	*M&A*	*$40*	*10/29/2020*	40% of IP (esp. mobile)	*FTC sued, "illegal vertical merger", UK also disapproved for job loss concerns*
Analog Devices (US)	Maxim Integrated Products (US)	M&A	$20	7/13/2020	Analog IDM	China antitrust approved
Applied Materials (US)	*Kokusai Electric (Japan)*	*M&A*	*$3.5*	*7/1/2019*	*Semi Equipment*	*China blocked as it would impeded on its effort to develop a home-grown equipment suppliers (NAURA)*
Broadcom (US-based Singapore origin)	*Qualcomm (US)*	*Hostile M&A*	*$117*	*11/6/2017*	*15% share in $24B ASIC*	*Trump blocked - "would reduce R&D on wireless tech essential to naitonal security"*
Qualcomm (US)	*NXP (Holland)*	*M&A*	*$44*	*10/26/2016*	*17% share in $20B MCU & 6% share in $24B ASIC*	*Despite limited overlap (cleared in 8 jurisdictions), China delayed and instructed Qualcomm to refile (in retaliation of US sanctions on ZTE)*

Note: Italics are deals that were terminated

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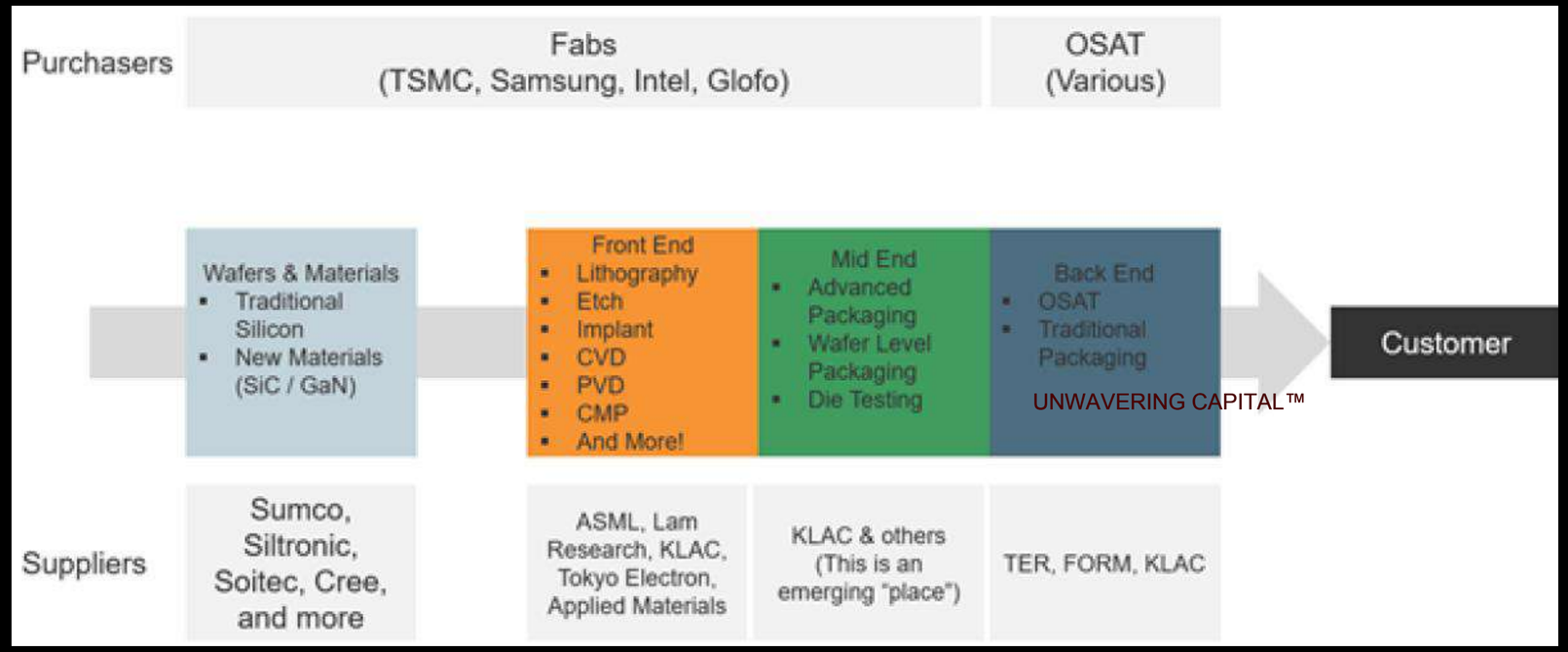
Question for SSIC

- Why didn't NXP just sell its digital networking business (the initial asset that NXP-Qualcomm was discussing) and/or assets that weren't subject to Chinese jurisdiction?

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FABS ARE WINNING AGAINST OSAT MOVING UP THE CHAIN

As the front end struggles to scale geometry (Moore's law), packaging (viewed as a cost center) has become strategic

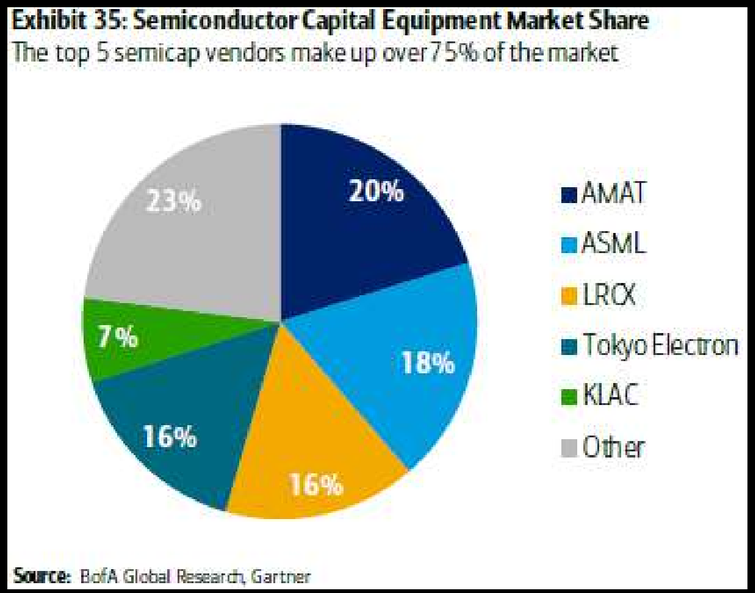


Question for SSIC

- **Thoughts on acquiring one of $87B (57% of total semi-capex) Wafer Feb Equipment companies** (9% CAGR, 1.4x faster than semis)?

- ASML CTO: "High NA EUV might be the end of the line" as Hyper-NA, although technologically possible, is economically unfeasible as of now - thicker metal pieces for better connectivity and input/output problems could be solved by improving packages

- In the lithography market, ASML has 86% share (only producer of $200M EUV), Nikon has 10%, Canon has 4%



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STRATEGIC FOCUS COULD CHANGE – PARTNERSHIP GRANTS FLEXIBILITY

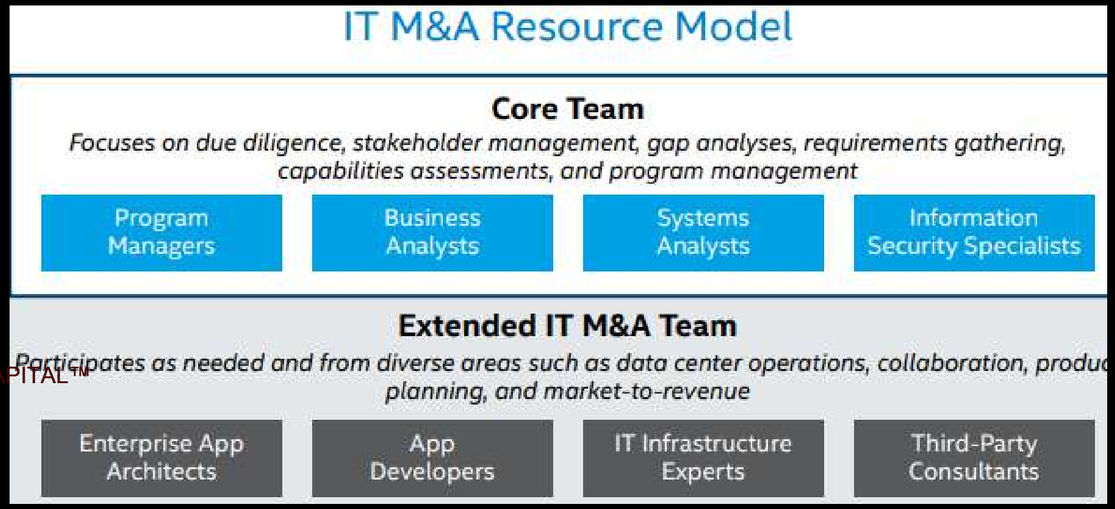
Although Intel touted security as its focus area, it faced more immediate strategic concerns (server, PC, ADAS)

Buyer	Target	Deal Type	Deal Size/EV	Date	Rev
Intel	McAfee	M&A	$7.7	8/19/2010	3.8x
TPG	McAfee (Intel)	51% Carveout	$4.2	9/7/2016	1.7x

Only buy targets that have realistic integration roadmaps (due diligence rigorously with internal tech experts rather than theoretical speculations)

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- Intel paid a lofty 60% premium for McAfee to design chips that protect systems better than security software alone
- After its failed integration and underinvestment, Intel sold it at a $3.5B lower price
- Intel and McAfee had been collaborating for ~18 months on a prior alliance and they mistakenly concluded that M&A could pay off



Takeaway for SSIC

- **Don't spread itself too thin:** laser focus on product lines that already have either a commanding market position or clear potential (logic foundry) over limited revenue opportunities (Samsung TV Plus – OTT, low-node memory)

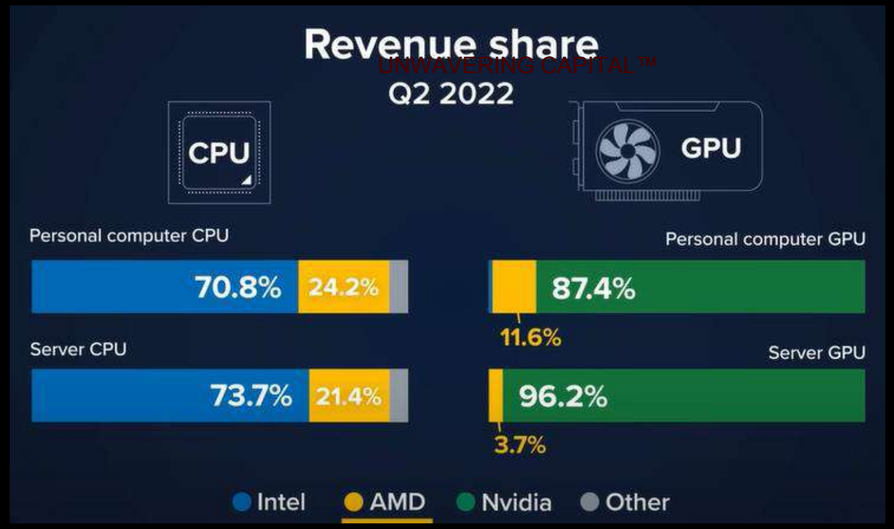
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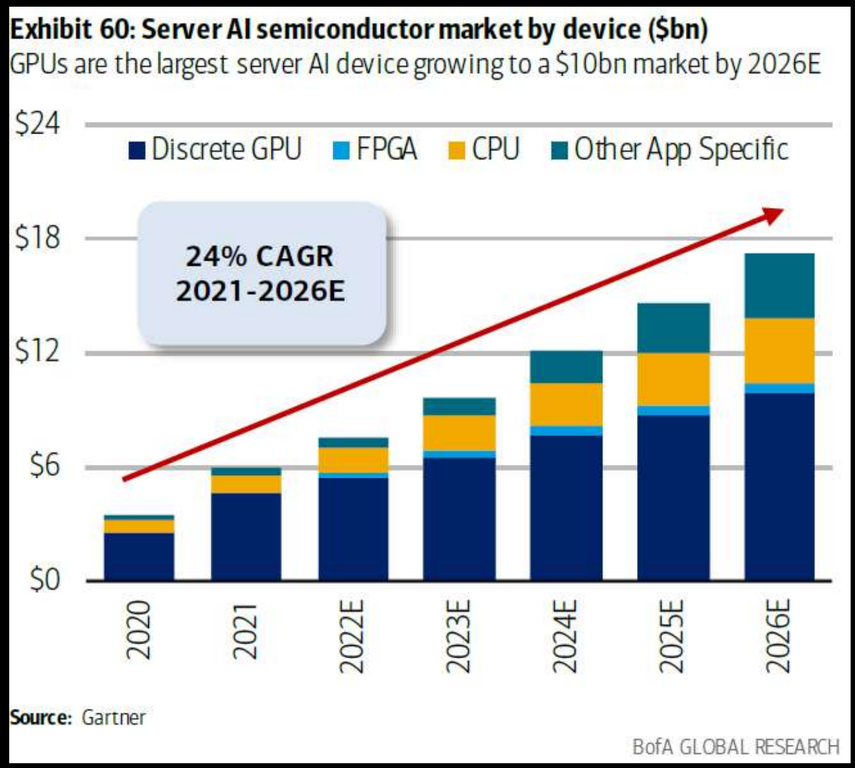
PENETRATION DECISIONS SHOULDN'T BE TO SOLELY CAPTURE LARGE/FAST-GROWING TAM

Portability of capabilities into seemingly adjacent markets shouldn't be overestimated

- INTC's Xeon could be 3~4x of Nvidia AI processor as CPUs are the most widely used chips for AI acceleration
- However, Habana Labs ($2B M&A) is only the 4th largest player in a GPU-based AI Processor that's dominated by NVIDIA (81% share)
- AMD's acquisition of #2 player, Xilinx will make Intel's efforts to take share more difficult

Buyer	Target	Deal Type	Deal Size ($B)	Date	Rev	Target Industry	Target Subsector	Target Tech
AMD	Xilinx	M&A	$49	10/27/2020	15.3x	Programmable Logic Device (PLD)	Field Programmable Gate Array (FPGA)	base (silicon, logic tools, boards, reference designs), domain (embedded processing, DSP, FMC daugther cards), market (IP, custom tools & boards)
Intel	Habana Labs	M&A	$2	12/16/2019	--	AI, Server, Cloud	Programmable DL accelerator	Gaudi AI large-node training systems may deliver 4x throughput vs. systems built with equivalent # of GPUs





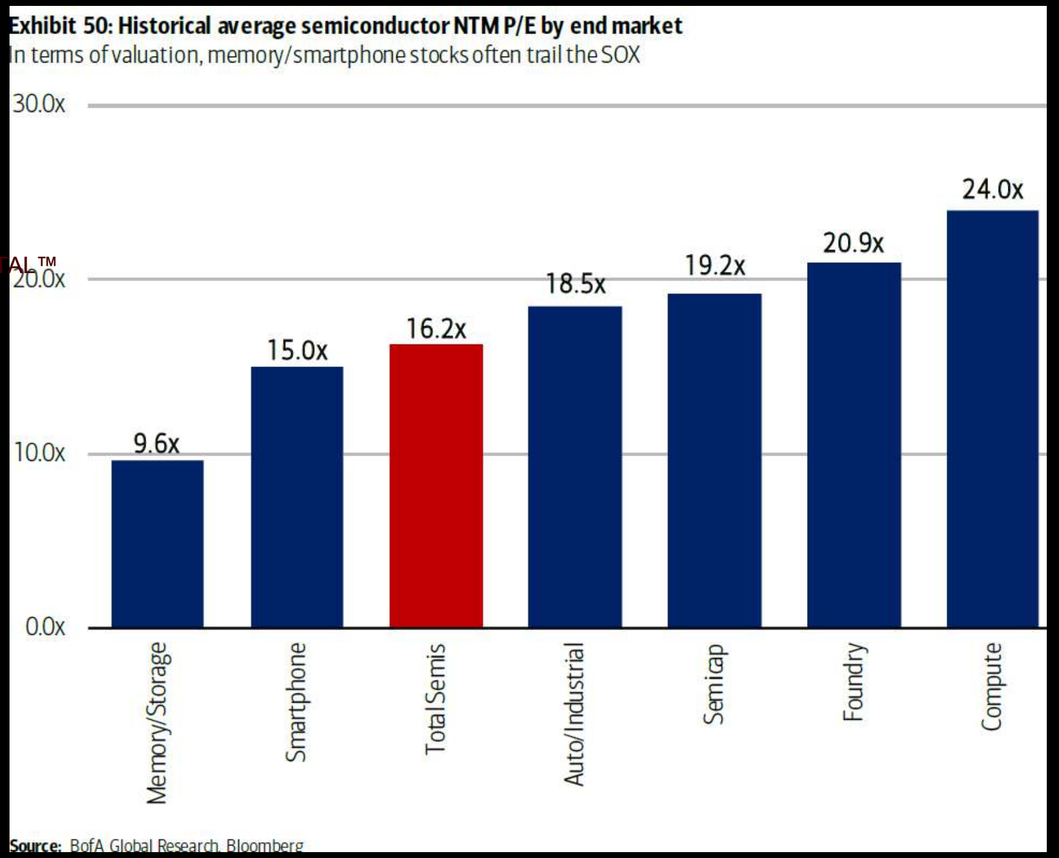
INTEL'S UNDISCIPLINED, DISTRACTIVE AND COSTLY M&A

Buyer	Target	Deal Size ($B)	Date	Rev	EBITDA	P/E	Target Primary Industry	Target Subsector	Target Tech
Intel	Altera	16.7	6/2/2015	8.6x	33.0x	24.0x	Data Center, IoT	Programmable logic semi	Leading Field-Programmable Gate Array (FPGA) tech, IP cores, dev tools

Avoid overpaying, even if it's strategic and always consider the opportunity cost

- Intel paid 24+ peak PS despite $0.02 EPS accretion est. (despite assuming 20% operating synergies)
- Intel argued the tech advantages of merging its MPUs with Altera's fabless FPGA (31% share behind Xlius' 36% in 2013)
- Takeover talk was ended initially due to price disagreement, but Intel ultimately paid a 56% stock premium to retain its 95% market share in profitable server chips (50% of Intel's profits) against QCOM
- Altera's M&A deprived Intel's focus/capital to acquire AMD

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TRANSPARENT AND COLLABORATIVE PARTNERSHIPS ARE KEY

Buyer	Target	Deal Type	Deal Size/ Ent Val ($B)	Date	Target Subsector	Target Tech
Volkswagen	Argo AI	VC	2.6	6/2/2020	AV tech (HD mapping)	Impressive in-house LIDAR (improved from Princeton Lightware), Tested in Austin, Miami, Washington DC
Ford	Argo AI	VC	1.0	2017		
Lyft	Argo AI	VC	*0.1*	--		

"Sharing development costs" but no cooperation on developing AV is an undesirable way to coinvest - either share risk and insights or be a sole acquirer to keep the entire reward

- Ford: "will remain fiercely competitive in building own AV" despite it co-investment with VW – when Argo AI closed (likely due to its inability to attract new investors) , its parts absorbed into 2 main backers (Ford recorded $827M net loss with $2.7B impairment)
- Ford failed to deliver on its goal of bringing AV broadly to market by 2021 – "optimistic about a future for L4 ADAS but profitable, fully AV at scale are a long way off and development & customer enthusiasm for L2+ and L3 ADAS warrant capital allocation in those areas"
- Ford could buy AV tech again, instead of developing it in house and plans to use its software unit (Cariad) to develop AV with Bosch and Horizon Robotics (in China in the future)

Diversifying its partnerships for tech development and minority investment may be great ways to mitigate concentration risk

- Lyft's 2.5% stake in Argo may have allowed it to have some exposure to its AV tech and initiate relationships with Ford and Volkswagen -
- Lyft said Argo AI closure doesn't impact its AV strategy/positioning due to its partnerships with Motional & Waymo (100k paid AV rides completed in N.A.)

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Question for SSIC

- What enabled GM's $1B+ Cruise M&A to pay off while Ford/VW's $3.6B Argo investment didn't? Did no OEM nor Tier-1 bid a reasonable price, or did Ford/VW dilute out the founders?
- To what extent does a minority investor have access to the target's tech and investor base?
- How could Lyft forge multiple partnerships that may be conflict-of-interest?

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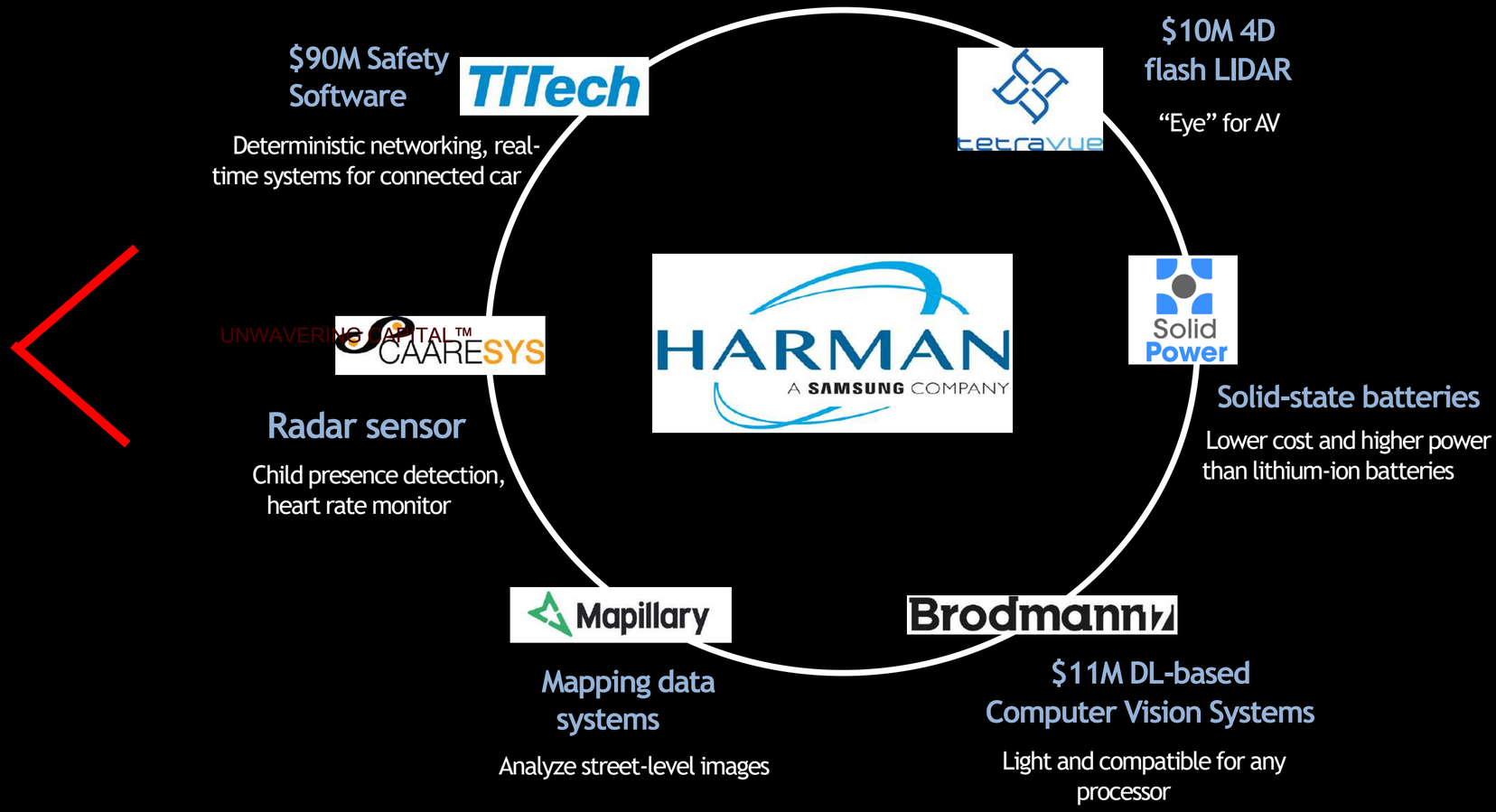
INVEST IN AN ARRAY OF TECH TO BUILD AN ECOSYSTEM

Deep-pocketed parent enables accelerated growth via R&D and complementary investments

Buyer	Target	Deal Type	Deal Size ($B)	Date	Target Industry
Broadcom	Symantec	M&A	$10.7	8/8/2019	Enterprise security
Accenture	Symantec (Broadcom)	M&A	--	1/7/2020	--

Consider future investments needed to scale the target's ecosystem as part of its M&A due diligence

- Only after 2 months of closing Broadcom's acquisition of Symantec, it sold it to Accenture without disclosing financial terms, signaling the high likelihood that it was sold at a loss (when considering time/focus, banking/legal fees, the loss would be greater)
- Broadcom likely saw Symantec simply as a revenue stream and underestimated investments needed to scale the cybersecurity business



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HIGH FRONT-END COSTS & OBSOLESCENCE RISKS DEFINE ICT

Constantly changing strategies (capital allocation, M&A, partnerships, org. structure) is critical

Divest (portfolio reshuffle, restructure)

- Sell businesses that compete against dominant players (and are losing market shares) in fragmented, unprofitable, volatile, competitive (esp. on price), risky (regulatory, rapid tech change), mature, and slower-growing sectors
- Divestitures create 2x+ shareholder value of M&A

Samsung's exit

- *General Chemical, Techwin (video surveillance), Tales (defense), Total Petrochem to Hanwha*
- *SDI's chemical division to Lotte & $1.1B Printing business to HP*

Samsung's close

- *Desktop PC (product realignment towards profitable variants such as laptops, tablets)*
- *LCD*

M&A (portfolio reshuffle, restructure)

- A series of small and local deals may be a good route to avoid regulatory approval overhang and sizeable termination fees as well as better chance of realizing synergies/integration

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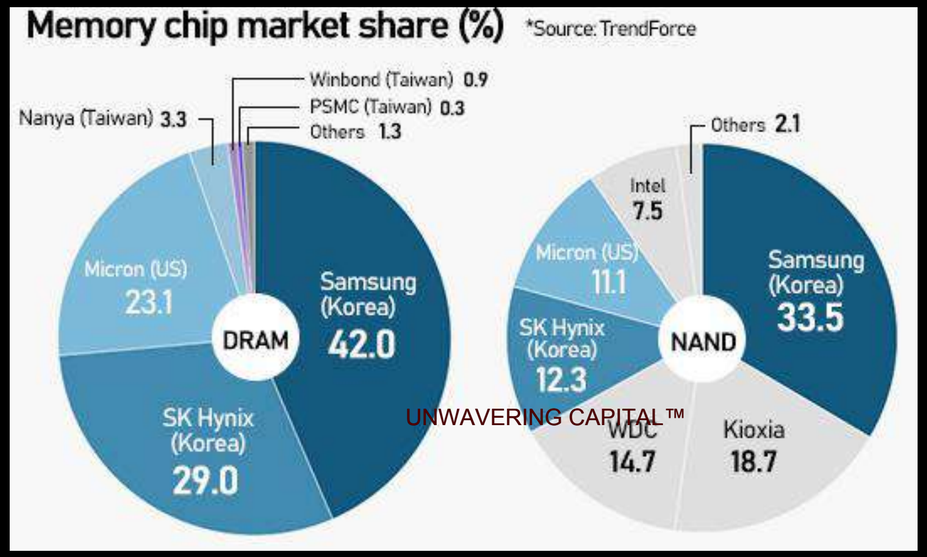
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CONSOLIDATION IN VOLATILE $90B DRAM AND $60B NAND MARKETS

