



THE OHIO STATE UNIVERSITY

FISHER COLLEGE OF BUSINESS

Stock Presentation

Information Technology Sector

Student Investment Management

Presenters:

Sweta Sahu
Harry Pan

November 20th, 2016



Agenda

Recommendation

Sector Overview

Analysis of Stocks

Conclusion

Recommendation



Company Ticker	Recommendation
GOOGL	HOLD
AAPL	HOLD
DVMT	BUY
MSFT	HOLD
MU	SELL
VNTV	HOLD
CTSH	BUY

Sector	S&P 500 weight	SIM current weight	SIM proposed weight
Information Technology	21.2%	19.6%	20.6%

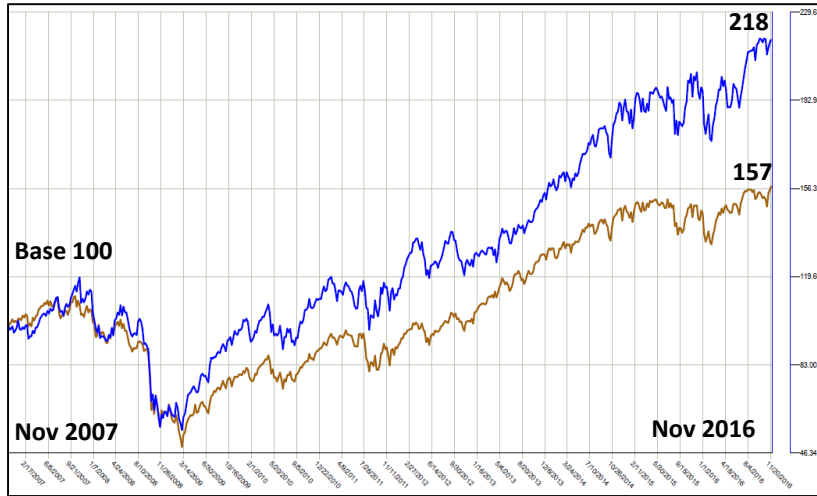
Security	Ticker	Sub Sector	Market Cap (\$B)	Stock Price (\$)	Recommendation	Current Weight	Proposed Weight	Change
ALPHABET INC-CL A	GOOGL	Software & Services	529.1	760.5	HOLD	4.7%	4.7%	0
APPLE INC	AAPL	Technology & Hardware	586.8	110.1	HOLD	4.9%	4.9%	0
DELL TECHNOLOGIES INC	DVMT	Technology & Hardware	11.5	52.0	BUY	1.0%	2.0%	100 bps
MICROSOFT CORP	MSFT	Software	469.2	60.4	HOLD	1.1%	1.1%	0
MICRON TECHNOLOGY INC	MU	Semiconductors	20.0	19.2	SELL	3.2%	0.0%	-320 bps
VANTIV INC	VNTV	Software & Services	11.3	59.3	HOLD	4.6%	4.6%	0
COGNIZANT TECH SOLUTIONS	CTSH	IT Services	33.7	53.9	BUY	0.0%	3.2%	320 bps

Information Technology Sector



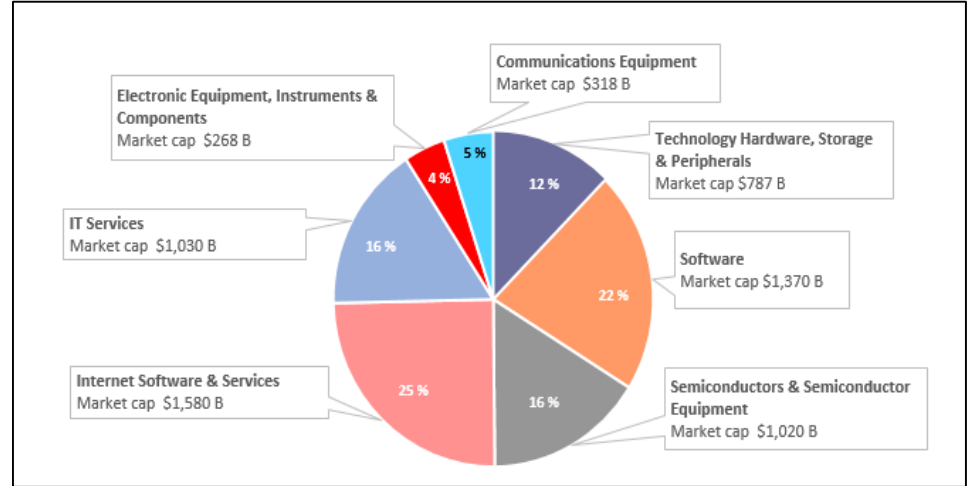
Sector	Market Cap	3 Month % Change	1 Year % Change
Information Technology	\$6.3T	3.3%	8.1%
S&P 500 Index	\$19.9T	-2.8%	1.5%

Information Technology & S&P 500 Index.



— S5INFT Index

— SPX Index





Vantiv Inc.