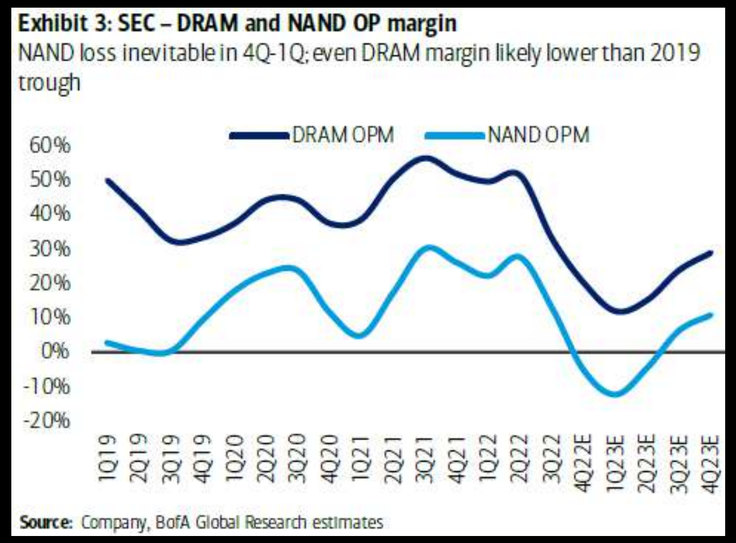
SEC's DRAM/NAND grew 15% and 14% from '12 to '21 (expected to grow 13% and 9% from '22 to '31

Buyer	Target	Deal Type	Deal Size ($B)	Date
Western Digital	*Kioxia*	*M&A*	*$20.0*	*8/26/2021*
SK Hynix	Intel's NAND/SSD	M&A	$9.0	10/19/2020
SK Hynix	Kioxia (Toshiba Memory)	Club M&A (19.4% stake)	$18B (SK Hynix - $3.5B)	9/28/2017
Micron	Inotera Memories	M&A	$4.0	12/6/2016
Micron	Inotera (Taiwan)	M&A	$4.0	12/6/2016
Nanya (Taiwan)	Micron	5% stake PIPE	$1.0	11/10/2016
Western Digital	SanDisk	*M&A*	$18.0	10/21/2015

- Micron to invest $100B in NY fab over next 20 years - most memory companies still employ IDM business model (SEC, SK Hynix)



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Question for SSIC

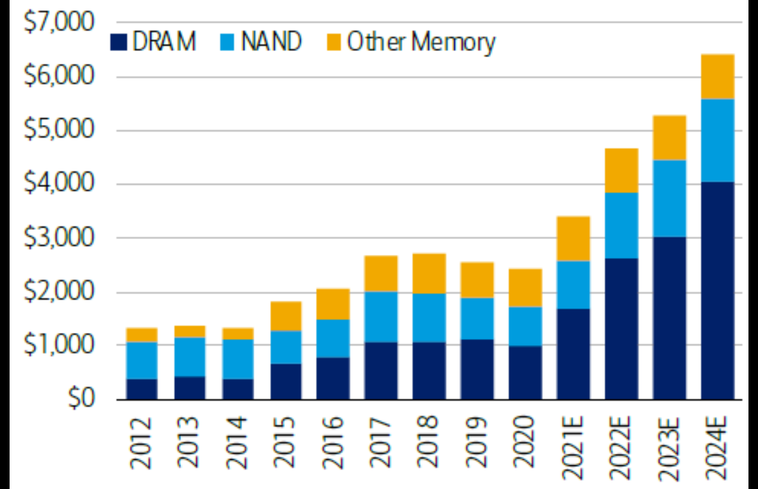
- Thoughts on SEC acquiring Taiwanese $6B mkt cap Nanya & $3B Winbond (specialty auto DRAM contributes 10%+ rev each) or $2B Silicon Motion (SSD, eMMC, UFS controllers for in-vehicle infotainment and AV)?
  - According to NXP ex-CTO, 95% of auto chips are fabricated at old nodes (350-40nm: 70%, 40-10nm: 25%, 8-10nm: 5%
  - Will regulators approve? Would they be synergistic?

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$100B AUTOMOTIVE TECH TAM IN 2025: EV AND AV PUSH CHIP CONTENT BY 2X & TO $1K

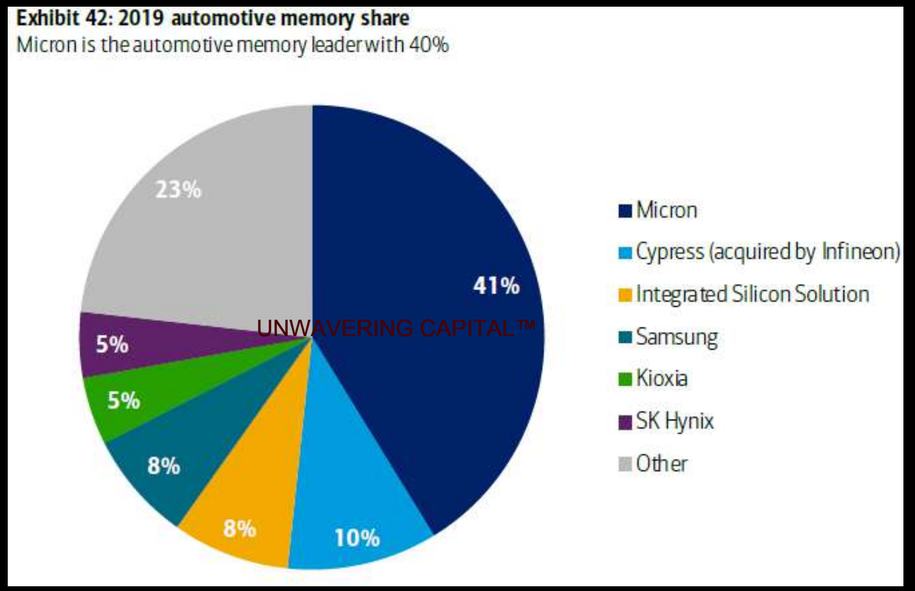
$6B ADAS est. to grow at 22% CAGR over next 4 years & AV would be the most sophisticated tech endeavor

Exhibit 41: Automotive memory sales by memory device type
Auto memory sales expected to accelerate after 2020 led by DRAM growth



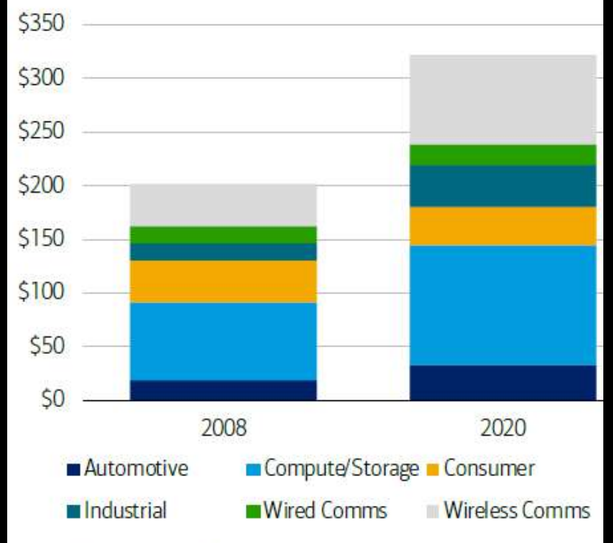
Source: Gartner

Exhibit 42: 2019 automotive memory share
Micron is the automotive memory leader with 40%



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Exhibit 4: 2008 vs 2020 semi end market revenues
Automotive revenues grew more than 80% to $34bn in 2020



Source: BofA Global Research , Gartner

Question for SSIC

- How did Micron manage to gain a dominant position vs. #1 NAND & DRAM leader, SEC?

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SEC BOUGHT HARMAN AT AN ATTRACTIVE PRICE

Indeed, we'd need more time to better assess the ROI of these M&As and these companies aren't fully comparable

Buyer	Target	Deal Type	Deal Size ($B)	Date	Rev	EBITDA	Past 3yr Rev CAGR	EBITDA Margin	Target Subsector	Target Tech	Target Customers	Rationale	Extra
Intel	Mobileye	100% stock Acquisition	$15.3	3/13/2017	41x	110x	42%	34%	ADAS, Computer vision, ML, chips	Breaks without driver intervention, adapting cruise control, keeps in driver's lane, navigate traffic	9 OEMs (TSLA, GM, BMW w/ Intel), EyeQ chips into 16M cars	Develop camera to avoid collisions	TSLA cut MBLY's units out of its car
Samsung	Harman	100% cash Acquisition	$8.0	11/14/2016	1.1x	9.4x	17%	10%	ADAS, visual products, telematics, cybersecurity	#1 in oligopoly Infotainment (24% share vs. 2nd player's 13%), #4 in consumer audio (6%). Digital cockpit, safety, OTA	30M in 2016 to 50M automobiles (Sep '22)	4.0 Industrial Revolution (Pivot into $100B Auto Elec - *TAM by 2025)*	$24B auto order backlog, 6.3k patents
NXP	Freescale	Merger (53% cash, 47% equity)	11.8 ($40B merger)	3/1/2015	2.5x	15.1x	0.4%	17%	Semi IDM (General Purpose MCU)	Powertrain, safety, body electronics (using Freescale's tech, NXP expects to develop a single integrated radar chip that will replace its Elmos' ultrasonic radar systems in advanced vehicle safety and foray into video siplay dashboards)	--	to 2x auto-related revenue (NXP assemble discreet automotive applications into more complete systems running on top of Freescale processors)	Building on NXP's leading positions in audio infotainment, security, vehicle networks, health wearable, payments
Average			$13.6		8.4x	33.3x	0.2x	0.2x					

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Target	Deal Type	Deal Size /EV ($	Market Cap	Date	Rev	EBITDA	Past 3yr Rev CAGR	EBITDA Margin	Target Industry	Target Subsector	Target Tech	Target Customers
Mobileye (MBLY)	IPO	$22.8	23.6	11/28/2022	12.3x	38.3x	27%	33%	Auto	ADAS, Computer vision, ML, chips	Breaks without driver intervention, adapting cruise control, keeps in driver's lane, navigate traffic	25+ OEMs for safety (50M+ cars), 13 OEMs for AV

Question for SSIC

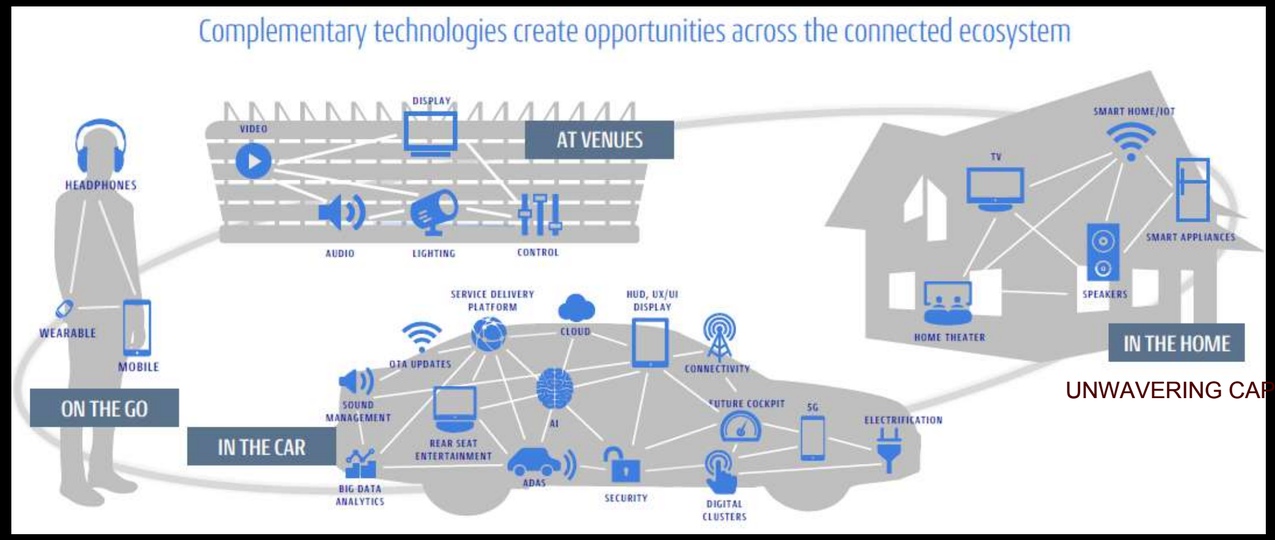
- Why do you think Intel IPO Mobileye (vs. SEC keeping Harman)? Why didn't SEC buy Mobileye?

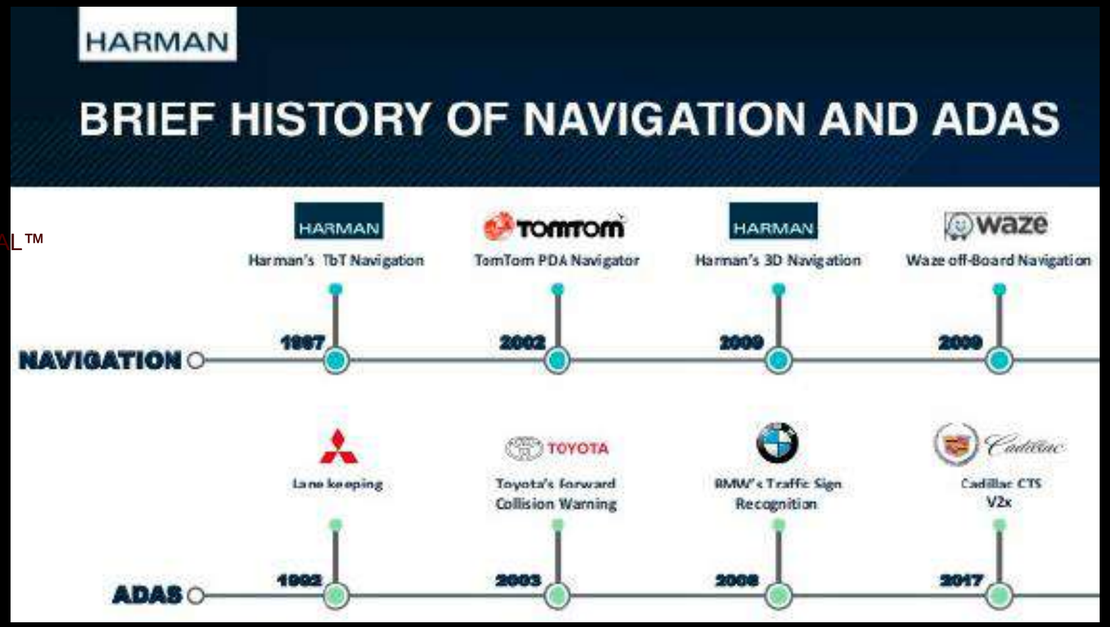
Divisions	Divisions	Rev 2016 *in $M*	as % of total rev	YoY Growth Rev	YoY Growth EBITDA	Mkt Share	5 Yr Growth to 2021
Connected Car	VoiceInfotainment, telematics, safety, OTA update	3,320	44%	7%	9%	24%	--
Lifestyle Audio	Consumer headphones, auto speaker system	2,410	32%	10%	11%	40%	--
Professional Solution	Light/video/control/auto for B2B applications, concerts	1,045	14%	3%	14%	--	--
Connected Services	Cloud,data anlytics, software solutions	694	9%	--	--	--	--
		7,469					**2.1%**

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I LIKE SEC'S PIVOT TO BUILDING AN ECOSYSTEM AROUND CONSUMERS (FROM PRODUCT)

Consistent with SEC M&A of $200M SmartThings (IoT) in Aug 2014 and $250M LoopPay (Feb 2015)





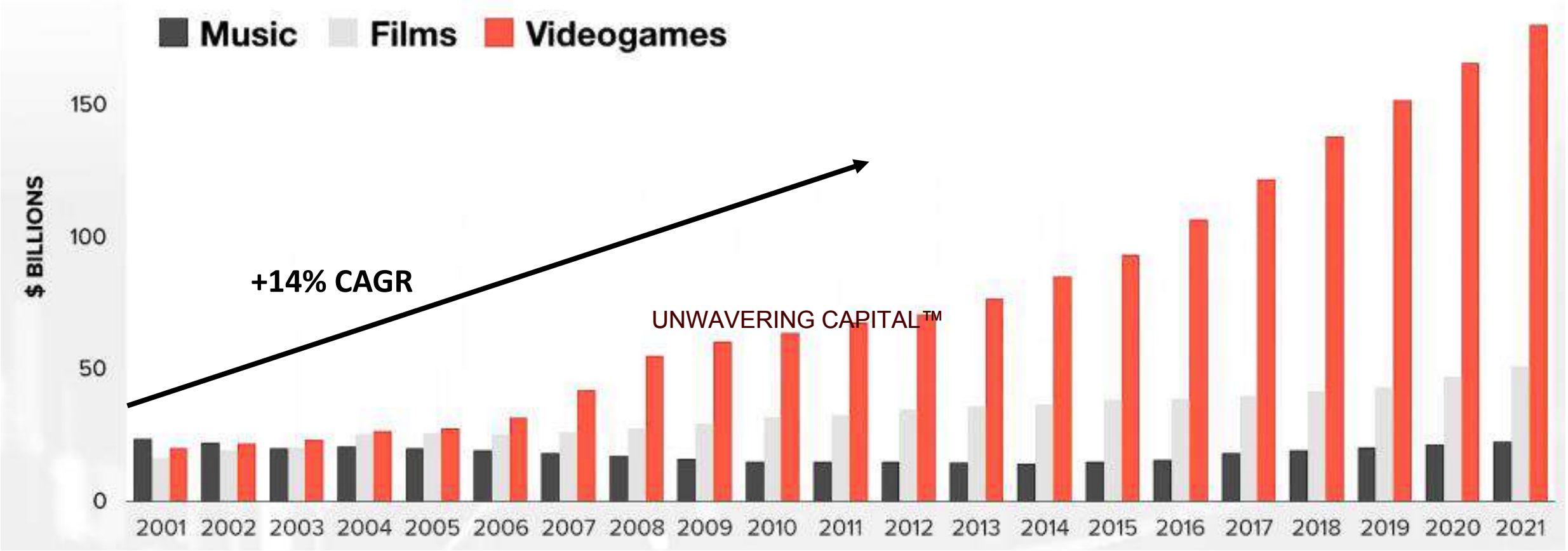
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M&A helped SEC to increase market share immediately, reduce potential risks of carrying out green-field investments as SEC had done in Vietnam & China

- The reach of SEC and Harman 2x+ (closer to leading auto OEMs' needs)

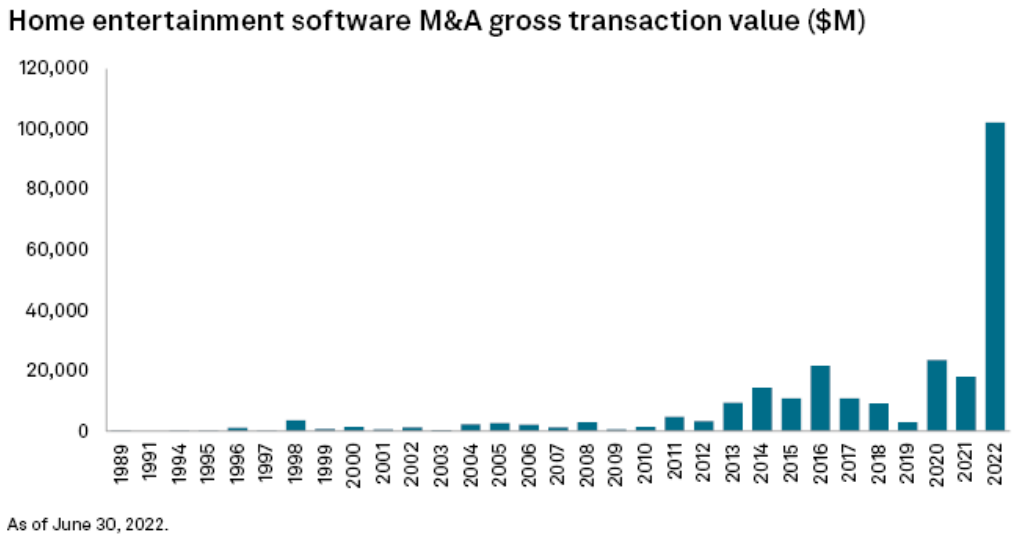
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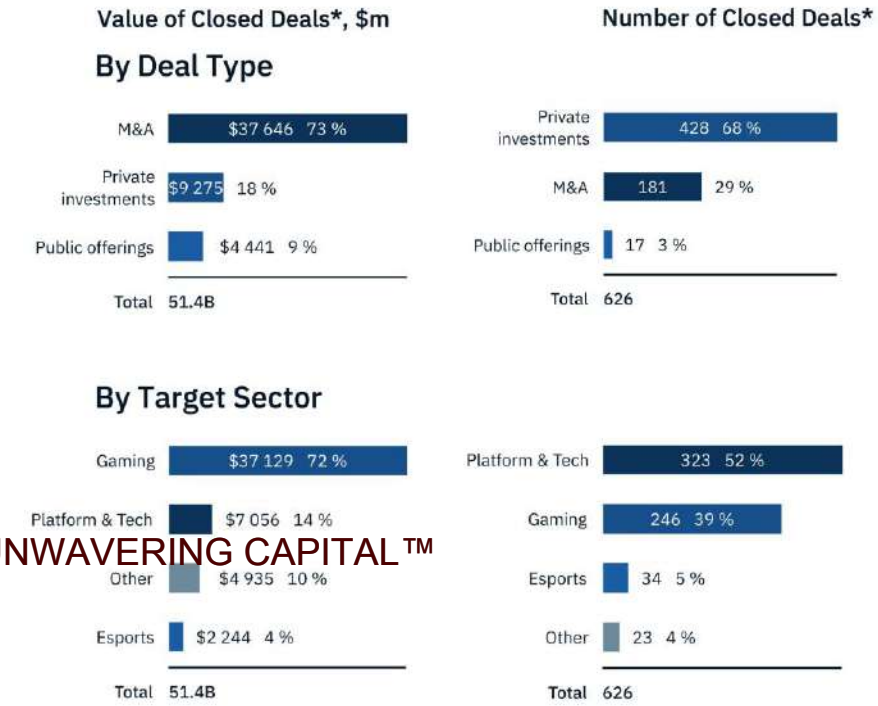
3B Gamers and $185B TAM, expected to grow at 8% through 2026



World's largest video game platform, benefitting from an industry shirt to recurring revenue streams, such as online multi-player, in-game purchases, and subscription programs

Robust Deal Pipeline, Diverse Deals (VC, M&A, Investments)



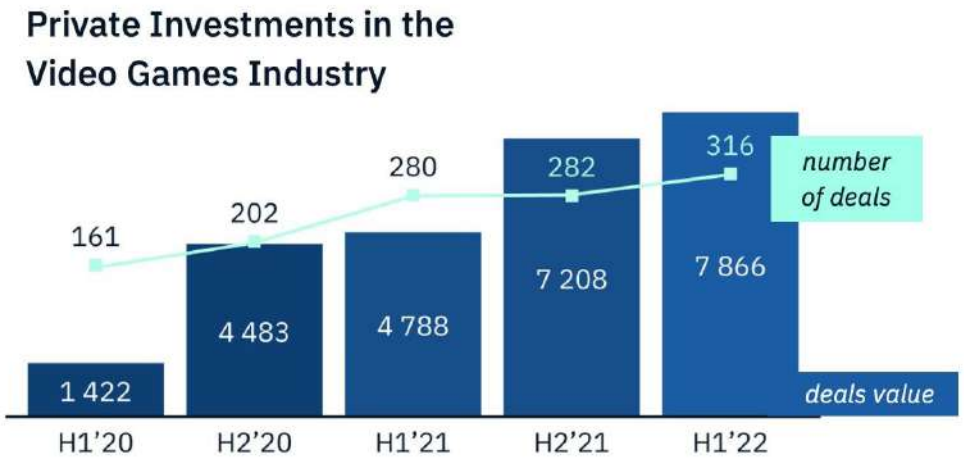


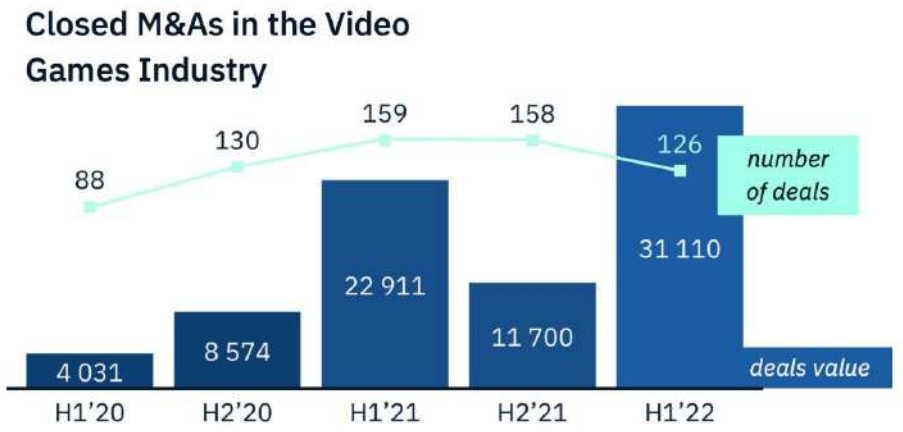
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Total

$51.4B
value of 626 deals (closed)

$124.5B
value of 636 deals (closed + announced)





Consolidation in Mobile Gaming, the Biggest (50%+) and Fastest-Growing Segment

Announce Date	Buyer/ Investo	Target	Deal Type	Deal Size ($B	Rev	EBITDA	Past 2yr Rev CAG	EBITDA Margi	Target Description	Rationale	Extra
1/10/2022	TTWO	Zynga	M&A	$12.7	6.4x	27.8x	46%	16%	Owns hits like Words With Friends, FarmVille and Poker games.	Winning in mobile in a post-Apple's App Tracking Transparency requires massive scale powered by 1st party data (combined willl have 1B+ users to cross-promote content)	TTWO's famous series (Rockstar game brands, GTA, NB 2K, Red Dead, Borderlands) are not on mobile
6/23/2021	EA	Playdemic	M&A	$1.4	9.6x	15.2x	0%	63%	Made Golf Clash (80M dowloads)	Leverage EA's marketing and distribution strength to generate global reach	EA develops and publishes huge franchises like Madden NFL 21, Star Wars Jedi: Fallen Order, FIFA 21
3/23/2021	ByteDance	Moonton	M&A	$4.0	2.8x	9.0x	-4%	30%	Most famous in Southeast Asia for its Multiplayer Online Battle Arena (MOBA) game Mobile Legends	To expand into the video game business	Tencent lost the bid (along with Riot Games, they filed multiple lawsuits against Moonton since 2017 for what they say was copyright infringement)
2/8/2021	EA	Glu Mobile	M&A	$2.4	4.4x	82.8x	21%	5%	Handles numerous licensed games, particularly those based on reality TV shows and licensed Disney properties	Build on EA's network of 430M players (100M mobile MAUs) and expand to new audiences and demographics globally	EA has a portfolio of powerful IP in sports, lifestyle, RPG, casual and other genres
6/1/2020	Zynga	Peak	M&A	$1.8	--	--	--	--	2 Forever Franchises, Toon Blast, Toy Blast (top 10 US iPhone grossing games & 12M DAUs)	Add scale to Zynga's live services and driver of margin expansion	50% cash and 50% stock
6/21/2016	Tencent	Supercell	81.4% M&A	$8.6	4.3x	10.8x	86%	40%	Clash of Clans and Hay Day were top grossing Apple game apps in 137 and 96 country respectively. Sold at $10.2B valuation	Adding to its mobile games (Honour of Kings which generated $1.3B rev in 2015)	Tencent has a 48% stake in Epic Games (the developer of Fortnite, est. to earn $2.4B in 2018), minority stake in Krafton Game Union (publishes Fortnite's competitor, PUBG) and 5% ownership in blobkbuster studios Ubisoft (Assassin's Creed, Rainbow Six Siege) and ATVI
11/2/2015	ATVI	King Digital Entertainment	M&A	$5.9	3.0x	8.7x	3%	34%	330M MAUs, 200+ exclusive games in 196 countries	To be a leader across mobile, console, PC platforms	20% stock premium
		Average		**$5.8**	**5.1x**	**25.7x**	**25%**	**31%**			

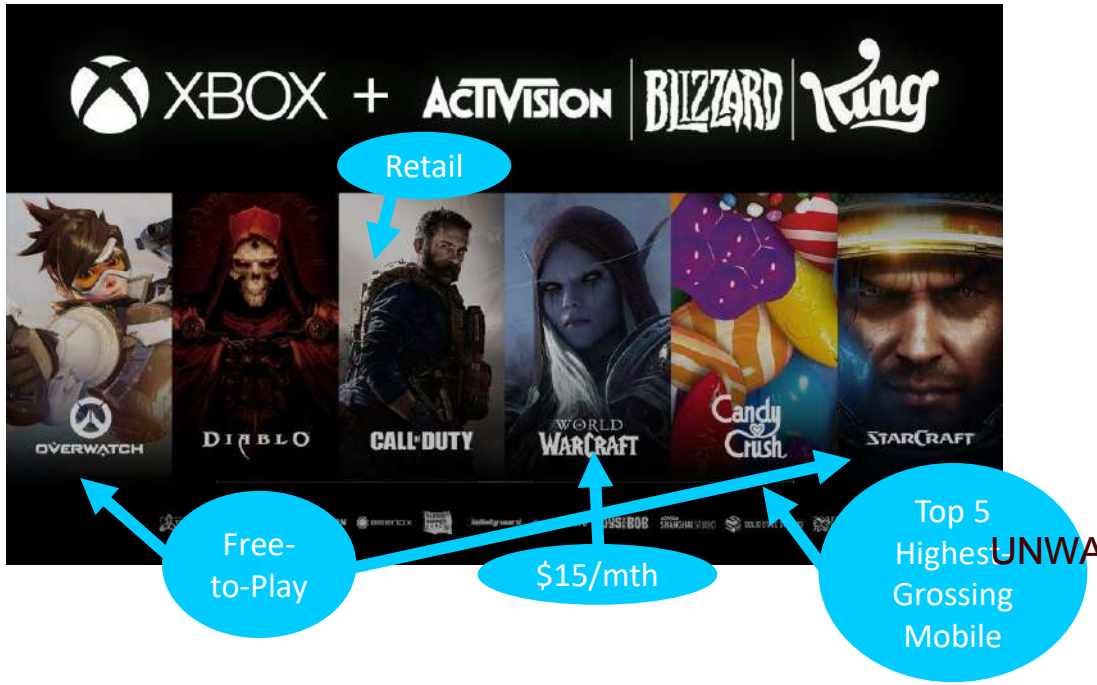
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6 Primary Contenders to Become the Next Dominant Gaming Platform

	Existing console installed base	Existing paid subscriber base	"Must-have" exclusive games	Existing 3rd party dev ecosystem	Gaming heritage / DNA	Global data center footprint
Sony Interactive Entertainment / PlayStation	94 million	36 million	✓	✓	✓	✗
Microsoft / XBOX	40 million	15 million	✗	✓	(✓)	✓
Nintendo / Nintendo Switch	32 million	8 million	✓	✗	✓	✗
Google / STADIA	✗	✗	✗	✗	✗	✓
Tencent 腾讯 / Tencent Games	✗	✗	(✓)	(✓)	✓	(✓)
amazon / TBA	✗	>100 million	✗	✗	✗	✓

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ATVI Fits in MSFT's Shift to Subscription Model (Device to a Player-Centric)



1

MSFT will bundle its titles to its Xbox Game Pass offering to make it more sticky

- M&A in pursuit of exclusives is usually value-destructive since it's giving up sales on other platforms
- MSFT pledged to keep releasing Call of Duty on Nintendo Switch for 10 years and on Steam
- PS Plus could fall as fans seek to get the title on Xbox consoles (ATVI games offered to be available on PS only until 2027)

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Announce Date	Buyer/ Investor	Target	Industry	Deal Type	Deal Size ($B)	Rev	EBITDA	Past 2yr Rev CAGR	EBITDA Margin	Target Description	Rationale	Extra
1/18/2022	MSFT	ATVI	Developer, Publisher, Distributor	M&A	$68.7	7.8x	19.9x	16%	39%	ATVI shares are down 30% since sexual harassment lawsuit	With $130B cash on hand, MSFT saw a valuable asset traving at a discount	At $77, the market is pricing in 81% that the deal will consumate
9/21/2020	MSFT	ZeniMax Media (owns Bethesda Softworks)	Publisher & Studio	M&A	$7.5	--	--	--	--	Publisher of The Elder Scrolls (series sold 20M+ copies, top-selling game of alll time), Doom and Fallout. Owns several studios globally.	Gives Xbox a much-needed infusion of titles and game developers (2x gaming content capacity)	To monetize the secular shift from a device to a player-centric era (powered by cloud gaming)

Addressing the Wholesale Transfer Pricing (Bargaining) Power of Developers

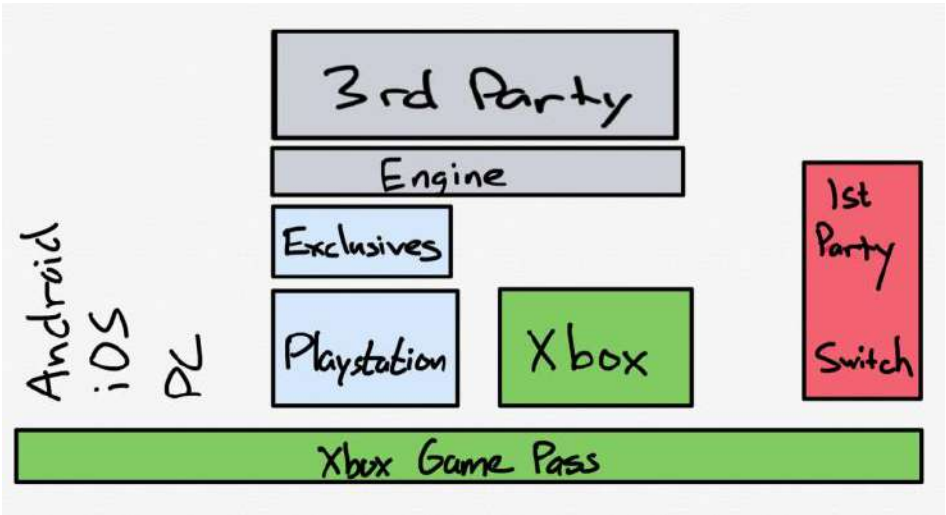
2

Addresses the tug of war over value between a distributor and content producer

- Adding 7 more studios to its roster, bringing its total up to 30



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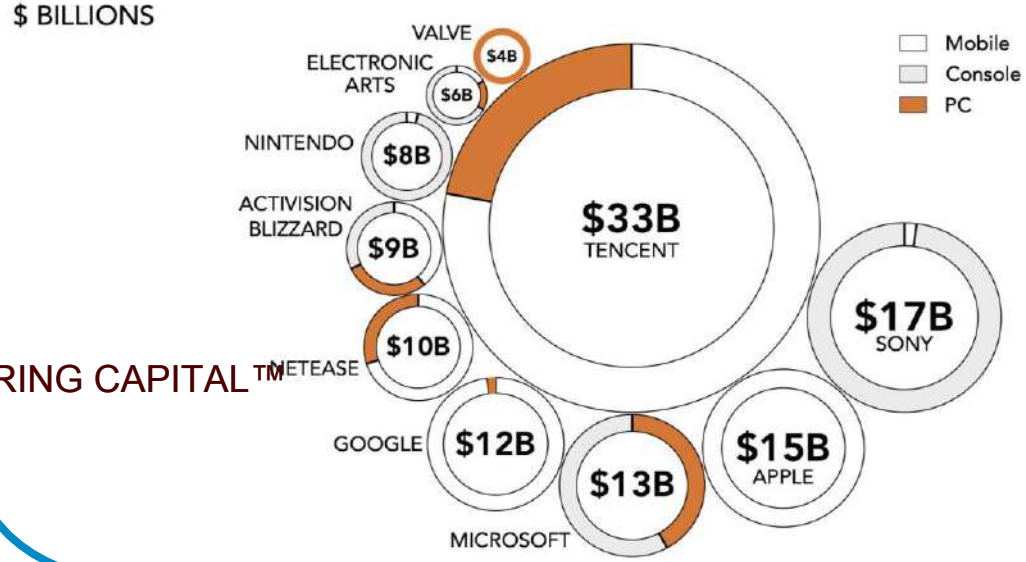
Announce Date	Buyer/ Investor	Target	Deal Type	Target Description	Rationale	Extra
2008-2022	NetEase	ATVI	Partnership *(Publishing Rights)*	Diablo 3, Hearthstone, Heroes of the Storm, Overwatch, StarCraft (all titles), WoW (7th highest-grossing PC game), Warcraft 3 suspended as they failed to negotiate a renewal. China is the world's #1 game market by revenue.	Required to have a Chinese publisher (takes months to a year for the regulators to issue a publishing license esp after multiple freezes).	Co-developed Diablo Immortal is covered by a separate agreement and won't be affected along with WoW: Dragonflight, Hearthstone: March of the Lich King, and season 2 of Overwatch 2

To Expand MSFT's Mobile Gaming and Even Perhaps its Ad Business

3

King's $2B annual revenue derived primarily from Candy Crush

- ATVI mostly failed to leverage King's expertise into becoming a mobile company – thus, I'm **dubious that MSFT will have success, especially as mobile gaming continues to consolidate**
- Adding Call of Duty to its existing presence in mobile via Minecraft
- Seeks to learn what people do on different screens



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Announce Date	Buyer/ Investor	Target	Industry	Deal Type	Deal Size ($B)	Rev	EBITDA	Past 2yr Rev CAGR	EBITDA Margin	Target Description	Rationale	Extra
11/2/2015	ATVI	King Digital Entertainment	Mobile Developer	M&A	$5.9	3.0x	8.7x	3%	34%	330M MAUs, 200+ exclusive games in 196 countries	To be a leader across mobile, console, PC platforms	20% stock premium
9/15/2014	MSFT	Mojang AB	Developer	M&A	$2.5	7.9x	18.1x	93%	43%	Miecraft sold 50M+ copies for PCs (38% of rev), smartphones and videogame consoles (30% of rev).	To lure people to MSFT's struggling Windows smartphone system	Through licensing deals, the game inspired top selling guide books for Scholastic, toys from Lego and feature film from Warner Bros

SIE Acquires a Lucrative Live GaaS expertise via Bungie M&A

Announce Date	Buyer/ Investee	Target	Seller	Deal Type	Deal Size ($B)	Target Description	Rationale	Extra
1/31/2022	SIE	Bungie	Netease, MSFT	M&A	$3.6	Destiny 2 is the most successful GaaS (live services games - selling a game and further monetizing with regular 'seasons' of content, new aesthetic updates, items), a lucrative new model for the industry	Furthering SIE's vision to reach billions of players by gaining access to its GaaS expertise, Destiny 3 and related multimedia (possible Netflix show)	Began as a Mac-focused but MSFT bought it to make Halo exclusive. AAPL shifted its gaming focus with App Store instead.
2010-2018	ATVI	Bungie	--	Partnership *(Exclusive Publishing Rights to Destiny)*	$0.5	10 year agreement to access an established publisher to launch Bungie's game of that magnitude (50M+ games delivereed, 10M+ 'Guardians' players). ATVI had rights for 4 MMO (Massively Multiplayer Online) entries in the Destiny series.	To pursue the "it's ready when it's ready" philosophy that companies like Rockstar have the luxury of	Bungie failed to meet its deadline of releasing a new game every 2 year and the pressure contributed to the berated microtransaction store built into Destiny 2 (underperformance led to 7% YoY rev growth for ATVI in 3Q18) and half-baked nature of Curse of Osiris
6/3/2018	NetEase	Bungie	--	Investment	$0.1	Reportedly working on First-Person Shooter (FPS) mobile game together	Bungie hopes to move beyond the confines of its ATVI deal	NetEase releases most of ATVI's games in China. So far, it has only made a couple of mobile & PC games.
10/5/2007	--	Bungie	Microsoft	Splitoff	--	Halo became Xbox's flagship franchise and MSFT will retain the brand (made $300M+ in sales of Halo 3).	Bungie criticized MSFT's destruction of its culture as it had with the now-defunct FASA Studio (public company's earnings pressure likely hampered Bungie's freedom to try new game concepts)	MSFT retains the Halo brand and minority stake in Bungie. Its games will no longer be exclusive. for Windows PC and Xbox 360
6/19/2000	MSFT	Bungie	TTWO (20% equity)	M&A	*$0.03*	Long-time partner of SIE. Owns franchises including Marathon, Destiny	Gain exclusive publishing and distribution rights to select titles (Halo)	TTWO acquired right, title and interest to Myth and Oni game properties

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Bungie to SIE

- Live Services Expertise to PlayStation Studios
- Help Build SIE Live Services Center of Excellence
- Live Services Business Operations to Platform Business

SIE to Bungie

- Leverage Scale of SIE Publishing & Platform (Marketing, Global Business Operations)
- PlayStation Studios Central Services
- G&A Support (Legal, Finance, Accounting, HR)

SIE is well positioned for Metaverse (Gaming has been its Frontier for Decades)

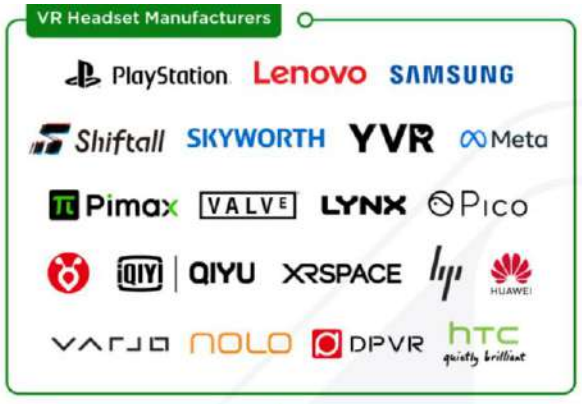
Announce Date	Buyer/ Investor	Target	Industry	Deal Type	Deal Size ($B)	Target Description	Rationale	Extra
4/11/2022	SIE	Epic Games	Developer and Pubisher	Investment	$1.0	Maker of battle-roytale title Fortniate and the widely used Unreal Engine (a leading platform used to create games), increasingly employed for film, TV and streaming video virtual productions as well as for creating games and VR/Metaverse experiences	VR game revenue in 2022 was $1.8B. Comes after Epic and Lego announced co-development/partnership of a family-friendly metaverse for kids	Values Epic at $31.5B. Invested alongside Lego family (Kirkbi) which also invested $1B.



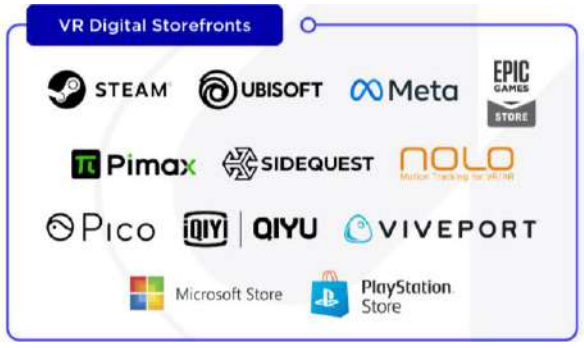
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Leading In-House Game Studios

Date	Buyer/ Investor	Target	Industry	Deal Type	Target Description	Rationale	Extra
8/29/2022	SIE	Savage Game Studios	Mobile Game Developer	M&A	Makes action games with epic stories. Now working on unannounced new AAA mobile live service action game	Moving into mobile, PC and live service games to reach new audiences unfamiliar with PlayStation and provide more ways to engage with its content	Savage is joining a newly created PlayStation Studios Mobile division, which will operate independently from
5/3/2022	SIE, Softbank Vision Fund, Galaxy Interactive, NetEase	AccelByte	Backend Services for Game Developers	Series B VC	Founded by former engineering team at Epic Games. Current cleints include Dreamhaven, Build A Rocket Boy, 1047 Games, KRAFTON, Deep Silver Volition, Theorycraft Games, Remedy Entertainment, Remedy Entertainment, Raid Base, and Starbreeze Studios	SIE's continued interest in AAA-quality live service game. In 2018, MSFT bought PlayFab and AMZN bought GameSparks to bolster their game infrastructure platofrm businesses.	"Unlike competitors PlayFab and GameSparks, AccelByte's microservice is fully customizable, extensible and massively scale to millions of players"
11/5/2021	SIE	Devolver Digital	Publisher	5% Stake Investment	Rose to prominence with games such as Hotline Miami and Shadow Warrior.	Notable publisher with Inscryption, Loop Hero and Death's Door and ucpoming Weird West	Indie publisher IPO on London Stock Exchange, at $950M. NetEase also bought
9/8/2021	SIE	Firesprite	VR Game Developer	M&A	Behind "The Playroom VR", Vita, mobile title "Run Sackboy!Run!" (all of the studio's games have had a VR	It worked with Sony on a collection of AR mini-games designed to show off the PlayStation Camera's capabilities	Firesprite will be the 14th studio (recently acquired Returnal developer
7/1/2021	SIE	Nixxes	Game Studio	M&A	Diutch developer with 20+ years of experience	To help the pbulisher port more PlayStation games to PC as it continues to examine the growing multiplatform	Have already seen Days Gone and Horizon Zero Dawn come to PC and Unchartered

Top 15 selling PS4 games of all time (ranked by units sold)

Title	Year	Publisher
Grand Theft Auto V	2014	Take Two
Call of Duty: Black Ops 3	2015	Activision
Uncharted (PS4)	2016	Sony Interactive
Red Dead Redemption 2	2018	Take Two
Call of Duty: WWII	2017	Activision
FIFA 18	2017	Electronic Arts
The Last of Us	2014	Sony Interactive
FIFA 17	2016	Electronic Arts
God of War (PS4)	2018	Sony Interactive
Horizon: Zero Dawn	2017	Sony Interactive
Spider-Man (PS4)	2018	Sony Interactive
Call of Duty: Infinite Warfare	2016	Activision
Fallout 4	2015	Bethesda Softworks
FIFA 16	2015	Electronic Arts
Star Wars Battlefront (2015)	2015	Electronic Arts

Source: VGChartz; company disclosure

Studio	Key franchises	Estimated units sold (mm)
Naughty Dog	• The Last of Us • Uncharted	• The Last of Us (2013): 19mm • Uncharted 4 (2016): 15mm • Uncharted 3 (2011): 6mm
Santa Monica Studio	• God of War	• God of War (2018): 12mm
Kojima Productions	• Death Stranding	• To be released in Nov 2019
Sucker Punch	• Infamous • Ghost of Tsushima	• Infamous Second Son (2014): 6mm • Ghost of Tsushima to be released in '19
Guerrilla	• Horizon Zero Dawn	• Horizon Zero Dawn (2017): 10mm
Polyphony Digital	• Gran Turismo	• Gran Turismo Sport (2017): 8mm • Gran Turismo 6 (2013): 5mm
Bend Studio	• Days Gone	• Released in April 2019
San Diego Studio	• MLB: The Show	• ~1-2mm units per year
JAPAN Studio	• The Last Guardian • Bloodborne • Everybody's Golf	• Bloodborne (2015): 3mm • The Last Guardian (2016): ~1-2mm • Everybody's Golf (2017): ~1-2mm

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Live Nation Entertainment (NYSE:LYV)

Company Description

Live Nation Entertainment, Inc. operates as a vertically integrated live entertainment business with four business segments;

1) talent management
2) concerts and events
3) ticket distribution via Ticketmaster (primary and secondary/"scalping" markets)
4) sponsorship (advertising)

Opportunity

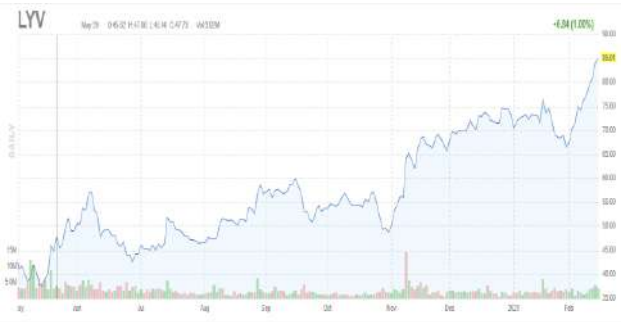
Opportunity to long **Live Nation Entertainment** (NYSE:LYV) with a targeted price of $933 (27% IRR), led by:
(a) impenetrable moat that has a monopoly-like structure, (b) secondary market exploitation, and (c) growth opportunity through acquisitions and geographic expansion

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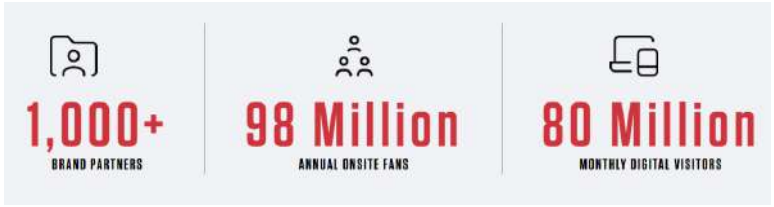
Key financials

Share price	85.01
Market Cap (mm)	18,142.6
Shares Out. (mm)	213.4
Float %	66.8%
Diluted EPS Excl. Extra Items	(6.97)
Avg 3M Dly Vlm (mm)	2.45
Beta 5Y	1.38
Total Revenue	4,513.2
AOI	(862.6)
EBIT	(1,319.7)
Net Income	(1,441.2)





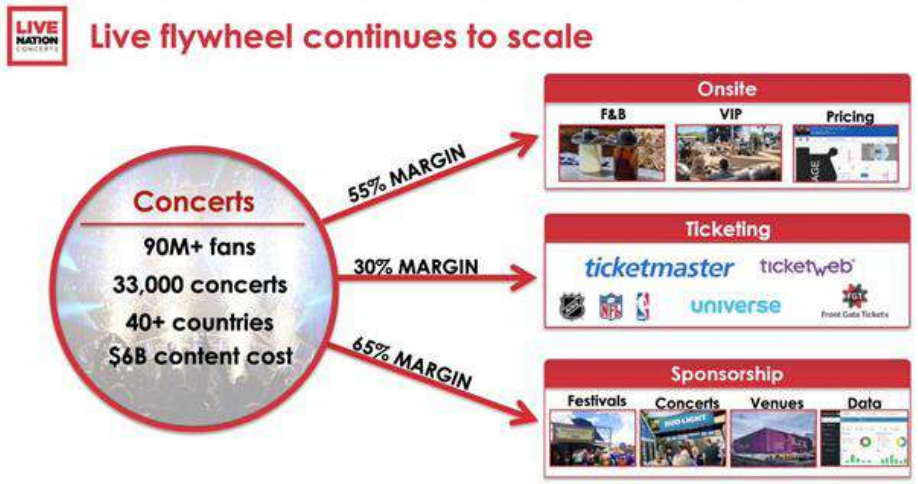
Live Nation has durable competitive advantages in the Promotional Market with unparalleled Economies of Scale coupled with Customer Captivity







Live Nation's steady 19% market share of US Concert and Events Promotion substantiates the existence of **moat**



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Sponsorships & Advertising	Ticketing	Concerts & Events
- **5% of Revenue:** $590M - **34% of AOI:** $366M	- **13% of revenue:** $1,545M - **44% of AOI:** $482M	- **82% of Revenue:** $9,428 M - **22% of AOI:** $242M

Products & Services Segmentation



T1 Market is significantly under-modeling LYV's TAM and underappreciating the magnitude of Industry Tailwinds

$1.1T Global Events Market (*2019*) **is expected to reach $1.6T by 2028 at a CAGR of 11%** (*from 2021 to 2028*)

Investors are only incorporating music, festivals, and sports

- ✓ But LYV's ticketing and live events promotion can easily penetrate conferences, exhibitions, corporate events, seminars, fundraising, art performances, trade shows, and product launches

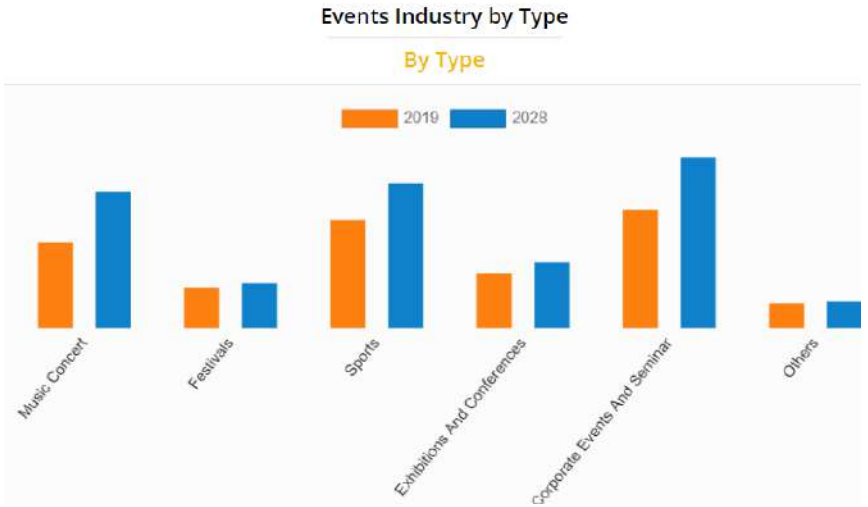
LYV is a Dominant Incumbent in a Highly Fragmented Market

- ✓ LYV and AEG captures 19% and 5% of US market and the rest are minor players that are currently being sold at distressed levels due to COVID-19
- ✓ 89% of these incumbents compete in highly localized regional markets
- ✓ US market is projected to grow at 17% CAGR from 2021 to 2026, largely driven by increase in disposable income and people's strong desire to connect with others in live events

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Numerous Industry Tailwinds and Strong Positioning

- ✓ $2.4T projected surplus in US savings in June 2020, a key indicator of consumer spending potential
- ✓ 2x as many major touring artists on cycle in 2022 than a typical year (45 artists vs. the usual 25)
- ✓ Our primary research indicates that 2/3+ of venues are unused, indicating lower costs to borrow arenas and stadiums
- ✓ Our surveys demonstrate that 95% of fans are likely to attend a show when restrictions are lifted



T1 Growth through acquisitions and geographic expansion throughout Europe and Asia

The company has become what it is largely through bolt-ons and acquisitions in a fragmented space that benefits from scale.

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Acquired a majority stake in Veeps

- Live Nation has acquired a majority stake in Veeps, a leading livestream concert platform for the music industry. The platform allows fans to purchase tickets and watch live concerts from the comfort of their homes.

Ticketmaster expanding into Asia

- Ticketmaster, a Live Nation Entertainment company, has announced it will be expanding into Asia, by acquiring Tixcraft in Taiwan.

Acquired a controlling interest in PR Worldwide

- Live Nation has acquired a controlling interest in the live entertainment division of PR Worldwide, one of Malaysia's leading live events promoters.

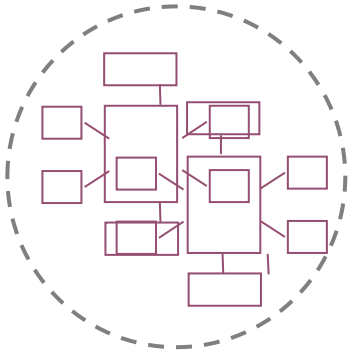
Acquired a controlling interest in OCESA

- Live Nation has entered into definitive agreements to acquire a controlling interest in OCESA Entretenimiento, a leading promoter in Latin America and owner of Ticketmaster Mexico from CIE and Grupo Televisa.

T2 Ticket Master's successful foray into the Secondary Market will refute Bears' Thesis and enabling

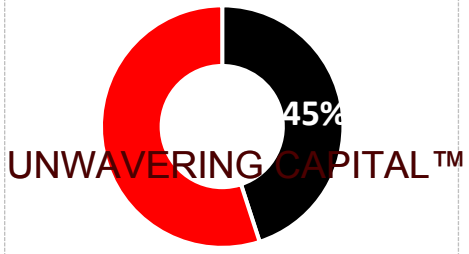
The secondary market over time will tend to merge with the primary market (gap will shrink, albeit not entirely). The secondary market exists primarily because of initial pricing inefficiency by the content.

Highly fragmented market



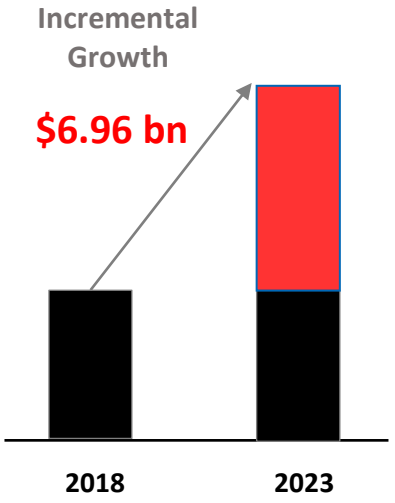
- The market is highly fragmented with several players occupying the market share
- One of the key drivers for this market will be the growth in online secondary ticketing platforms

45% of the growth will come from North America



- China to reach a projected market size of US$12.7 Billion by 2027 trailing a CAGR of 5.9% over 2020 to 2027 period.
- Japan and Canada to grow at 0.9% and 2.4% respectively.
- Within Europe, Germany is forecast to grow at approximately 1.6% CAGR.

Incremental growth of $6.96 bn expected by 2023

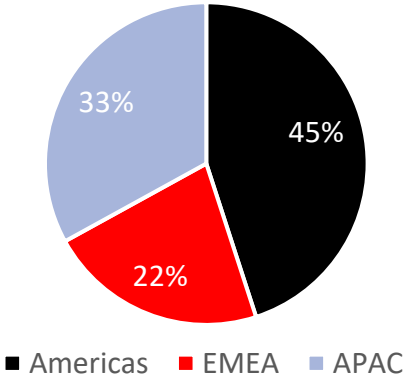


- The market will be accelerating at a CAGR of almost 9%

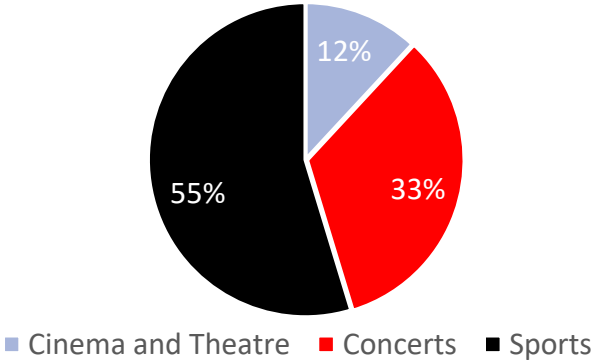
T2 Ticket Master's successful foray into the Secondary Market will refute Bears' Thesis and enabling

Nearly 40% of seats remain "unsold" as they are diverted to the secondary market, to the likes of StubHub. LYV is expanding into this space by managing the digital ticket and making it more difficult to transfer the barcode.

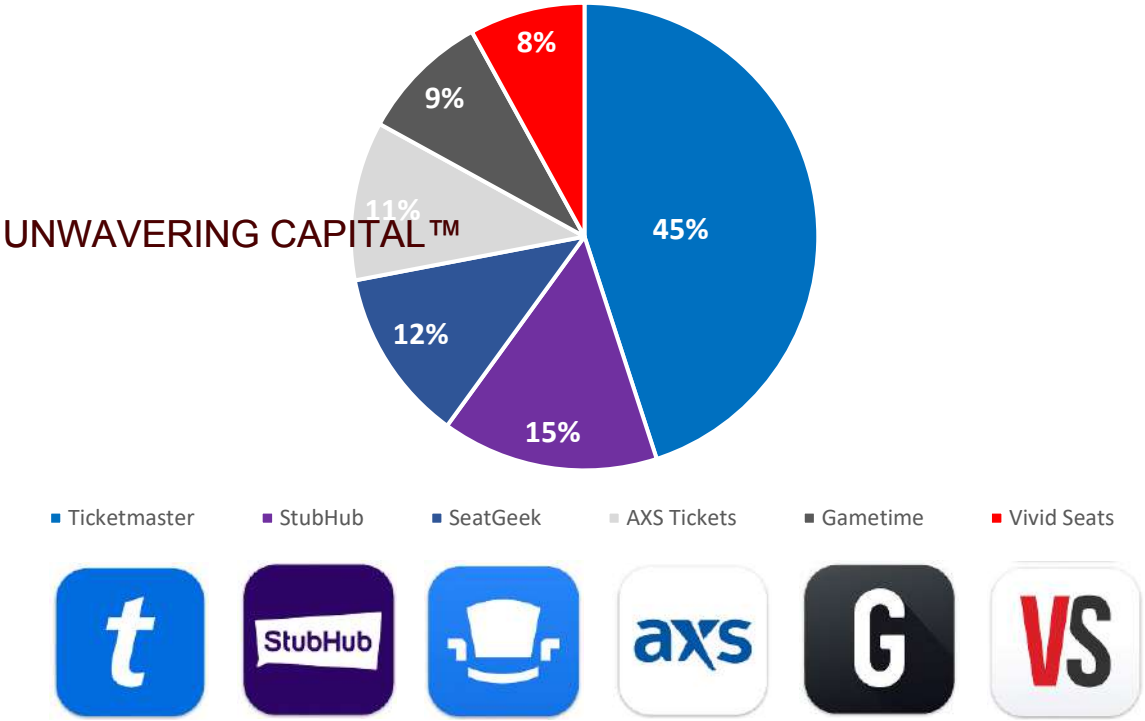
By Geography



By Segment



Ticketing App Download Market Share



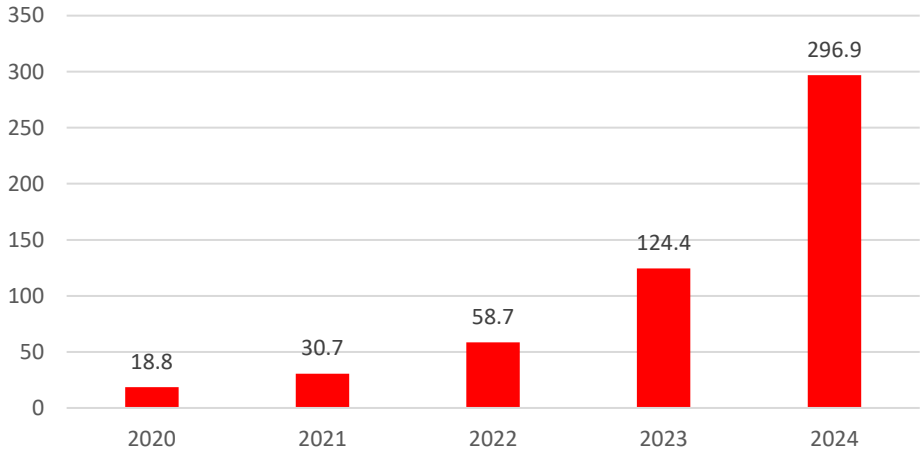
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T3 Live Nation unveiling customizable augmented reality products, unlocking more immersive ways to connect with artists and brands at live music events



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Augmented reality (AR) and virtual reality (VR) market size worldwide (billion USD)



Suite of AR products in development

AR Livestream

a three-dimensional, four-sided viewer to view selected performances – live from the festival.

AR VIP Access

experience distinctive vantage points from Music Midtown that are typically reserved exclusively for industry insiders.

AR Fest Lens

a lineup will appear identifying which artists will be performing, as well as upcoming acts, ensuring fans never miss their favorite artists.

AR Intermission

creatively reimagine what the stage can look like in between sets, creating memorable, engaging entertainment experiences.

AR Photo Opp

unique AR filters complete with custom 3D artwork that effectively blend the digital and physical worlds.

R1 Covenant risk is one of the Key Investment Factors: John Malone's precedents and primary research with bankers/customers refute the short thesis

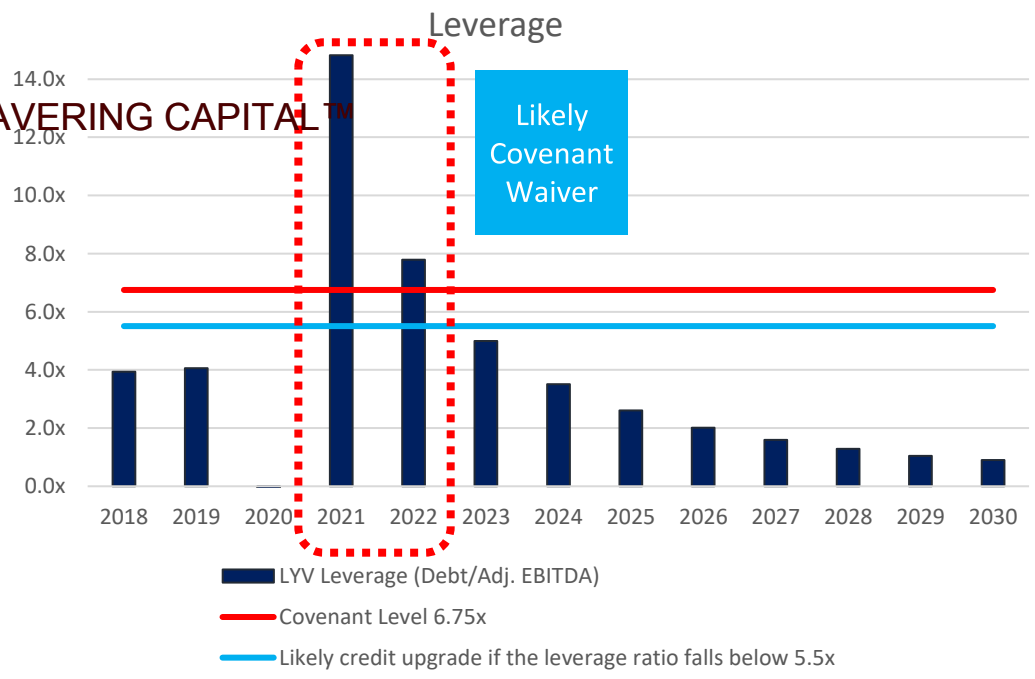
	12/31/2020	12/31/2019
Cash and cash equivalents	$2,546	$641
Sum of CF		
Event related deferred revenue of up to $250M		
Senior Secured Credit Facility		
Term Loan B	938,125	947,625
6.5% Senior Secured Notes due 2027	1,200,000	--
4.75% Senior Notes due 2027	950,000	950,000
4.875% Senior Notes due 2024	575,000	575,000
5.625% Senior Notes due 2026	300,000	300,000
2.5% Convertible Senior Notes due 2023	550,000	550,000
2.0% Convertible Senior Notes due 2025	400,000	--
3.75% Senior Secured Debt due Jan 15 2028		
Other LT Debt	125,226	80,642
Total Principal Amount	**5,038,351**	**3,403,267**
Less: unamortized discounts and debt issuance costs	(129,840)	(94,210)
Total LT debt, net of unamortized discounts/debt issuance costs	**4,908,511**	**3,309,057**
Less: current portion	53,415	37,795
Total long-term debt, net	4,855,096	3,271,262
Net Leverage Ratio (adj. debt/EBITDA)		
Maturity schedule		
2021	53,415	53,415
2022	573,897	573,897
2023	38,604	38,604
2024	989,824	989,824
2025	36,359	36,359
Thereafter	3,346,252	3,346,252
Total	**$5,038,351**	**$5,038,351**

Mitigants

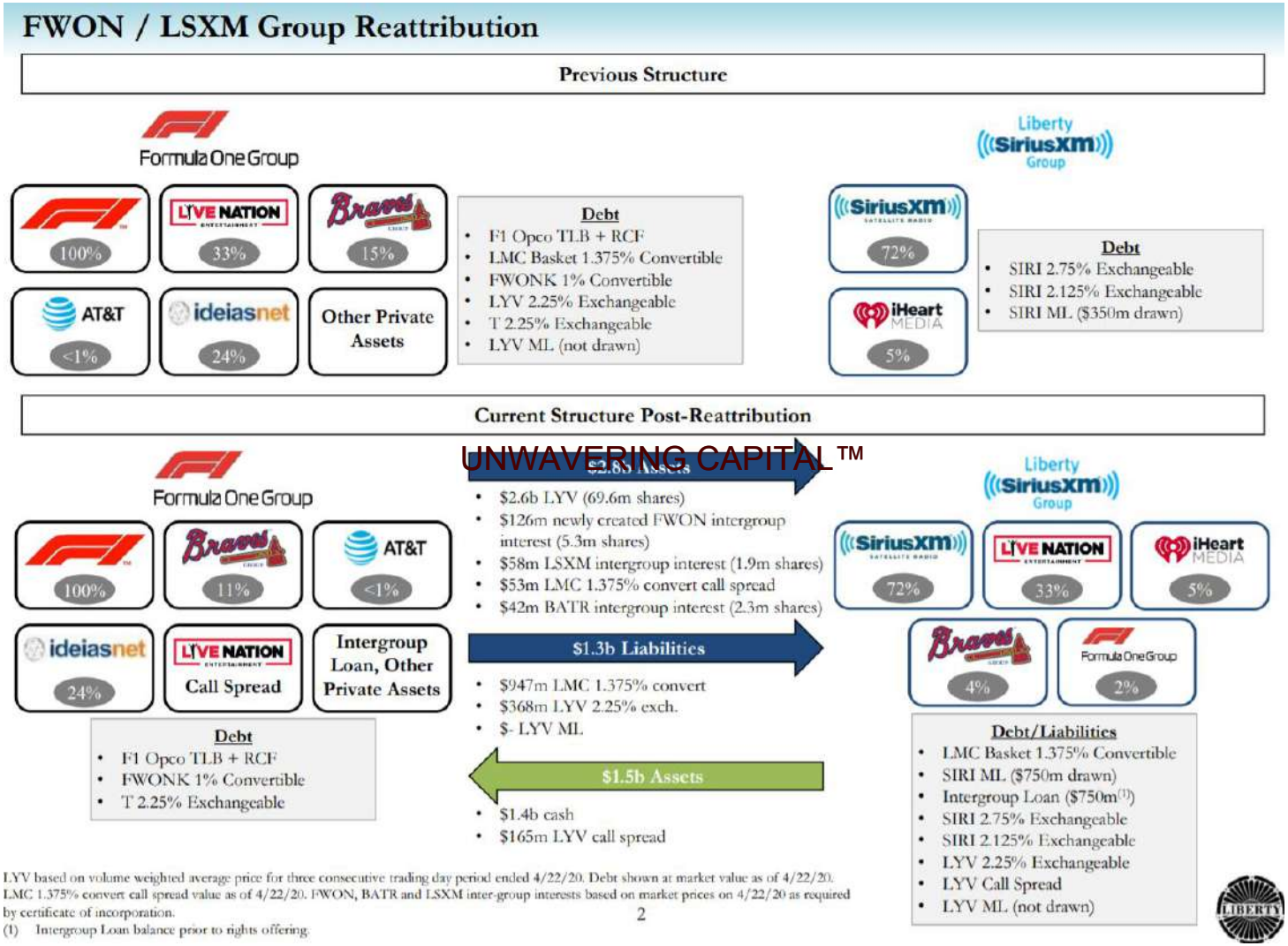
$2.5B of cash and **$1.2B of available debt capacity** that would carry LYV through **1.5+ year of revenue-free** at the current rate of cash burn

It **would take a complete shutdown until the spring of 2022** to run the cash reserves and untapped debt sources dry

It **would take a complete shutdown until the spring of 2022** to run the cash reserves and untapped debt sources dry



R1 Covenant risk is one of the Key Investment Factors: John Malone's precedents and primary research with bankers/customers refute the short thesis



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Valuation

DCF ANALSIS

	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	Terminal
EBIT	322	(1,653)	(143)	88	380	732	1,148	1,631	2,197	2,862	3,644	4,289	4,439
Less: Taxes	(55)	281	24	(15)	(65)	(124)	(195)	(277)	(374)	(487)	(619)	(729)	(755)
Add: D&A	444	485	408	466	520	576	634	694	760	834	917	1,011	1,046
Less: Capex	(366)	(223)	(221)	(252)	(281)	(311)	(343)	(375)	(411)	(451)	(496)	(546)	(566)
Less: Working Capital	(33)	(38)	(42)	(47)	(51)	(56)	(62)	(68)	(74)	(82)	0	0	0
Equals: UFCF	**312**	**(1,148)**	**26**	**241**	**503**	**816**	**1,183**	**1,605**	**2,098**	**2,677**	**3,445**	**4,024**	**4,165**
Cost of Capital	6.14%	6.14%	6.14%	6.14%	6.14%	6.14%	6.14%	6.14%	6.14%	6.14%	6.14%	6.14%	
Cumulated Cost of Capital	1.00	1.06	1.13	1.20	1.27	1.35	1.43	1.52	1.61	1.71	1.81	1.93	
Present Value: UFCF	312	-1,081	23	201	396	606	827	1,058	1,303	1,566	1,899	2,090	
Present Value: Terminal Value	82,018	87,051	92,394	98,065	104,083	110,471	117,251	124,448	132,085	140,192	148,796	157,928	
NPV of Remaining Annual FCF	8,888	10,582	11,205	11,652	11,864	11,776	11,316	10,406	8,946	6,819	3,792	0	*37.9x*
Total Firm Value	**90,906**	**97,633**	**103,599**	**109,716**	**115,948**	**122,248**	**128,568**	**134,854**	**141,032**	**147,011**	**152,588**	**157,928**	
Multiple of Trailing EBITDA	*111.6x*	*-92.8x*	*312.9x*	*174.1x*	*117.8x*	*87.2x*	*68.2x*	*55.3x*	*45.8x*	*38.4x*	*32.4x*	*28.9x*	
Multiple of Fwd EBITDA	*-86.5x*	*294.9x*	*164.4x*	*111.5x*	*82.7x*	*64.8x*	*52.8x*	*43.8x*	*36.8x*	*31.2x*	*27.9x*	--	
YE Net Debt	835	2,362	-4,181	-8,454	-10,374	-12,680	-15,466	-18,751	-22,756	-27,601	-33,427	-40,167	
Value of Equity	**90,071**	**95,271**	**107,780**	**118,170**	**126,321**	**134,928**	**144,034**	**153,605**	**163,788**	**174,612**	**186,015**	**198,096**	
FDS	210	212	212	212	212	212	212	212	212	212	212	212	
DCF PT	--	--	**507.36**	**556.27**	**594.64**	**635.16**	**678.02**	**723.08**	**771.01**	**821.97**	**875.64**	**932.51**	
% Upside / (Downside)			**476%**	**532%**	**575%**	**621%**	**670%**	**721%**	**775%**	**833%**	**894%**	**959%**	

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Assumptions	
Cost of Debt	5.00%
Risk Free Rate	1.67%
Market Risk Premium	11.00%
Beta	1.58
Cost of Equity	19.1%
Terminal Growth Rate	3.5%
Debt / Total Capital	86.7%
ETR	17.0%
WACC	**6.14%**

Return on Capital												
NOPAT	**267**	**(1,372)**	**(119)**	**73**	**315**	**608**	**953**	**1,354**	**1,824**	**2,376**	**3,024**	**3,560**
Equity	*1,146*	*(472)*	*(1,224)*	*(883)*	*(634)*	*(104)*	*810*	*2,132*	*3,934*	*6,300*	*9,327*	*12,914*
Debt	*9,512*	*10,723*	*22,766*	*29,040*	*31,467*	*34,015*	*36,668*	*39,410*	*42,489*	*45,955*	*49,870*	*54,292*
Invested Capital	**10,657**	**10,251**	**21,542**	**28,157**	**30,833**	**33,912**	**37,478**	**41,542**	**46,423**	**52,255**	**59,197**	**67,206**
ROIC	**2.5%**	**-13.4%**	**-0.6%**	**0.3%**	**1.0%**	**1.8%**	**2.5%**	**3.3%**	**3.9%**	**4.5%**	**5.1%**	**5.3%**

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
ROIC	-0.5%	-0.9%	0.4%	-0.5%	13.6%	2.7%	-5.5%	1.2%	-1.0%	2.4%	1.9%	-15.9%	-0.6%	0.3%	1.0%	1.8%	2.5%	3.3%	3.9%	4.5%	5.1%	5.3%
EVA	-$151M	-$355M	-$283M	-$339M	$413M	-$201M	-$691M	-$320M	-$520M	-$312M	-$449M	-$2,257M	-$1,441M	-$1,655M	-$1,577M	-$1,474M	-$1,347M	-$1,196M	-$1,025M	-$831M	-$609M	-$565M
ROE	-9.3%	-16.8%	-5.7%	-12.2%	-3.2%	-7.5%	-5.4%	-4.2%	-8.3%	-1.7%	-0.5%	365.5%	18.9%	45.5%	0.9%	-257.8%	100.1%	56.7%	42.7%	35.4%	30.9%	26.5%
ROCE	-0.7%	-1.1%	0.7%	-0.6%	3.1%	3.7%	3.2%	4.5%	2.3%	5.9%	4.7%	-24.3%	-2.4%	1.4%	5.7%	10.2%	14.1%	17.1%	19.2%	20.5%	21.2%	20.5%

Weaker negotiating power for LYV

Along with the changes in industry landscape, Live Nation is losing its negotiating power it enjoyed over the past years

Shifting negotiating power

Ticketmaster typically has an upper hand in negotiating with venues	▪ Regardless of the owner of the venue, most major venues have an agreement with companies such as Ticketmaster to provide primary ticket sale distribution services. ▪ Contracts are typically exclusive and last between three to six years. ▪ Ticketmaster typically has an upper hand in negotiating with venues, as it also controls access to the talent. ▪ If the firm declines to use Ticketmaster, then LYV can take its talent to an alternative venue. ▪ This contractual moat is compounded by Live Nation's frequent practice of installing its own hardware at the venue, using proprietary software to process tickets.
Consolidation in the venue space gives venues more negotiating power	▪ An important example of shifting power in venue is the merger of AEG and SMG, which manage 300 venues including NFL stadiums, NBA arenas and convention centers. ▪ This shifts negotiation power from Live Nation and may continue. ▪ In terms of talent acquisition, big talent may have the upper-hand in negotiations, prompting LYV to overpay.

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Risk of new/incremental regulatory pressure on business model

As Live Nation operates a vertically integrated monopolistic-like system, the company has often been scrutinized by regulators

Regulatory and legal challenges

Federal legal action over ticketing practices	▪ The U.S. Department of Justice take on LYV over allegations that it coerced concert venues into working with its Ticketmaster division.
Competitors' legal battle with Live Nation.	▪ The online ticket-selling start-up Songkick in 2015 filed a David-and-Goliath antitrust lawsuit against Live Nation, saying Ticketmaster has used its clout to try to "destroy competition" in the artist presale market. ▪ The parties settled the dispute in 2018, in a deal that resulted in Live Nation buying some of Songkick's assets. ▪ In 2014, Ticketmaster agreed to issue $400 million in credits to ticket buyers to settle a class-action lawsuit over processing fees.

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Mitigants

Paramount Consent Decrees

- The Paramount Consent Decrees are officially over as a New York federal judge granted a motion by the U.S. Department of Justice to terminate the movie industry's long-lasting licensing rules.

#1 Covenant risk is one of the Key Investment Factors: John Malone's precedent deals and primary research with bankers/customers refute the short thesis

Liquidity and cash burn

Leverage Ratio	▪ 2.1x net debt/AOI and 14
Interest expense	▪ $140 million ▪ The company has $2.5 billion of cash and $1.2 billion of additional credit facilities.
Extreme Case	▪ Assuming the company doesn't generate revenue through 2020 and the first quarter is net-net in terms of spend relative to generated revenue, the company will have a cash burn of $3.7 billion. ▪ The company currently has cash on hand of $2.5 billion and access to a $1.2 billion debt facility. ▪ Live Nation will need to cut selling, general and administrative expenses (SG&A) aggressively (bonuses, layoffs, some lease payments, etc.). We assume 20% cuts in SG&A.

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Mitigants

$2.5B of cash and **$1.2B of additional Credit Facilities** that would carry LYV through **1.5+ year of revenue-free** at the current rate of cash burn

It **would take a complete shutdown until the spring of 2022** to run the cash reserves and untapped debt sources dry.

That's highly unlikely now that we have several COVID-19 vaccines either approved or close to emergency approval.



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NYSE: NOK

THESIS & RISK

THESIS

1) Industry tailwinds offset headwinds

2) NOK's TAM is vastly undervalued

3) Continued pressure on Huawei by the US

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RISKS

1) 5G RAN share loss at Verizon to Samsung

2) Increasing competition (O-RAN & V-RAN)

3) ERIC is 8 months ahead of NOK in key tech

NOK'S SEGMENTS: REPORTABLE SEGMENTS

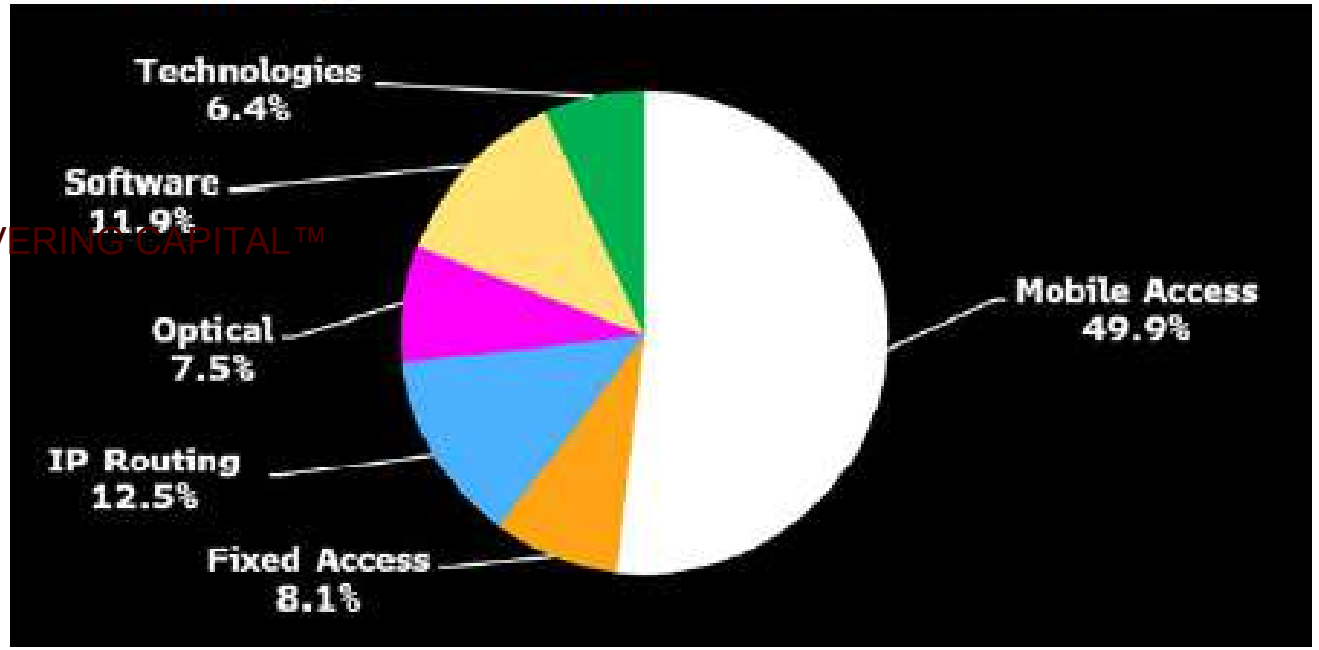
System Integrator's Market Positioning: *Be one stop shop, providing end-to-end solutions*

1) Software: **- Applications** spanning customer experience mgmt, network operations/management, communications and collaboration, policy and charging

-**Cloud, IoT, security, & analytics platforms** that enable digital services providers to monetize, innovate, and optimize

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Nokia Segments Share of 2019 Revenue

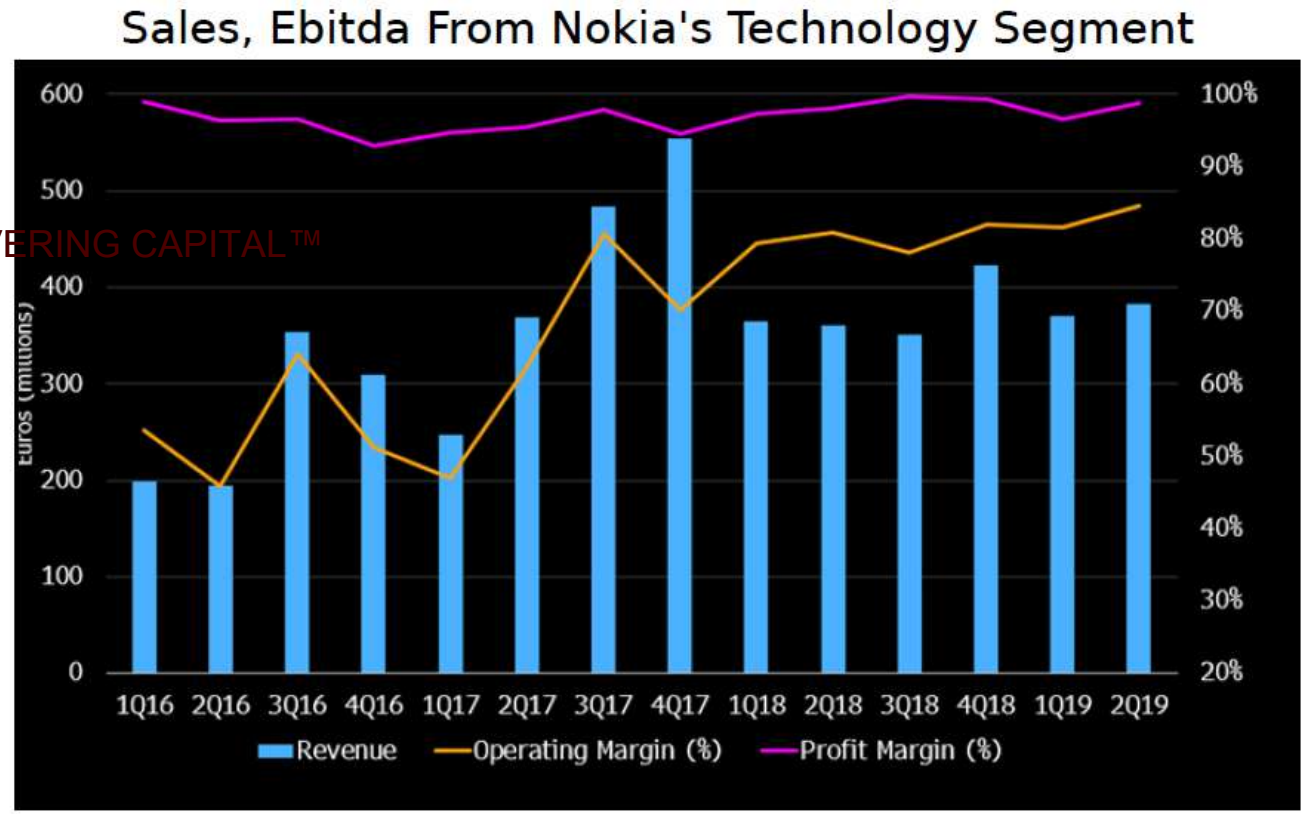


NOK'S SEGMENTS: 2) TECHNOLOGIES

*Despite contributing only 6% of total revenue, the segment contributed **46% of total EBITDA in 2019 and had a gross margin of 98%***

- **Patent licensing:** Portfolio of ~20k patents, about 3% of which cover wireless interoperability *(i.e. work across disparate devices of other companies)* standards, contributes most heavily to the segment
- Most of NOK's **licensing (technology, brand, and patent)** are long term. As a result, it's recurring and predictable even during COVID headwinds
- Built on decades of innovation and R&D leadership in technologies used in virtually all mobile devices used today

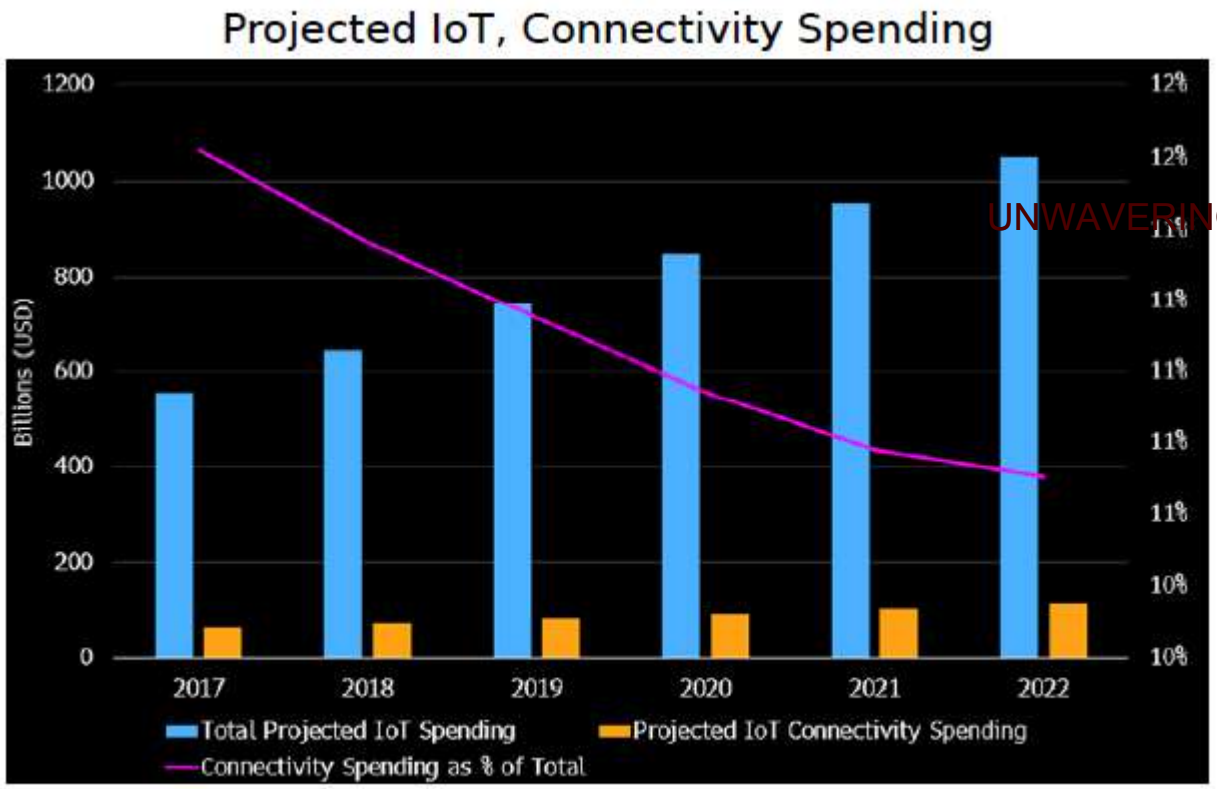
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Source: Company Filings, Bloomberg Intelligence

NOK'S SEGMENTS: 2) TECHNOLOGIES

Auto sector is Nokia's one of the many 1st Vertical Licensing Opportunities



Source: IDC

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- **NOK positioned to license technology in emerging connected-device markets:** IDC estimates total IoT's connectivity spending could top $100B by 2021
- $3 a vehicle for basic connectivity, $9 for 2G/3G technology, and $15 for 5G
- **Recent litigation win**, which confirms such licensing practice to be consistent with US antitrust law, make the pricing of immediate 5G prospects (automotive applications, set-top boxes and smart meters) to be at the high end

NOK'S SEGMENTS: 3) NETWORKS

1. Mobile Networks:

Mobile radio macro base stations, small cells, cloud-based solutions, microwave radio links, cloud computing HW

2. Global Services:

with **multi-vendor capabilities**, covering network planning/optimization/ implementation, systems integration, company-wide managed services

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3. Fixed Access

Provides **fiber access products, solutions, and services** as well as customized technologies that bring fiber to the most economical point for the customer

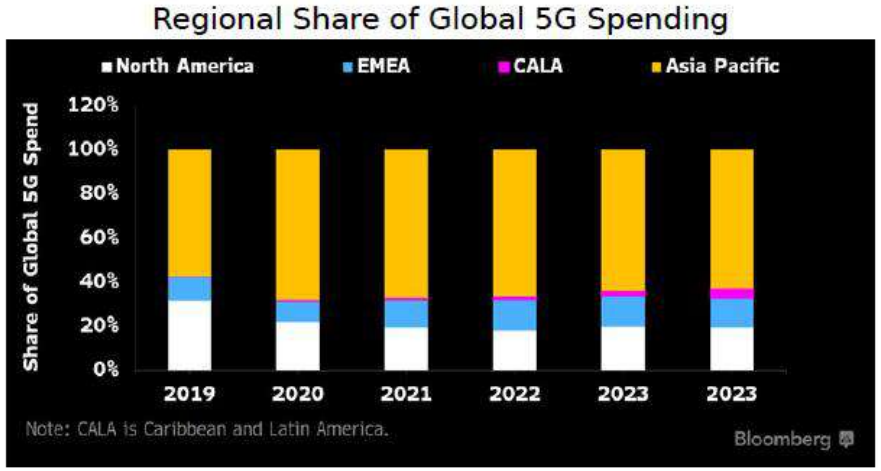
4. IP Routing/Optical Networks

Packet core and optical transport system, each with their own software/services to build **high-capacity network infrastructure for the internet and global connectivity**

NOK'S MISSTEPS IN CHINA PRICED IN

NOK'S LATE ENTRY WITH A COST-EFFICIENT DESIGN EDGED IT OUT OF THE WORLD'S LARGET 5G MARKET, CHINA, LED TO COMPETITIVE DISPLACEMENT AT VERIZON



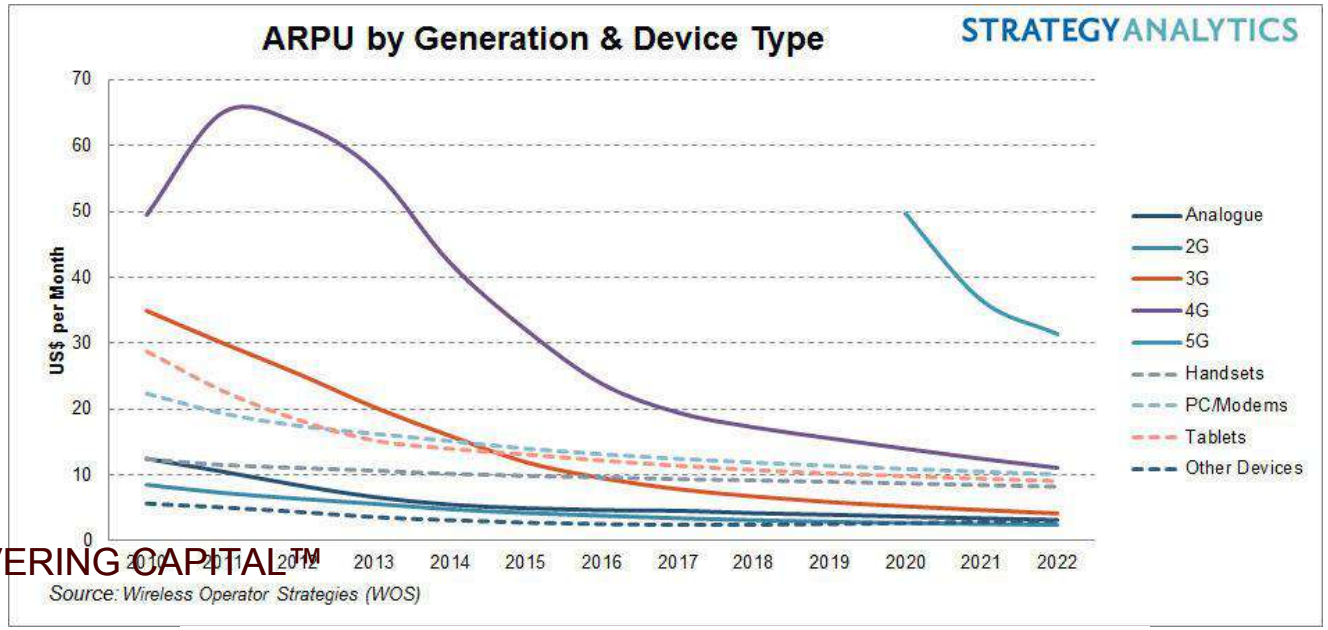


Source: IHS



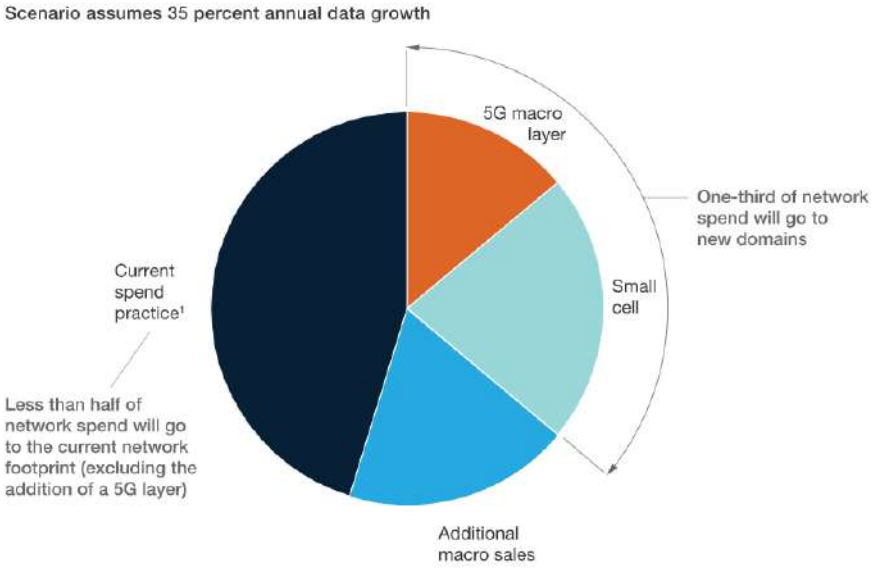
THESIS 1 – INDUSTRY TAILWINDS OFFSET HEADWINDS

- **<u>Consensus</u>: "skeptical ROI of 5G investments will limit Operators' investments in new generation"**
  - "they'll delay 5G CapEx until they run out of capacity to support rising data usage

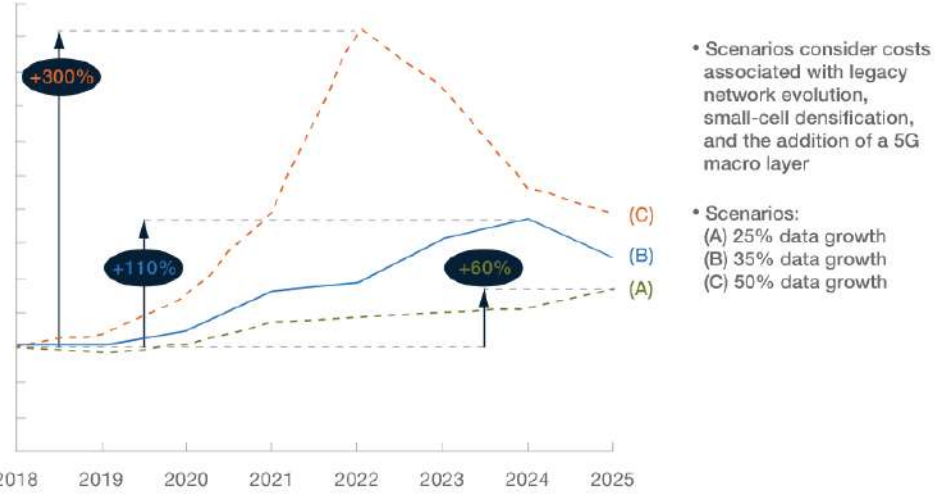


The 5G layer, small-cell, and additional macro sites will represent a greater proportion of network spend between 2020 and 2025.

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Total cost of ownership for mobile access networks will increase.



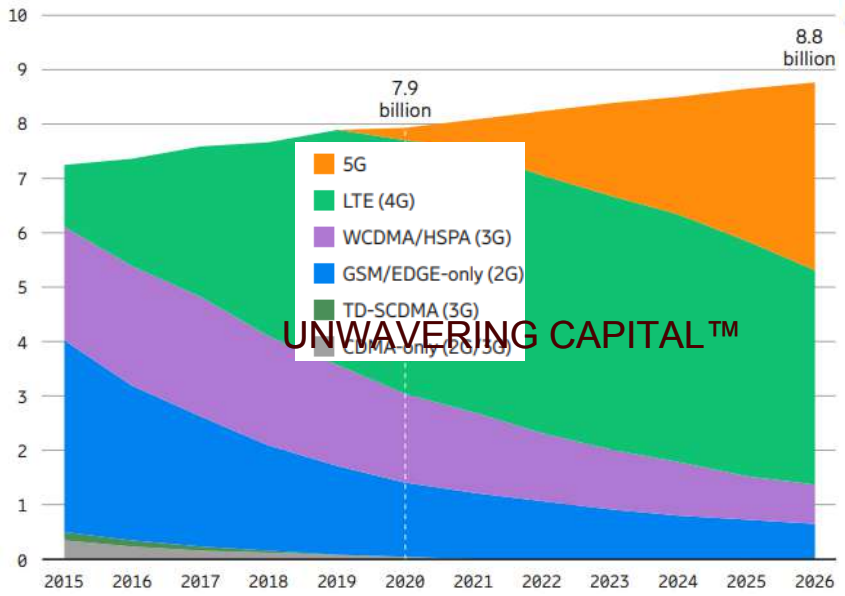
Note: Total cost of ownership includes capital expenditures and operational expenditures for radio access network and transmission but not core networks. Data are based on 3 operators in a European country. Results are rounded.

THESIS 1 – INDUSTRY TAILWINDS OFFSET HEADWINDS

Possible 5G cost reduction of 40%+: Reduce the risk by sharing access to capacity and paying accordingly

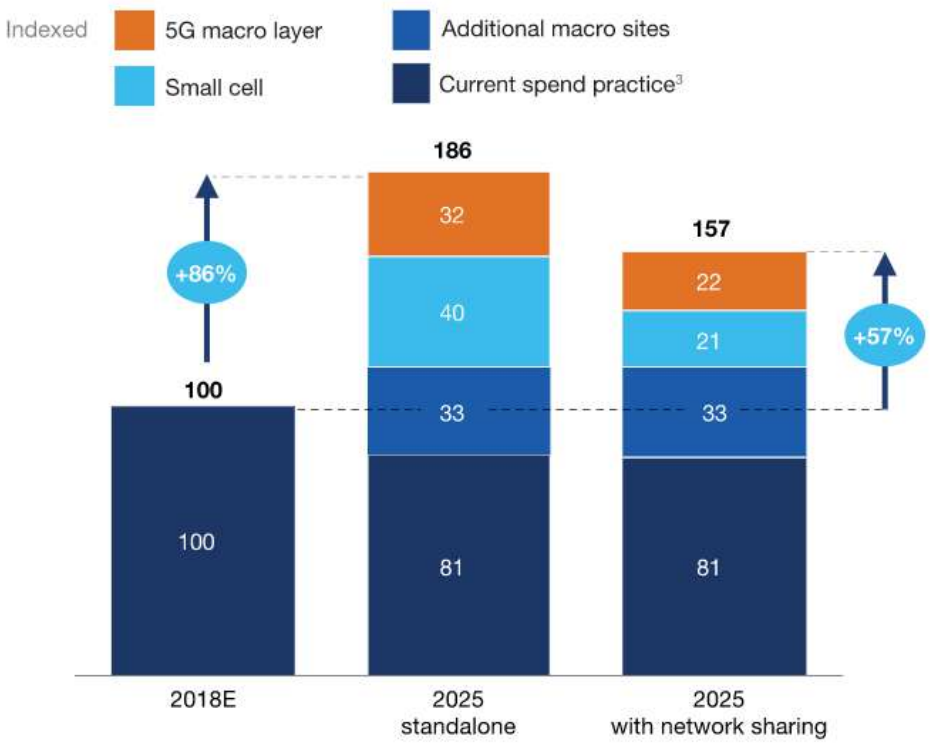
Stronger than expected demand for 5G phones and data usage led by COVID: Industry is at the early stage of S-Curve

Figure 1: Mobile subscriptions by technology (billion)



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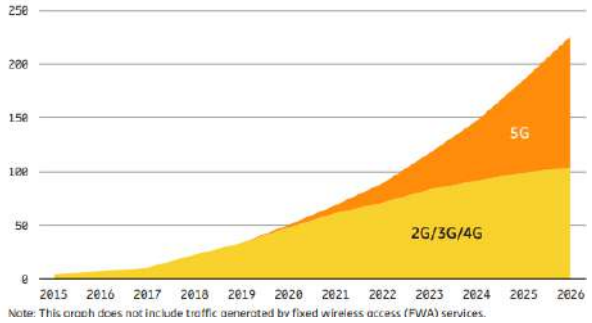
Access network TCO[1] evolution[2]



Network sharing is a lever that can reduce ~40% of the cost of 5G-related access-network domains (small cells and 5G macro layer)

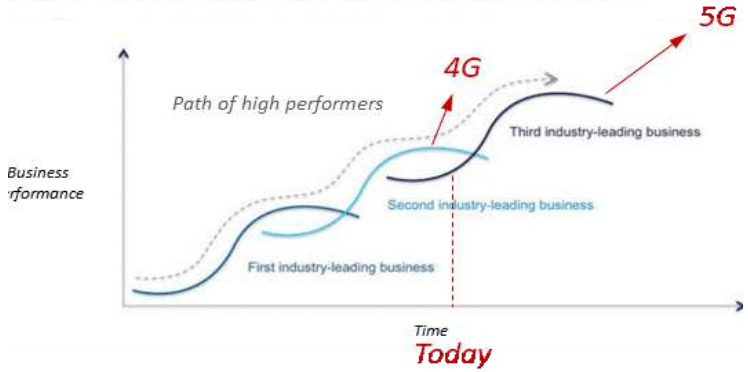
[1]Total cost of ownership includes both operational and capital expenditure.
[2]35% annual traffic growth assumed.
[3]Total cost of ownership of current network footprint, including capacity LTE and LTE-Pro upgrades

Figure 12: Global mobile data traffic (EB per month)

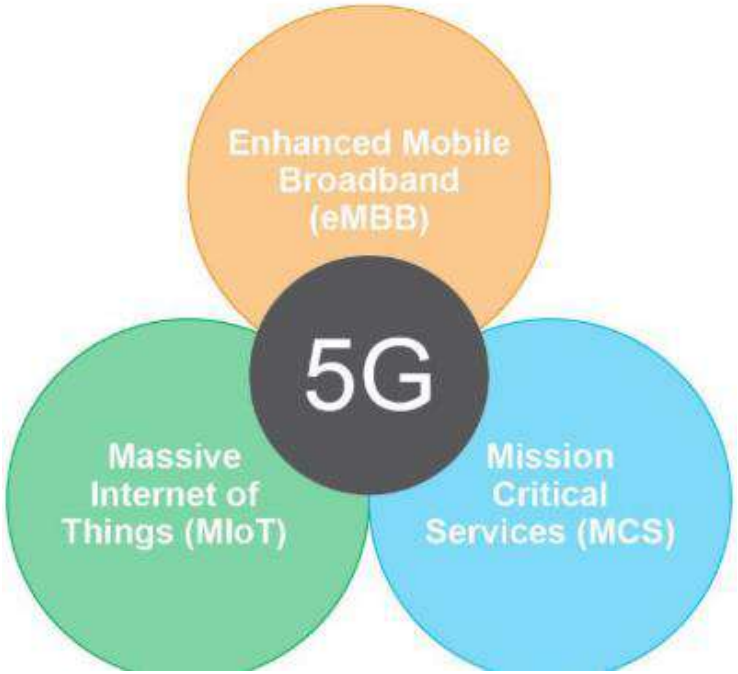


Note: This graph does not include traffic generated by fixed wireless access (FWA) services.

High Performers jump S-Curves to grow profits



THESIS 2: NOK'S TAM IS VASTLY UNDERVALUED



10x

Decrease in latency:
Delivering latency as low as 1 ms.

10x

Connection density:
Enabling more efficient signaling for IoT connectivity.

10x

Experienced throughput:
Bringing more uniform, multi-Gbps peak rates.

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3x

Spectrum efficiency:
Achieving even more bits per Hz with advanced antenna techniques.

100x

Traffic capacity:
Driving network hyper-densification with more small cells everywhere.

100x

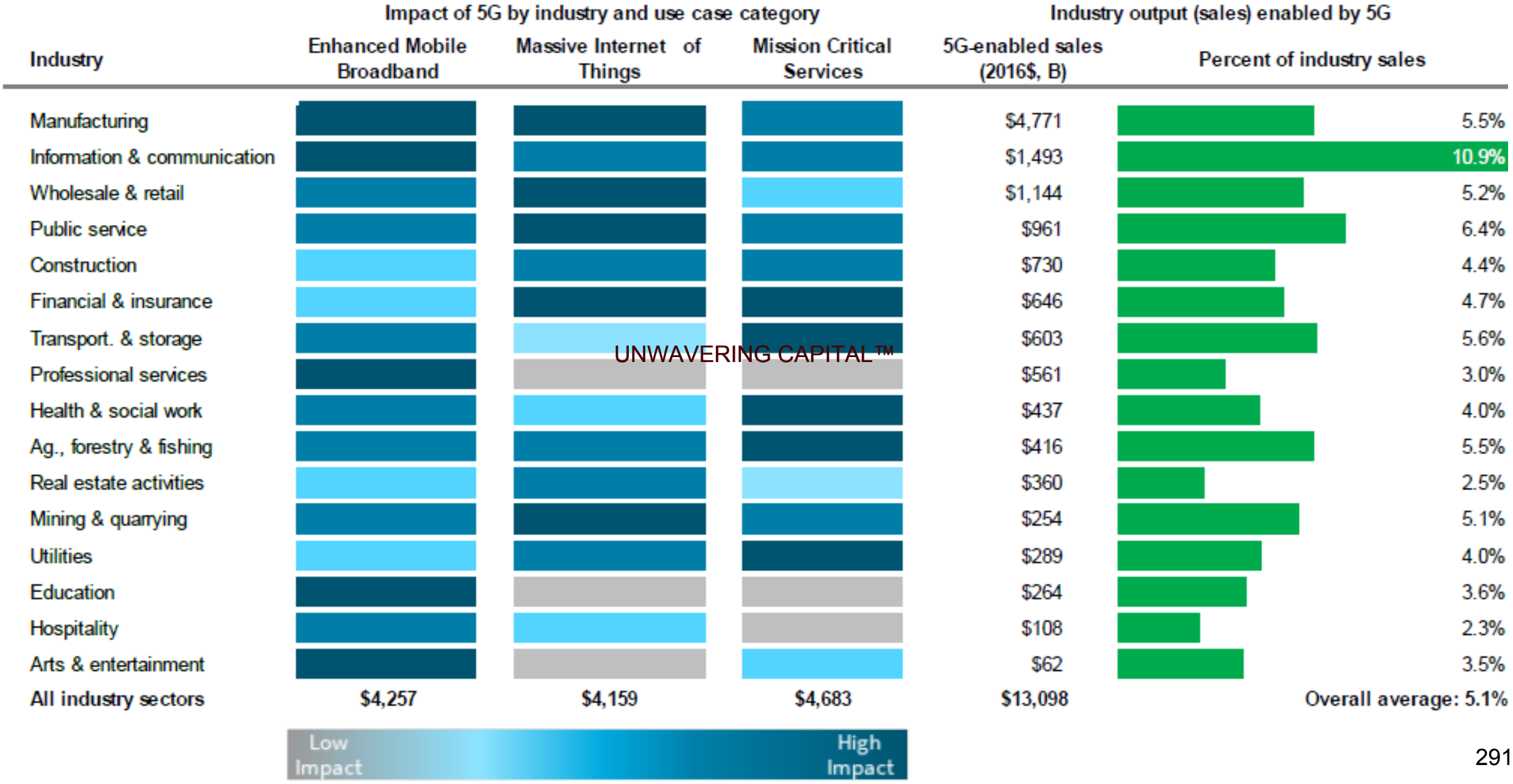
Network efficiency:
Optimizing network energy consumption with more efficient processing.



It takes around 10 years between two cellular generations, including a long transition phase with intermediate technologies.

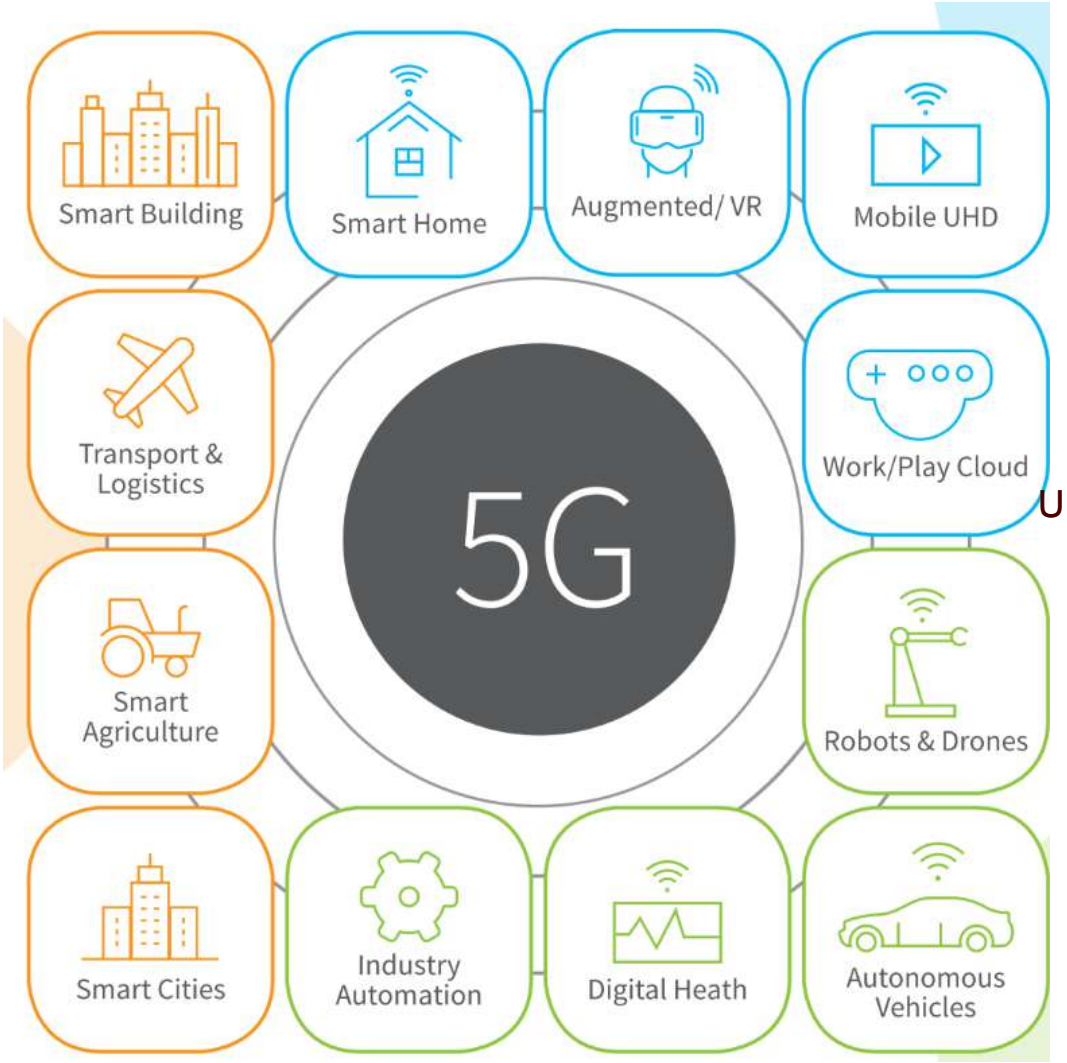


THESIS 2 – NOK'S TAM IS VASTLY UNDERVALUED



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THESIS 2 – NOK'S TAM IS VASTLY UNDERVALUED





Smart City Use Cases

- **Anticipate disruptions:** Boosts the economy by reducing transit/parking time
- **Boost energy efficiency**: Analytics to data that's streaming from smart grid sensors
- **Proactively maintain public assets:** Automatically know when they need maintenance
- **Improve citizen services:** Automatically detect when cleaning is needed

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THESIS 2 – NOK'S TAM IS VASTLY UNDERVALUED

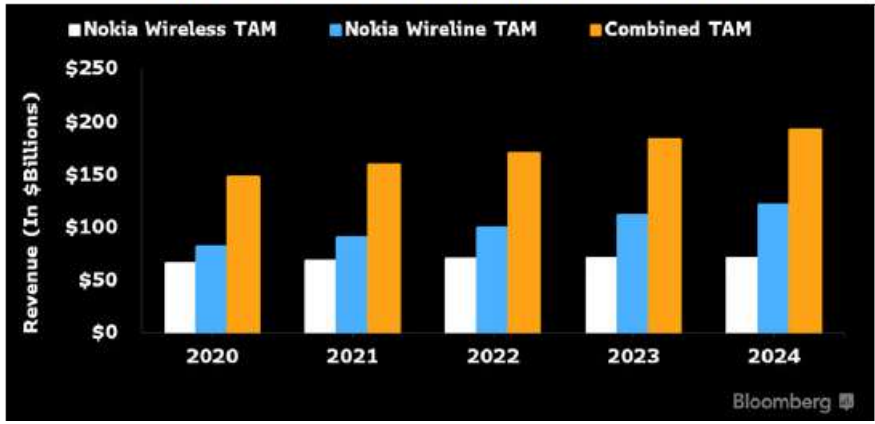
	Mobile Edge Computing	MIMO	Network Automation	Infrastructure	Network Analytics	Network as a Service	Service	Enterprise	
'25	$18B	$15B	$29B	$9B		$47B	$95B	$31B	$251B
'24	$14B	$11B	$24B	$7B		$33B	$66B	$22B	$182B
'23	$10B	$8B	$20B	$5B		$24B	$46B	$22B	$139B
'22	$8B	$6B	$17B	$3B		$17B	$32B	$22B	$108B
'21	$6B	$4B	$14B	$2B		$12B	$22B	$22B	$85B
'20	$5B	$3B	$12B	$2B		$9B	$15B		$48B
'19	$2B		$10B			$6B	$14B		$35B

$0B $25B $50B $75B $100B $125B $150B $175B $200B $225B $250B

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39% CAGR
(our variant view)

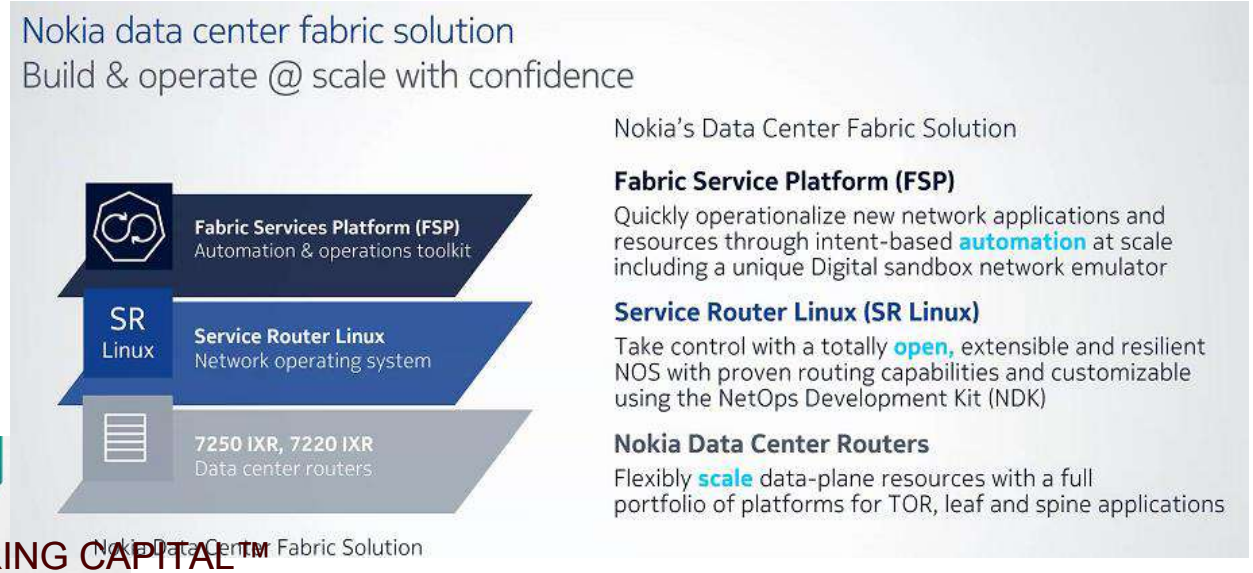
Nokia Total Addressable Market Forecast

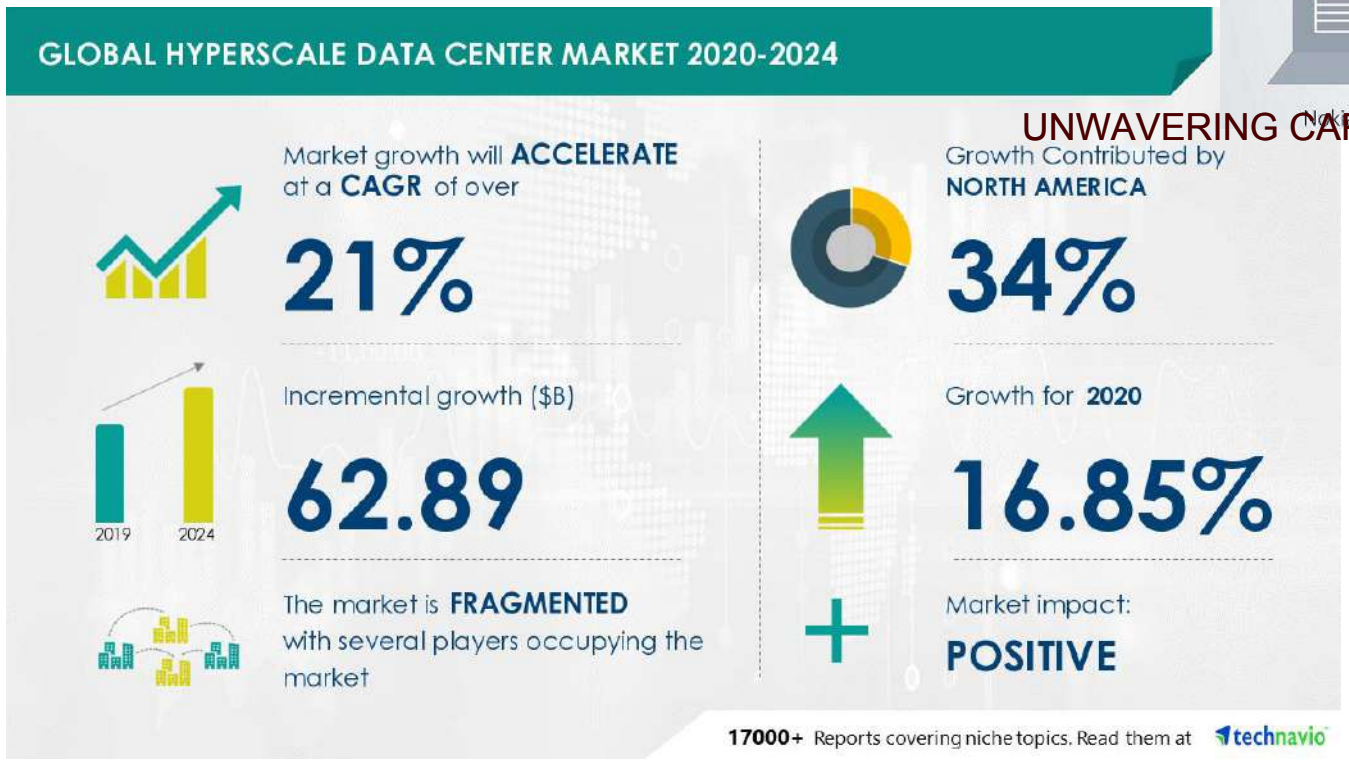


$194B in '24 from $149B in '20 with CAGR of 6.8% *(IHS estimates)*

THESIS 2: UNDERVALUED TAM (DATA CENTER SWITCHING)

- **NOK will take a great share of $17B data center switching market (’24)**
  - Able to leverage its existing technologies to penetrate emerging adjacent markets





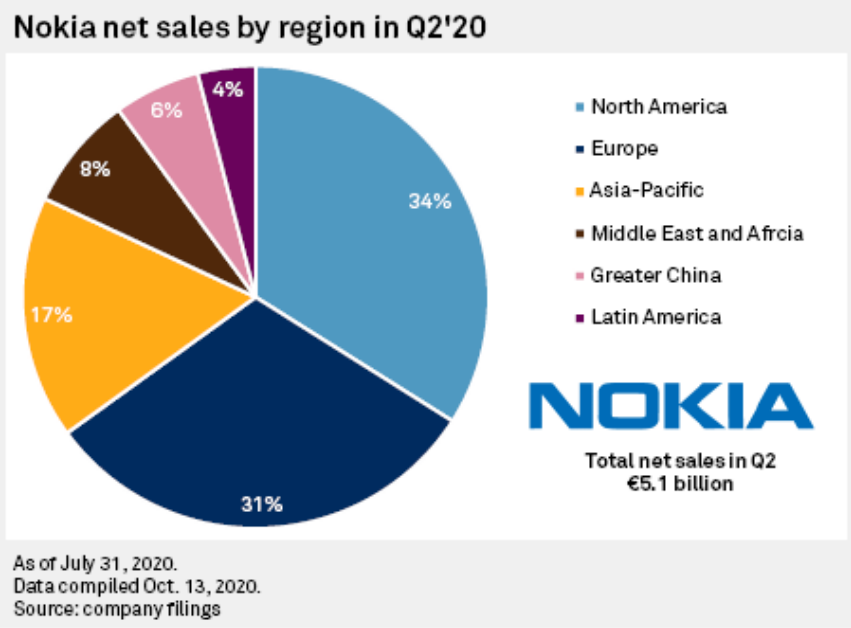
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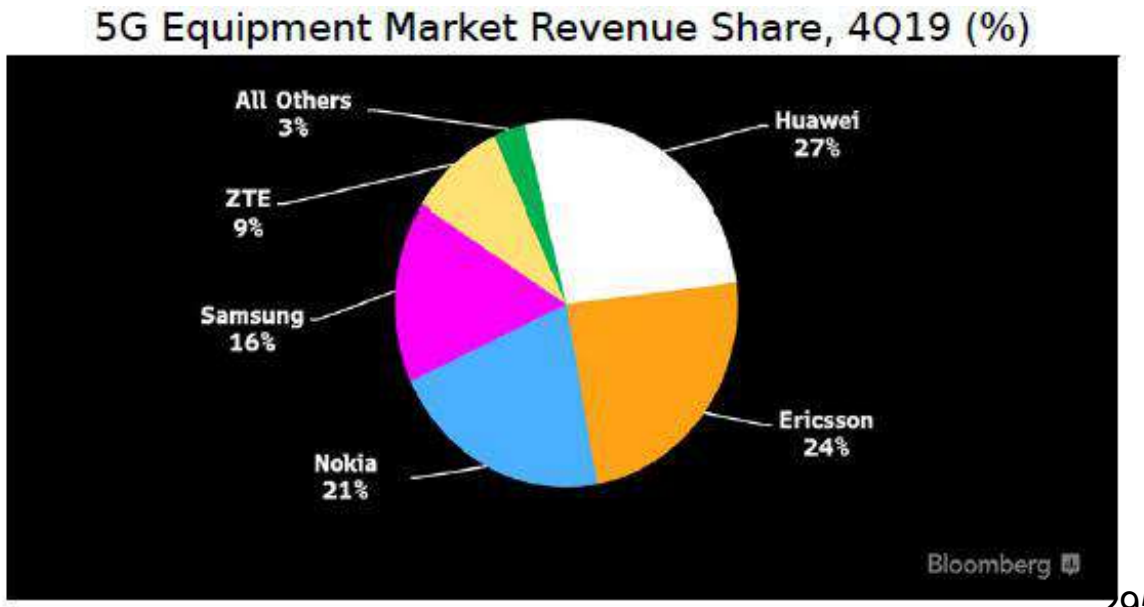


THESIS 3: CONTINUED PRESSURE ON HUAWEI BY THE US

- **Despite the skepticism, Biden will follow Trump's hard line on Huawei**
  - UK commits $333M to help carriers replace Huawei 5G by 2027
  - Samsung Electronics don't currently offer the right equipment to win immediate big deals with UK carriers
  - NOK & ERIC have already won major contracts from BT Group and CK Hutchison Holdings and will operate as duopolies in Europe

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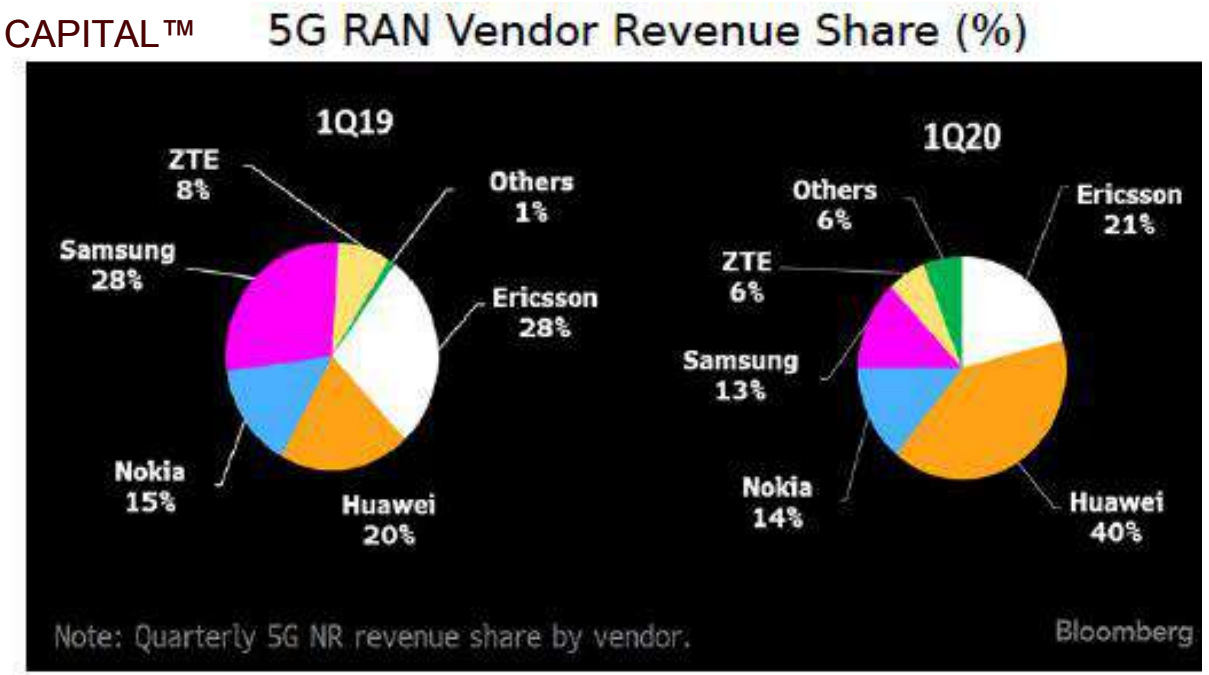


RISK 1: 5G RAN SHARE LOSS AT VERIZON TO SAMSUNG

- **$6.6B contract loss is the cost of NOK's late launch of its low-cost 5G base station**
  - VZ is among Nokia's largest customers
  - Share loss at this key account could dent NOK's growth outlook and slice of the 5G RAN market

- **Mitigant: Network Operators' deployment of Open Radio Access Networks (O-RAN), which diversifies vendors, limits NOK's share loss**
  - O-RAN is an open software-based network with hardware/software components from multiple vendors and still ensures interoperability (i.e. work) with those of other suppliers
  - O-RAN expected to eb a $3.2B market in '24

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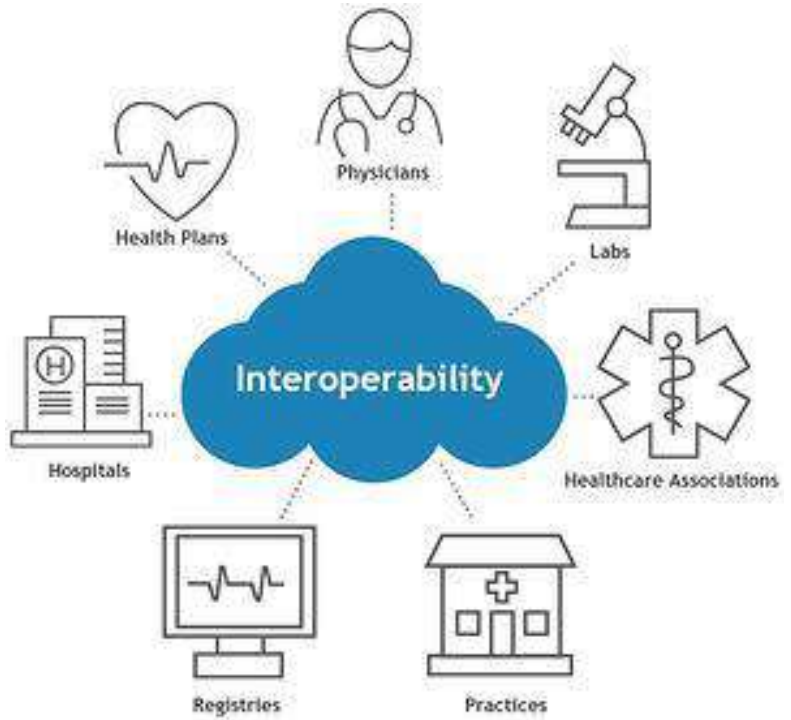
Source: IHS

RISK 2: INCREASING COMPETITION (O-RAN & V-RAN)

- **O-RAN invites cloud giants such as Facebook to compete**
  - FB's Telecom Infra Project targets the deployment of virtualized RAN (vRAN), an interoperable RAN solutions that are implemented on data center servers, rather than custom digital hardware

- **Mitigant: O-RAN has net positive impact on NOK**
  - NOK has a major first-mover advantage against Ericsson which only recently announced to ship Cloud RAN offering by late 2021, behind the launch of its competitors
  - Ericsson isn't in the O-RAN Policy Coalition,
  - Samsung announced the commercial availability of a virtualized RAN product

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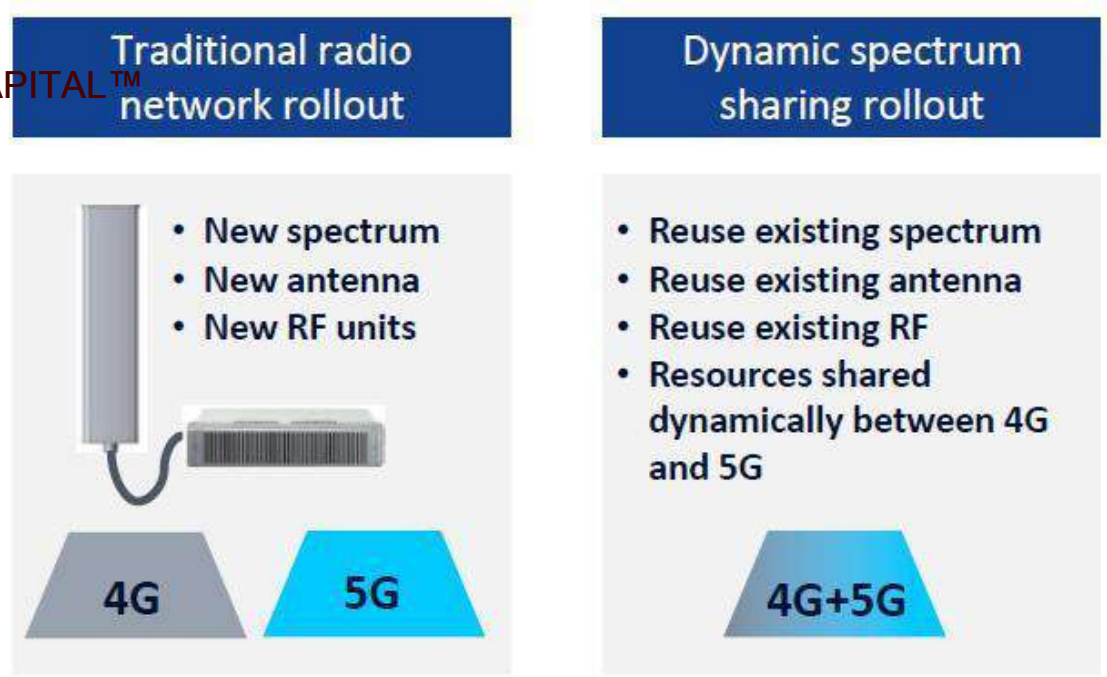


RISK 3: ERIC IS 8 MONTHS AHEAD OF NOK IN KEY TECH

- **Dynamic Sharing Spectrum (DSS) is a technology that allows the deployment of 4G LTE and 5G NR in the same frequency band and allocates spectrum resources between the two based on user demand**
  - Invites cloud giants such as Facebook to compete in the space

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- **Mitigants: However, open RAN has a net positive impact on NOK**
  - NOK has a major first-mover advantage against Ericsson whose introduction of its Cloud RAN offering that it expects to begin shipping by late 2021



Our DCF indicates a 36% upside & slightly positive FCF by year end 2020

Valuation	
EV	29,945
(-) Total Debt	(6,694)
(+) Cash & Cash Equivalent	7,632
(-) Minority	(83)
Equity	**30,800**
Shares Outstanding	5,629
Target Price	5.47
Upside/(Downside)	35.8%

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Long-Term Growth Rate

Network Gross Margin in 2021	1.50%	1.75%	2.00%	2.25%	2.50%
31.0%	-33.3%	-24.0%	-11.3%	6.8%	34.8%
31.5%	-15.7%	-3.8%	12.2%	35.2%	70.6%
32.0%	1.9%	16.3%	35.8%	63.5%	106.4%
32.5%	19.6%	36.5%	59.3%	91.9%	142.2%
33.0%	37.2%	56.6%	82.8%	120.2%	178.0%

DCF	2020	2021	2022	2023	2024
EBIT	(244)	(20)	176	386	607
Tax Rate (%)	20.0%	20.0%	20.0%	20.0%	20.0%
NOPAT	(195)	(16)	140	309	485
(+) D&A	850	833	837	845	855
(-) Changes in OWK	102	108	60	61	63
(-) Capex	(752)	(860)	(881)	(902)	(924)
Free Cash Flow to Firm	5	64	157	313	479
Terminal Value					34,382

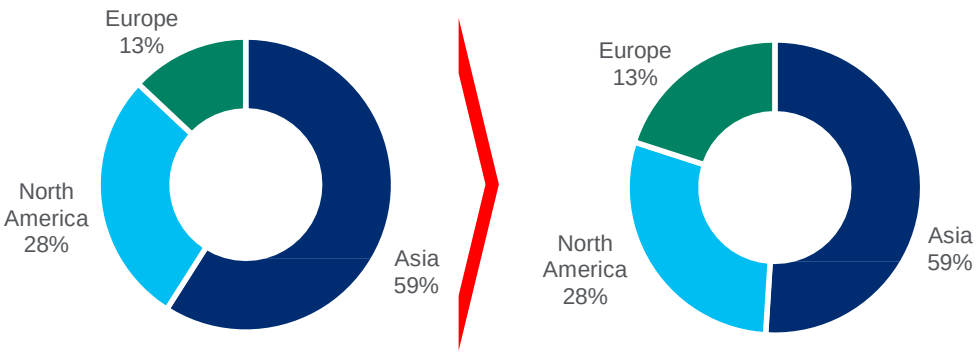
Network Sales Growth in 2021

Network Gross Margin in 2021	0.00%	5.00%	10.00%	15.00%	20.00%
31.0%	-1.2%	-13.8%	-26.5%	-39.1%	-51.8%
31.5%	21.5%	9.9%	-1.6%	-13.1%	-24.6%
32.0%	44.1%	33.7%	23.3%	12.9%	2.5%
32.5%	66.7%	57.4%	48.2%	38.9%	29.7%
33.0%	89.3%	81.2%	73.1%	64.9%	56.8%

A Lot of Buzz Around the Potential of The Internet of Things (IoT)

IoT Market will Grow to $1.7 Trillion 2020 Growing at a 16.9%

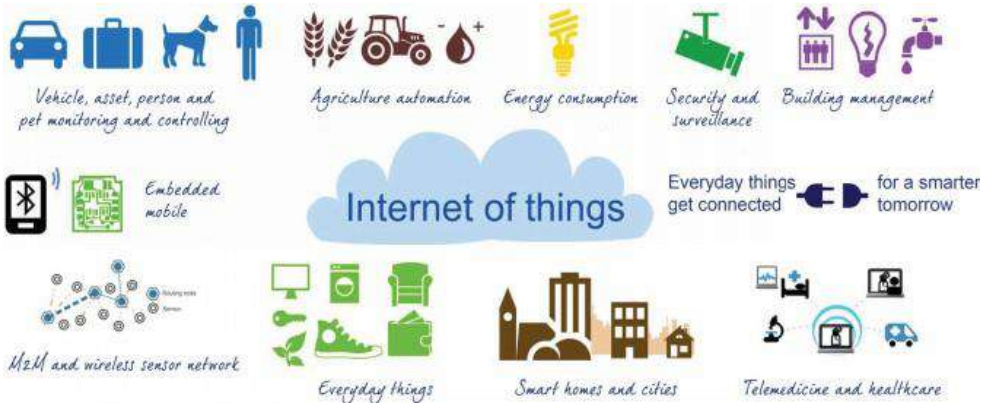
By Revenue from IoT in 2014 By Revenue from IoT in 2020



Source: Research Firm IDC.

There will be 30 Billion of IoT Devices in 2020

IoT has a Potential Economic Impact of of $11.1 Trillion a year by 2025



Source: www.satizpm.it

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Broad Interest in IoT Companies is Driving Up Prices, Dissuading Financial Investors

Recent IoT M&A Activity by Type of Deal

Type of Deal	Main Motive for Deal	Examples	Comment
M2M companies achieving vertical integration in the M2M space	To add capabilities	• Sierra Wireless acquiring Wireless Maingate and InMotion • Numerex acquiring AVIDwireless, Digilog and others	Typically acquisitions by technology companies extend their capabilities, allowing them to diversify from commodity to more unique products
Telecoms network operators moving in the value chain	To add capabilities	• Orange buying Ocean • Vodafone buying Cobra, Zelitron and others • Telenor buying Iowa	Most investments by telecoms operators has been to gain new capabilities (e.g. systems integration skills in the case of Telenor) or enter new vertical markets (e.g. Orange / Ocean)
Industrial players acquiring M2M capabilities in support of their core businesses	To add capabilities	• British Gas buying AlertMe • ABB buying Tropos Networks	Industrial players (i.e. non-technology companies) looking to vertically integrate are buying solution providers
Technology companies gaining new capabilities	To add capabilities	• **Google buying Nest & Dropcam** • Amazon buying 2lemetry • ARM buying Sensionde and Offspark	Technology companies looking to complement their existing offerings
M2M companies consolidating their position in the value chain	Defensive	• Merger of KORE and Raco	Not all investments in IoT are about gaining new positions in the value chain. As larger organizations scale up their IoT activities, smaller firms are merging to protect their position
Financial investors buying mature companies	Purely financial	• FleetCor and Summit buying Masternaut • Vista Equity Partners buying Omnitracs	Financial investors looking to buy mature, well-established service providers. Fleet management, in particular, has been a focus

Appendix 1 | Google's Acquisition of Nest (pg 1)

Nest Has Strong Presence in the Household Appliances Market

Nest Learning Thermostat is Still the Leader in the Category – It Offers the Best Combination of Design and Features

Nest's Main Competitors in Smart Thermostat

Company	Product	Product Name	Overall Consumer Rating	Price	Wi-Fi / Wireless / Touchscreen	Warranty	Best Suitability	Time to Target Temperature	Ease of Use	Home Automation Platform	Live Chat Support	What's Unique?
Google nest		Nest Learning Thermostat 3rd Generation	9.78	$249	ü	2 Years	Small House	ü	95%	Nest		**Farsight**, a key feature, detect people from 20 feet away, lighting up with big temperature reading
		**Ecobee3**	9.70	$249	ü	3 Years	Large House		95%	HomeKit; Zigbee		Tiny, wireless remote sensors relay climate conditions from the house back the thermostat
Honeywell		**Lyric**	9.45	$279	ü	2 Years	Rental Properties		80%	Lyric	ü	When you're away, energy-saving mode is activated, and when you get within seven miles of your house, your preferred temperature will kick in

Source: TopTenReviews.Com

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Reinventing the So Called "Unloved Products" in Homes by Connecting Devices to the Internet and Making them Easier to Use

Nest's Product Portfolio and Services







- **Nest Protect Second Generation** is a smoke and carbon monoxide detector
- First device arrived in late 2013 and was recalled in May 2014
- Updated version includes sensors to detect how quickly a fire is developing
- Selling for $99, the false alarms can be switched off through the Nest mobile app



- **Nest Cam** is a revamped version of the **Dropcam**, made by a startup that Nest acquired for $555M in 2014
- Unveiled on June 17, 2015, records higher-resolution video and uses algorithms to detect unusual activity in homes and alert users
- Sells for $199



- **Nest app 5.0** brings together all three Nest products, across multiple platforms, for the first time, making it easier to access and control Nest products
- **Work With Nest** program helps its devices connect to devices from other manufacturers to fine tune your home's energy use
- **Nest Weave**, new communication protocol, lets devices talk to teach other

Source: Nest press Room.

Appendix 1 | Google's Acquisition of Nest (pg 2)

Nest Fits in Google's Vision of a Connected World

Nest Strengthens Google's Presence in Interconnected Devices

Google's Initial Efforts to Create a Ecosystem of Interconnected Devices



"Launch of Smart TV have **FAILED** to deliver desired success"



"Chomecast Dongle met **MILD SUCCESS**"



"Power Meter was **RETIRED** IN 2011"

"Develop the **Next Generation** Of Internet-enabled Home Gadgets"

Google / Nest Face Challenges and Potential Pitfalls

Google's Initial Efforts to Create a Ecosystem of Interconnected Devices

Pros of Nest Acqusition



Bringing in High-Profile Executives

- Tony Fadell (Nest's co-founder & CEO) previously served as the Senior VP at Apple and is known as "one of the fathers of the iPod"
- Matt Rogers (Nest's co-founder and VP of Engineering) was involved in the development of iPod, iPhone and iPad

Staying Ahead of Competitors

- The Competition to control the next generation of smart devices, including appliances and door locks is fierce
- Acquisition enables first mover advantage an

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Cons of Nest Acqusition



May be Too Early

- The industry is still at an early-stage and taking 100% ownership of Nest could be risky and costly for Google than it would have been with its prior ~12% ownership
- Some say partnerships could be a "safer" move than acquisitions until the market grows more



Synergies May Not be Realized

- On January 2015, founding VP of Tech Yoky Matsuoka and Gregy Duffy, who had come to Nest as the CEO of acquired Dropcam, left
- Low morale after Dropcam employees were told to work Saturdays for a release they don't believe in

Google Paid Rich Valuations to Acquire the Disruptive Platform

Google Believed that Nest Could Ramp Its Revenues Significantly With Google's Financial Resources and Support Network…

Simple Discounted Cash Flow Analysis – Operating Model

	2013E	2014E	2015E
Nest Learning Thermostat	1,000,000	2,000,000	4,000,000
Unit Price	$249	$249	$249
Revenue from Thermostats	$249,000,000	$498,000,000	$996,000,000
Nest Protect	500,000	600,000	720,000
Unit Price	$99	$99	$99
Revenue from Smoke Detector	$49,500,000	$59,400,000	$71,280,000
Nest Cam	--	--	500,000
Unit Price	--	--	$199
Revenue from Security Camera	--	--	$99,500,000
Nest Aware Subscription	--	--	50,000
Average Prices of 10-day and 30-day	--	--	$200
Revenue from Subscription Plans	--	--	$10,000,000
Total Revenue	$298,500,000	$557,400,000	$1,176,780,000
EBITDA	$179,100,000	$172,794,000	$364,801,800
Revenue Multiple	10.7x	5.7x	2.7x
EBITDA Multiple	17.9x	18.5x	8.8x



Since Fadell said the company has thermostats in ~1% of US homes, assuming Nest sold 800k of it in 2013

Research from Berg Insight reveals that Thermostat sales doubled in 2014



Smoke alarm has much higher units-per-household ratio than the thermostats, meaning it could be much more valuable product line



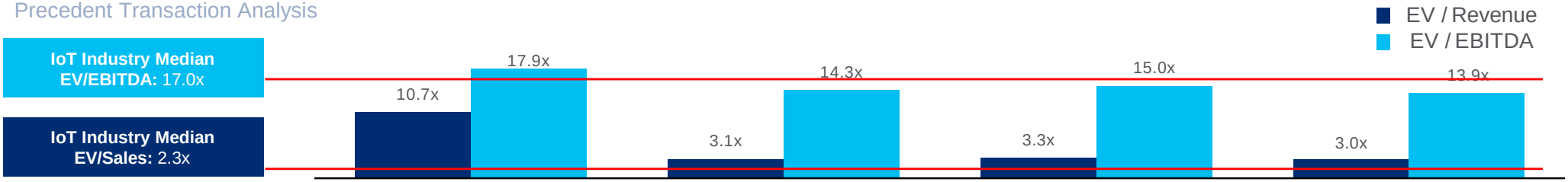
Under Google, Nest's sales momentum would have accelerated and expense would have been lower. Used Google's 31% EBITDA margin

Nest benefited from declining costs of hardware and components

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…So Google Was Willing to Pay a Rich Premium

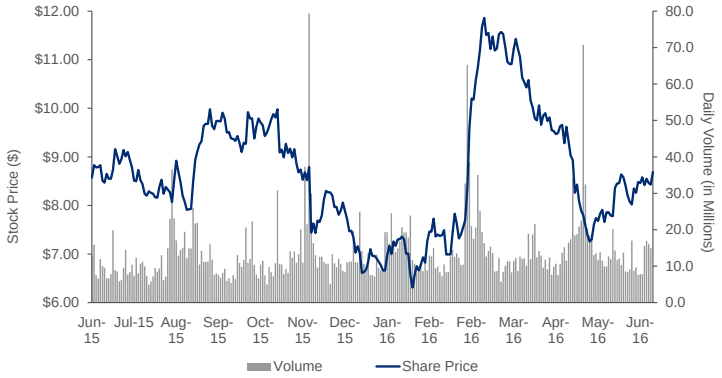
Precedent Transaction Analysis



Target	nest	elster	Elektrobit ' Automotive Software Unit	alertme
Acquirer	Google	Honeywell	Continental	British Gas
Deal Value (in US $MM)	3,200	5,100	687	100
Date	01/13/14	07/28/15	05/19/15	02/03/15
Strategic Rationale	To develop the next generation of Internet-enabled home gadgets	To extend Honeywell's equipment offerings – Elster is a maker of gas, electric and water meters	To play in the market for connected / driverless car and IoT inventory for auto manufacturers	To acquire a platform for controlling heating and water remotely

Appendix 1 | Google's Acquisition of Nest (pg 4)

Stock Pitch – SHORT Recommendation for J.C. Penney Company ["JCP" / NYSE]



Sell	
Price (June 28, 2016)	US$8.69
Target Price	US$7.76
Expected Share Price Return	-10.7%
Expected dividend yield	0.0%
Expected Total Return	**-10.7%**
Market Cap	US$2,589M
52 Week Range	US$6.00 - US$11.99
Shares Outstanding	307.4M
Float	292.4M
Short Interest / % of float	90.0M / 30.8%
3-Mth Avg Daily Trading Volume	14,833,191

Recommendation

I recommend shorting J.C. Penney, a major U.S. retailer, which currently trades at $8.69 per share. My 12 month target price for JCP is $7.76.

JCP is facing: 1) major threat from Amazon, 2) fundamental industry challenges, and 3) burdensome debt load on its balance sheet.

However, the retailer may perform well given that: 1) its strategic initiatives are still underway, 2) the Company may deleverage and enhance its margin; and 3) it is implementing a disciplined inventory management.

Company Background

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J.C. Penney provides merchandise and services to 87 million active consumers through ~1,000 mall-based department stores and ecommerce website. The Company's merchandise mix of total 2015 net sales was as follows: women's apparel and accessories, including Sephora (37%), men's apparel and accessories (22%), home furnishing (12%), children's apparel (10%), footwear and handbags (8%), jewelry (6%), and services and other (5%).

In 2013, Bill Ackman took $600 million loss on Penney after failing to revamp the retailer for more than two years. His initial strategy, through Ron Johnson (former Apple retail executive), was to eliminate discounts and do away with popular house brands. Without first testing these ideas, the plan led to a 25% drop in Penney's sales, a loss of nearly $1 billion, a loss of thousands of jobs, and a $5 billion in long-term debt.

CEO Marvin Ellision has been implementing a three-part turnaround strategy: 1) to evolve into omnichannel retailer that creates a seamless connection between digital and brick-and-mortar operations, 2) to grow private brand penetration, and 3) to increase revenue per customer.

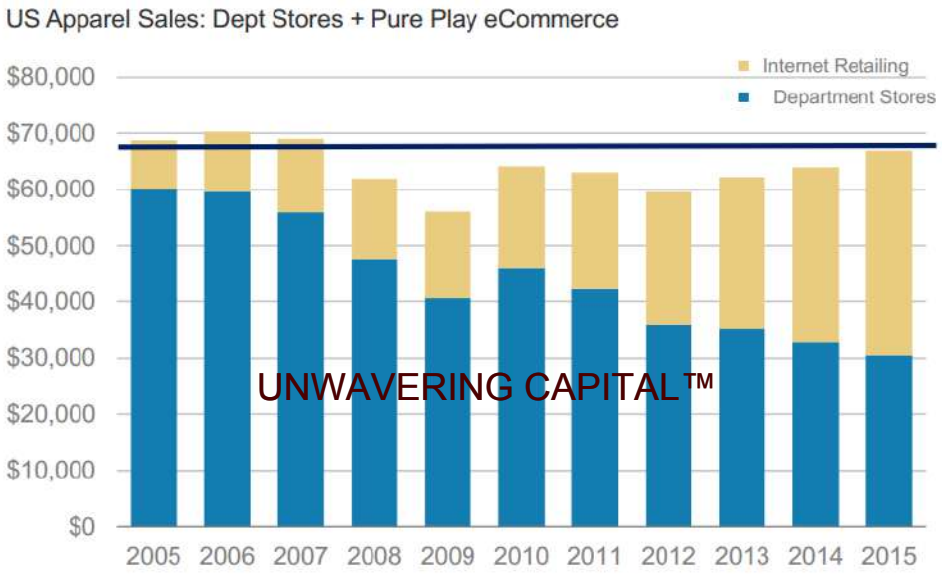
Despite these efforts, Penney reported first quarter sales well below analyst expectations. The company posted revenue of $2.86 billion vs. $2.92 billion expected and a loss of 22 cents a share vs. 37 cent-a-share loss estimated.

Investment Thesis

1) Amazon Effect

Retail stocks have been getting hammered following disappointing quarterly sales numbers from Macy's Gap, and Kohl's. All three reported sales declines, and they aren't alone. Dozens of other department stores and apparel retailers including Sears, Kmart, Nordstrom, and J.Crew have reported declines this year. The biggest reason for this trend: Amazon.

The e-commerce giant, which has made an aggressive push into apparel and fashion, is taking significant market share from traditional department stores. It already accounts ~7% of the overall U.S. apparel market and will reach 19% by 2020. The following chart illustrates department stores' loss of market share.



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Morgan Stanley expects total department store revenue declines to accelerate from a rate of -6.5$ annually to a rate of -8.5% annually through 2020. As a result, department stores will eventually comprise just 7% of the total US apparel market in 2020 versus 11% today and 26% in 2015.

2) Secular challenges

4Q was a tough quarter for the department store space with weak mall traffic, a promotional environment, and inventory markdowns due to unseasonable weather patterns. JCP, for instance, has suffered same store sales decline of 0.4% and gross margin decline of 20bps to 36.2%. With the ongoing shift in consumer spending away from apparel, the entire department store space is structurally disadvantaged. This makes JCP's turnaround strategy that much harder and unsustainable.

CEO Ellison, with his 12 years of experience at Home Depot, is knowledgeable of the home category space and has been building exposure in home appliance. While his initiative seems logical, I don't believe that this is enough to address JCP's traffic problems.

3) JCP's high debt load indicate a possible default

The retailer is 6.8x levered with $4.4 billion in debt and $0.9 billion in cash. EBITDA / Interest is 1.8x. With uncertain prospect of JCP generating meaningful top-line growth, the Company is likely to face a bankruptcy.

Valuation

My DCF-based target price of $7.76 represents an implied multiple of ~4.6x my 2017E EBITDA of $1.6 billion, a discount to its department store peers.

JCP Discounted Cash Flow Analysis	Historical		Projected				
	2014E	2015E	2016E	2017E	2018E	2019E	2020E
Revenue	$12,257	$12,625	$12,656	$12,669	$12,675	$12,676	$12,678
Cost of Sales	(7,996)	(8,074)	(8,120)	(8,166)	(8,213)	(8,260)	(8,307)
Gross Profit	**4,261**	**4,551**	**4,536**	**4,502**	**4,462**	**4,417**	**4,371**
Operating Expenses	(3,851)	(3,816)	(3,589)	(3,376)	(3,175)	(2,986)	(2,808)
EBIT (Adj)	**410**	**735**	**947**	**1,127**	**1,287**	**1,431**	**1,563**
Tax Expense	(39)	(80)	(104)	(123)	(141)	(157)	(171)
After-tax EBIT	**371**	**655**	**843**	**1,004**	**1,147**	**1,274**	**1,392**
+ Depreciation & Amortisation	631	616	607	598	589	581	572
- Capital Expenditures	(252)	(320)	(375)	(439)	(515)	(603)	(707)
- Net Working Capital	379	139	(216)	(256)	(462)	(636)	(795)
Unlevered Free Cash Flow	**1,129**	**1,090**	**859**	**906**	**759**	**616**	**462**
Terminal Value							**7,368**
Discounted Cash Flow			**767**	**697**	**512**	**364**	**3,596**

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Enterprise Value	$5,924	EBITDAx	4.6x
- Debt	4,412	Weighted Average Cost of Capital	14.0%
+ Cash	872		
Implied Equity Value	$2,384		
Shares Outstanding (in MM)	307		
Implied Share Price	**$7.76**		

Source: Company filings.

JCP Comparable Company Analysis

Company Name	Ticker	Share Price	Change Since 1/1/2016	% 52-Wk High	Market Cap (in $ MN)	Firm Value (in $ MN)	FV / EBITDA 2015	FV / EBITDA 2016	FV / EBITDA 2017	P/E 2015	P/E 2016	P/E 2017	PEG 2015	PEG 2016	PEG 2017
Amazon.com, Inc.	AMZN	$707.95	4.7%	96.8%	$318,344	$341,966	30.6x	20.9x	15.3x	540.7x	130.2x	71.0x	13.2x	3.0x	1.6x
Michael Kors Holdings Ltd	KORS	47.44	18.4	79.8	9,929	8,273	5.8	6.6	6.0	12.5	10.6	9.8	2.6	2.5	2.3
Macy's Inc	M	32.43	(7.3)	44.1	13,861	17,071	5.1	5.6	5.5	12.5	10.3	9.8	0.7	0.9	0.8
Nordstrom, Inc.	JWN	37.11	(25.5)	46.3	8,519	8,836	5.2	6.2	5.8	15.6	14.8	13.3	1.3	1.7	1.6
Wal-Mart Stores, Inc.	WMT	71.51	16.7	96.5	209,830	270,543	7.9	8.3	8.3	14.5	16.9	16.3	5.0	5.3	5.1
Mean			0.6%	66.6%			6.0x	6.7x	6.4x	13.8x	13.2x	12.3x	2.4x	2.6x	2.5x
Median			4.7	63.0			5.5	6.4	5.9	13.5	12.7	11.5	2.0	2.1	1.9
J. C. Penney Company, Inc.	JCP	$8.69	30.5%	72.5	$2,222	$6,988	9.3x	6.2x	4.8x	--	179.4x	12.1x	--	--	--

Source: Company filings and Factset as of June 28, 2016.

Investment Risks

1) Strategic initiatives are still underway

JCP has been focusing rightly on categories in retail that are doing well, such as beauty and "center core" (footwear, handbags). Within apparel, the retailer has improved its fit, fashion, and selection (the offering and sizing options). The rollout of Sephora and revamp of the JCP salons could be meaningful as a traffic differentiator. JCP has the size and scale to be a potential leader in omni-channel space.

In addition, JCP has introduced its new brand platform "Get Your Penney's Worth", strong online/mobile sales, and the full rollout of Opus in the year. These initiatives could yield same stores sales growth of 3~4% in 2016 and revenue growth to under pace comps by about 60bps.

2) JCP may deleverage and enhance margin

JCP repurchased $60 million of debt in 1Q. It is also planning to retire the $300 million of debt coming due in '16 & '17 and is looking at other debt reduction opportunities. The Company is also continuing to look at the market for the right time to extend/reprice its real estate term loan. Debt repayment initiatives are guided to be heavier in mid-2016. Longer term, the Company said it would get below 3x total leverage (a year-end 2017 target) before considering share repurchases.

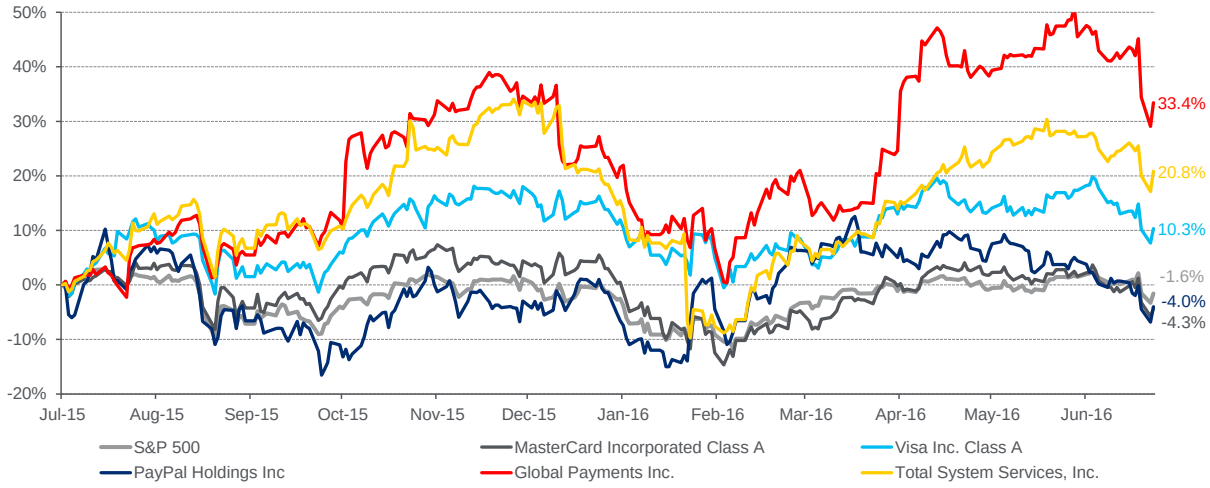
Much of the improvement to the bottom-line has been driven by SG&A savings, particularly in 1Q. These include reducing back office tasks and reallocating labor to customer facing labor.

3) Disciplined inventory management

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CEO Ellison stressed JCP's disciplined inventory management approach, focusing on prudent investment in maintaining in stocks, and growth initiatives such as beauty, athletic, and footwear. For the non-initiative area, the company expects inventory to be flat to down YoY. Importantly, JCP will not hold any inventory for its new partnerships with Ashley and Empire, minimizing risk of heavy markdowns and margin declines if sales soften.

Stock Pitch – LONG Recommendation for MasterCard ["MA" / NYSE]



Recommendation

I recommend buying MasterCard, the second largest payment network behind Visa. MasterCard currently trades at $90.42 per share and my 12 month target price for MA is $117, based on 29x my 2017 EPS estimate of $4.06.

With expected dividend yield of 0.8%, MA's expected total return is 30.2%.

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Investment catalysts are 1) solid economic sentiment and consumer confidence, 2) competitive edge over emerging players, and 3) MA's better outlook compared to Visa's.

Buy	
Price (June 28, 2016)	US$90.42
Target Price	US$117.00
Expected Share Price Return	29.4%
Expected dividend yield	0.8%
Expected Total Return	**30.2%**
Market Cap	US$103,398M
52 Week Range	US$74.61 - US$101.76
Shares Outstanding	1,078.3M
Float	957.2M
Short Interest / % of float	5.2M / 0.6%
3-Mth Avg Daily Trading Volume	4,155,262

Key investment risks include 1) continued strengthening of the US dollar, 2) regulatory and legal risks, and 3) bank consolidation.

Company Background

MasterCard is a technology company in the global payments industry. It provides payment solutions, transaction processing, and consulting and information services. MA's platform includes debit, credit, and pre-paid options through their MasterCard and Maestro-branded cards.

MA's revenues grew at a CAGR of 14.4% since 2010. Its net income grew at a CAGR of 18.3% during the same period. General and administration expenses (personnel costs, professional fees, and data processing and telecommunications expenses) accounts for ~75% of the company's total operating expenses. MA has industry leading margins, with 55.1% operating profit margin and 38.9% net profit margin.

On April 28, 2016, MA topped 1Q earnings and revenue expectations. The processor of card payments posted revenue of $2.45 billion and net income of 86 cents per share. Wall Street was expecting earnings of $2.38 billion and net income of 85 cents per shares.

On a currency-neutral basis, net revenue increased 14%, driven by the impact of: 1) an increase in processed transactions of 14%, to 12.6 billion, 2) a 13% increase in gross dollar volume, on a local currency basis, to $1.1 trillion, 3) an increase in cross-border volumes of 12%.

Worldwide purchase volume during the quarter was up 12% on a local currency basis versus the first quarter of 2015, to $838 billion.

Profits slid 6% as the card company offered increased rebates and promotions to grab customers and came up against a period that included an one-time tax benefit. MA's effective tax rate was 28.3% in the 2016 1Q, versus a rate of 23.9% in the comparable period in 2015. The increase was primarily due to the non-recurrence of a discrete U.S. foreign tax credit benefit which occurred in the 2015 1Q.

Investment Catalysts

1) Solid economic market sentiment and consumer confidence

Data released on June 14, 2016 indicated that U.S. retail sales rose 0.5% as consumers showed more confidence. Additionally, with the firming inflation, a solid housing market, low layoffs and rising number of job openings, the economy appears to be standing on a decent footing than what the market has anticipated. While the recent slowdown in payrolls is still a concern, the persistence of strong consumer spending suggests that household fundamentals are not breaking down significantly.

In China, June 14's weak investment data coincided with reports showing property and auto sales still going strong. Despite the prospect of smaller wage increases this year and growing concern over unemployment, May retail spending also held up.

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With the pick-up in consumer spending globally, there will be larger gross dollar volume and processed transactions. These would then generate more transaction processing fees for MasterCard (for both domestic assessments and cross-border volume fees). Given that these fee account for more than half of MasterCard's total revenues, MA will offer consistent double-digit revenue growth.

2) Competitive edge over emerging players

The payment industry has become more complex, with new technologies, products, and players. MA faces competition from newer payment providers such as PayPal, AliPay, and Amazon. It also faces competition from merchants (Walmart Pay), mobile operators (Android Pay, Samsung Pay), and third-party transaction processors (First Data and Total System Services). As a result, investors have been concerned on the threat these new competitors present to MasterCard.

However, MasterCard's brand name, product range, and track record of secure transaction processing give it an edge over the new competitors. MA is also already present in individual markets globally. Furthermore, MA has already been adopting technologically advanced products and platforms like its digital wallet MasterPass.

The market does not recognize that MA can also act as partner to these new players. For instance, Apple Pay is now available to Canadian MA cardholders. Apple Pay leverages MA's safe and secure platform, MDES (MasterCard Digital Enablement Service), which uses the most advanced payment technologies – EMV, tokenization, cryptography, and biometrics—to ensure the integrity of cardholder information.

In Asia, MA is partnering with SoftBank and its robot 'Pepper' to offer payment services in order to gradually allow customers to pay from different gadgets like fitness brands and refrigerators. MA also

plans to launch its payment service at Pizza Hut Restaurants Asia, a unit of Yum Brands, piloting Pepper in its stores by the end of 2016 and using the robot to take orders and provide other customer services.

These relentless efforts to enhance cardholder experience will allow MA to gain more market share from Visa and American Express.

3) MA's better outlook compared to Visa's

Relative sentiment for MA over V has improved following V's lower core 2016 revenue guidance. V's net revenue growth will now be 7~8%, down from a low-double digits previously. V also lowered EPS guidance to low-double digits from low-end of mid-teens.

In addition, V has issues around Visa Europe Acquisition that was announced on November 2015. V is paying its European counterpart $23.4 billion and is raising as much as $16 billion in debt. Additional leverage would create a noticeable burden on the company's interest expense. In addition, the transformation means that the banks that now own V can switch their portfolios to MA if they can get better deals from MA.

Valuation

MA Comparable Company Analysis

Company Name	Ticker	Share Price	Change Since 1/1/2016	% 52-Wk High	Market Cap (in $ MN)	Firm Value (in $ MN)	FV / EBITDA 2015	FV / EBITDA 2016	FV / EBITDA 2017	P/E 2015	P/E 2016	P/E 2017	PEG 2015	PEG 2016	PEG 2017
Visa Inc. Class A	V	$75.16	(3.1%)	92.0%	$154,297	$195,219	18.4x	17.4x	15.2x	25.0x	27.4x	23.4x	1.8x	1.7x	1.5x
PayPal Holdings Inc	PYPL	35.24	(2.7)	82.8	44,309	38,402	16.2	13.6	11.1	36.2	24.0	20.2	1.6	1.4	1.2
Global Payments Inc.	GPN	69.76	8.1	88.4	13,861	10,431	18.6	11.9	11.5	25.3	20.2	16.6	1.4	1.2	0.9
Total System Services, Inc.	TSS	50.81	2.0	89.6	9,102	10,290	12.6	9.6	8.1	25.3	18.0	15.9	1.7	1.4	1.3
First Data Corp Class A	FDC	10.56	(3.4)	68.7	24,805	31,677	10.0	8.5	8.7	--	8.1	7.0	1.0	0.5	0.5
Mean			(5.9%)	82.3%			15.2x	12.4x	10.9x	28.0x	19.5x	16.6x	1.5x	1.3x	1.1x
Median			(2.7)	88.4			16.2	11.9	11.1	25.3	20.2	16.6	1.6	1.4	1.2
MasterCard Incorporated Class A	MA	$90.42	(7.1%)	88.9	$108,654	$97,162	17.5x	16.2x	14.3x	29.1x	25.8x	22.2x	1.8x	1.7x	1.5x

Source: Company filings and Factset as of June 28, 2016.

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V is the only true comparable company for MA given the similar business model and scale. However, I also considered other processing names: i) Paypal, technology platform that enables digital and mobile payments (Venmo), ii) Global Payments, e-payment process service provider that enable US merchants to accept card based payments at the point-of sale (POS), iii) Total Systems Services, a provider of e-payment process services to card issuers and merchants, iv) First Data, another large card processor owned by KKR.



As shown in the table above, MA is currently trading at ~26x 2016 P/E. Historically, the card networks have traded at an average P/E at around 20x. MA's premium is well justified given that it is operating in a manageable regulatory environment and scarcity of earnings growth in the market.

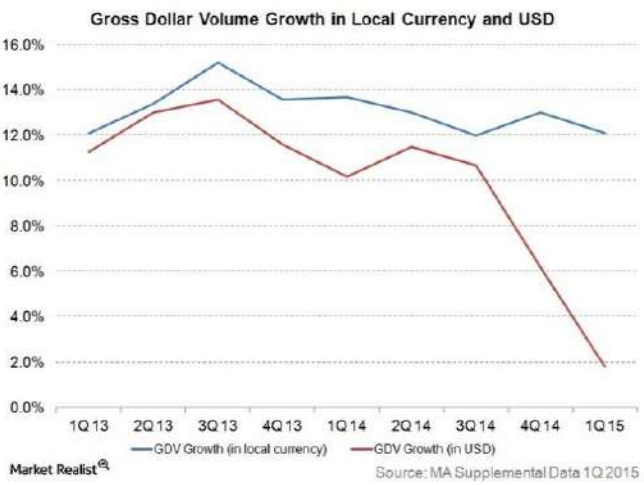
As the graph on the right shows, MA's historical P/E suggests that its current P/E is not exceptionally high or low compared with the historical P/E. MA's P/E has consistently remained lower than V's P/E, and it is higher compared with

American Express (AXP) and Discover Financial (DFS). The Technology Select Sector SPDR P/E is currently near 20.

Investment Risks

1) Continued strengthening of the US dollar

MA has significant and diversified global operations, generating ~60% of its revenues from outside of the US. US only generates 10% of MA's total revenues. Fluctuations in the currency exchange rates significantly impact the company's revenues and net income.



The graph on the left shows the impact of a strong dollar on MA's total volume growth. The growth in the US dollar significantly diverged from the growth in local currency in the most recent quarters. While the volume growth in local currency was 12.1% in 1Q15, it translated into a volume growth of just 1.8% in US dollars.

However, V also faces the impact of a strong US dollar. Given that MA is not the only company with the continued FX headwinds and that MA is aggressively attempting to manage its foreign currency exposures through forward contracts and derivatives, MA continues to present an attractive buy opportunity.

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2) Regulatory and legal risks

The European Union has filed antitrust charges against MasterCard. The EU believes MA is artificially increasing the cost of credit card payments. If successful, MA could be forced to pay 10% of its global revenues in fines. More importantly, MA may be forced to change the way it sets fees for merchants. Merchants regularly complain about high payment processing fees.

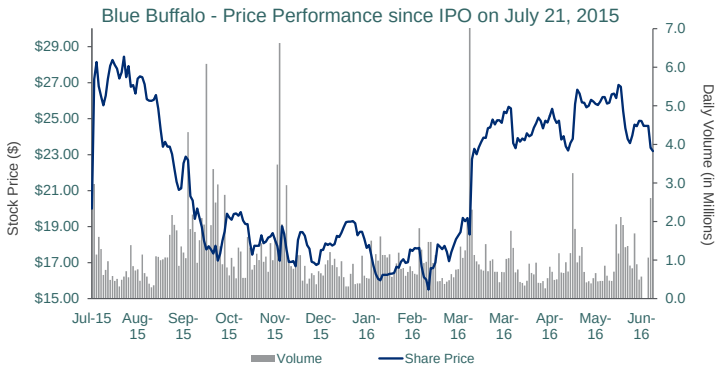
The EU has been investigating interchange for over a decade. This formal charge is just another step in a very long and bureaucratic process. The EU certainly seems intent on capping interchange fees at a much lower level.

However, MA, with its effectively managed and structured litigation risk mechanism, will continue to fight the case vigorously.

3) Bank Consolidation

The banking industry has undergone rapid consolidation. This will result in a smaller number of large customers, which could increase the bargaining power of MA's customers. So this consolidation could lead to lower prices and/or more favorable terms for MA's customers. Any such lower prices and/or more favorable terms could materially and adversely affect MA's revenue and profitability.

Stock Pitch – LONG Recommendation for Blue Buffalo Pet Products, Inc. ["BUFF" / NASDAQ]



Buy	
Price (June 28, 2016)	US$23.20
Target Price	US$33.00
Expected Share Price Return	42.2%
Expected dividend yield	0.0%
Expected Total Return	**42.2%**
Market Cap	US$4,638M
52 Week Range	US$15.19 - US$28.80
Shares Outstanding	196.2M
Float	61.3M
Short Interest / % of float	12.1M / 19.8%
3-Mth Avg Daily Trading Volume	1,231,029

Recommendation

I recommend buying Blue Buffalo, the fastest growing pet food company in the US, which currently trades at $23.20 per share. My 12 month target price for Blue is $33 based on DCF and public comparable analysis.

My investment thesis includes its 1) robust fundamental outlook 2) dominant market position, and 3) superior operating margin.

Key investment risks include 1) Legal risk given the outstanding Nestle Purina lawsuit, 2) heightened competitive risk, and 3) highly concentrated customer list. I believe that the market has overemphasized the financial impact of #1 and #2 and that these risks seem manageable for Blue. As for #3, however, I do believe that the possible loss of major customers presents a major threat to the Company. I could mitigate this risk via protective put options or covered calls, or by longing the stock of peer consumer companies that offers products in the same segment but does not have a concentrated customer list.

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Company Background

Blue sells dog and cat food made with whole meats, fruits and vegetables, and other high-quality, natural ingredients. Blue's strong brand positioning has catapulted it to a 6% market share of the overall $26 billion pet food industry (5th largest player), which has grown at a CAGR of 5% between 2004 and 2014. In the $4.4 billion Wholesome Natural market segment, Blue is the #1 player with 34% market share. The segment has grown at a +20% 3-year CAGR aided by pet humanization trend.

Blue operates in a highly branded category with low private label penetration. The category also has advantageous low switching rates and the end customers display a subscription type purchasing pattern. These allow a degree of increased certainty about Blue's revenue streams. Net sales have grown from $190 million in 2010 to $918 million in 2014, representing a CAGR of 48%.

International sales only accounts for 3% of the company's sales. In the midst of deteriorating growth rates in emerging markets and continued FX headwinds, Blue is an attractive pure play in US stocks.

Blue's primary channels include national and regional pet specialty retailers including PETCO, PetSmart and Pet Valu. The company has also made prudent channel expansion in e-commerce and veterinary.

Investment Thesis

1) Robust fundamental outlook

Many consumer staples companies have been lately struggling with top-line organic growth. Blue, however, is a clear contrast. The Company recently reiterated their long-term growth algorithm of 10%+ revenue growth and 20% EPS growth. Given that Blue feed only 2~3% of the 164 million pets in the US, there is a tremendous upside. With a proven new user acquisition strategy, Blue is capable of converting more pet parents into *True Blue Believers*.

Pet food is a mega CPG category with strong fundamentals driven by a deep emotional bond and secular macro trends. In addition, I believe that the Wholesome Natural segment is at an early stage, leading to a longer sustained runway of growth.

2) Dominant market position

Wholesome Natural market accounted for 17% of the Pet Food industry as of 2014 with Blue having 4 times more market share than the next largest brand, Wellness (Wellpet). In addition, Freshpet, a pure play natural pet food company and a direct BUFF competitor, is much smaller ($571 million market cap) and not as scaled relative to Blue.

Furthermore, Blue has identified and leveraged a fundamental discontinuity in the marketplace. It started to build a strong relationship with vets who are the leading influencer in pet food selection. It also offers broad product portfolio to satisfy each pet's specific dietary, lifestyle and life-stage needs. As a result, the Company successfully increased brand loyalty and stickiness among its customers.

3) Superior operating margin

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Other manufacturers have taken notice that Blue has been successful in rapidly gaining market share in the attractive pet food market. Competitors, such as Purina Pro Plan, have taken aggressive actions through promotional activity, advertising, and innovation. Thus, Blue's stock has tumbled as investors began to fear that the Company would be forced to respond aggressively, diminishing its margins. However, there has been no signs of such destructive activities, raising the idea that the concerns have been overblown. Blue's promotional activity in Pet Specialty channel appears to be relatively consistent.

The company is facing increases in strategic initiatives spending (vet and international), investments in trade spending, and final redundant co-packer costs. However, the new in-house Heartland manufacturing facility will help offset these impacts on the company's gross margins. In addition, the management will continue to focus on cost cutting measures to drive its earnings growth. I expect Blue's operating margin to rise +160bps to 19.4%.

Valuation

I valued Blue using discounted cash flow analysis to derive my $33 price target. I also looked at relative value against a collection of comparable companies as a supporting methodology. My DCF assumes roughly 8.4% sales growth, discounted at 6.2% WACC.

BUFF Discounted Cash Flow Analysis	Historical		Projected							
	2013E	2014E	2015E	2016E	2017E	2018E	2019E	2020E	2021E	2022E
Revenue	$720	$918	$1,027	$1,164	$1,286	$1,416	$1,545	$1,670	$1,797	$1,929
Revenue Growth		27.5%	11.9%	13.3%	10.5%	10.1%	9.1%	8.1%	7.6%	7.4%
Cost of Sales	(422)	(551)	(607)	(661)	(735)	(790)	(855)	(906)	(960)	(1,015)
Gross Profit	**298**	**367**	**420**	**503**	**551**	**626**	**690**	**764**	**837**	**914**
Gross Margin (%)	*41.4%*	*40.0%*	*40.9%*	*43.2%*	*42.8%*	*44.2%*	*44.7%*	*45.7%*	*46.6%*	*47.4%*
EBIT (Adj)	**160**	**187**	**200**	**253**	**304**	**391**	**434**	**474**	**516**	**559**
EBIT Margin (Adj) (%)	*22.2%*	*20.3%*	*19.5%*	*21.8%*	*23.6%*	*27.6%*	*28.1%*	*28.4%*	*28.7%*	*29.0%*
Tax Expense	(62)	(71)	(76)	(96)	(115)	(149)	(165)	(180)	(196)	(213)
Tax Rate (%)	*38.8%*	*38.0%*	*38.0%*	*38.0%*	*38.0%*	*38.0%*	*38.0%*	*38.0%*	*38.0%*	*38.0%*
After-tax EBIT	**98**	**116**	**124**	**157**	**188**	**242**	**269**	**294**	**320**	**347**
+ Depreciation & Amortisation	1	5	8	11	16	17	18	20	22	23
+ Capital Expenditures	(64)	(33)	(23)	(56)	(24)	(13)	(14)	(13)	(15)	(17)
+/- Changes in Working Capital	(29)	(34)	32	(7)	(6)	(2)	(3)	(3)	(2)	(5)
Unlevered Free Cash Flow	**6**	**54**	**141**	**105**	**174**	**244**	**270**	**298**	**325**	**348**
Terminal Value										**8,619**
Discounted Cash Flow			**133**	**93**	**145**	**192**	**200**	**208**	**213**	**5,542**

Discounted Cash Flow	$6,726	EBITDA exit	14.8x
- Net Debt	(243)	Sales CAGR	9.4%
Implied Equity Value	6,483	EBIT CAGR	15.8%
Shares Outstanding	196	Weighted Average Cost of Capital	6.2%
Implied Share Price	**$33.04**		

Source: Company filings.

On a relative basis, I compare BUFF to the following: (i) companies with natural and organic food offering including White Wave Foods and Hain Celestial; (ii) companies with a pet food offering including Smucker and Freshpet; (iii) high growth companies across the consumer sector including Nike, Starbucks, Monster Beverage, Under Armour, Mead Johnson, Whole Foods, Lululemon, Sprouts Farmers Markets, Boston Beer, and The Container Store. Comps are trading at a median 2017 EV/EBITDA of 13.2x, which I used it to calculate my terminal value in DCF analysis. My $33 price target implies 1.4x PEG and 15.2x 2017 EV/EBITDA.

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BUFF Comparable Company Analysis

Descending by Market Cap

	Company Name	Ticker	Share Price	Change Since 7/21/2015	% 52-Wk High	Market Cap (in $ MN)	Firm Value (in $ MN)	FV / EBITDA			P/E			PEG		
								2015	2016	2017	2015	2016	2017	2015	2016	2017
Nat-ural	WhiteWave Foods Company	WWAV	$44.16	(11.5%)	84.1%	$6,858	$10,058	20.2x	16.9x	14.7x	41.4x	31.9x	27.4x	2.1x	1.8x	1.5x
	Hain Celestial Group, Inc.	HAIN	47.78	(29.5)	67.6	6,758	5,765	14.5	14.2	12.4	40.7	23.7	21.3	1.8	1.6	1.5
Pet Food	J. M. Smucker Company	SJM	146.98	36.9	99.7	13,861	22,805	13.5	12.6	11.8	22.0	22.9	21.3	3.0	2.8	2.6
	Freshpet Inc	FRPT	9.07	(50.8)	43.4	285	304	27.2	16.6	12.4	NM	NM	38.5	NM	NM	1.5
High Growth	NIKE, Inc. Class B	NKE	53.09	(6.0)	77.9	87,131	91,458	16.9	15.1	13.2	27.5	22.6	19.7	1.7	1.5	1.3
	Starbucks Corporation	SBUX	54.85	(2.4)	85.7	86,121	83,121	18.2	15.8	14.0	31.9	29.8	25.7	1.8	1.5	1.3
	Monster Beverage Corporation	MNST	154.46	7.2	96.2	30,224	28,923	30.4	24.5	21.2	52.5	39.8	33.2	2.4	1.8	1.5
	Under Armour, Inc. Class A	UA	37.52	(17.8)	35.4	17,420	18,317	33.1	27.2	21.4	76.8	68.2	49.5	2.9	2.7	2.0
	Mead Johnson Nutrition Company	MJN	86.27	(2.1)	93.9	14,724	17,463	16.3	16.8	15.8	24.1	24.9	23.0	3.2	3.1	2.9
	Lululemon Athletica Inc	LULU	69.87	11.3	95.4	9,130	9,273	20.9	18.4	15.8	32.8	33.1	28.0	2.3	1.9	1.6
	Sprouts Farmers Markets, Inc.	SFM	21.97	(14.7)	73.2	4,057	3,561	11.6	10.5	8.7	32.0	23.0	19.7	1.5	1.3	1.1
	Boston Beer Company, Inc. Class A	SAM	163.35	(26.6)	62.7	2,620	2,097	10.0	11.1	10.6	28.3	24.5	23.0	2.8	3.1	2.9
	The Container Store Group, Inc.	TCS	5.07	(72.1)	26.4	253	558	8.2	7.5	6.8	47.9	21.7	17.4	1.0	0.5	0.4
	Mean			(13.7%)	72.4%			18.5x	15.9x	13.8x	38.2x	30.5x	26.7x	2.2x	2.0x	1.7x
	Median			(11.5)	77.9			16.9	15.8	13.2	32.4	24.7	23.0	2.2	1.8	1.5
	Blue Buffalo Pet Products Inc	BUFF	$23.20	16.0%	80.6	$3,671	$4,718	21.8x	17.9x	15.2x	41.6x	31.9x	27.8x	1.9x	1.6x	1.4x

Source: Company filings and Factset as of June 28, 2016.

Investment Risks

1) Legal risk given the outstanding Nestle Purina lawsuit

On May 2014, Nestle filed a lawsuit against Blue, alleging that Blue has engaged in false advertising, commercial disparagement and unfair competition. While Blue has brought 3rd party indemnity and

damage claims (potential settlement value of $32 million) against the supplier who mislabeled ingredients, Blue might not be able to recover the full amount of damages if the court finds in favor of Nestle.

Even though the market is pricing in sizable damages claim, Blue maintains insurance coverage for some of the Nestle's claims. In addition, I believe that such contingent liabilities are not expected to have a material effect on Blue's strong financial position, operations, or brand.

2) Heightened competitive risk

The attractive growth profile of the wholesome natural category will continue to attract fierce competitors. For instance, there has been shelf space gains by Natural Balance (now owned by SJM) at PetSmart. In addition, Nestle recently required Merick Pet Care, one of the fastest-growing natural and organic pet food companies. Moreover, there is continued PetSmart inventory destocking and higher promotional spending in the superstore channel that drove sales down 2%.

However, Blue's recent performance indicates that competitive landscape still seems manageable. Blue cited year over year market gains of 24bps and roughly flat sequential market share (Q3 from Q2) across all channels, driven by substantial share gains in e-commerce and in the farm & feed channel. Moreover, sell-in will track sell-through at PetSmart over time, driving growth recovery there with US and international distribution opportunities and favorable mix supporting the 10%+ growth target.

3) Highly Concentrated Customer List

Blue's customer list is highly concentrated, with Pet superstores combined representing ~73% of total Blue's sales. Consequently, the loss of business at one of Blue's major customers could impose detrimental impact on Blue's results.

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To hedge against this risk, I could buy protective put options on Blue's stock at a strike price of $20.88 to limit the losses to 10%. I could also long the stock of a competitor that is focused on the same segment but with more diverse customer list.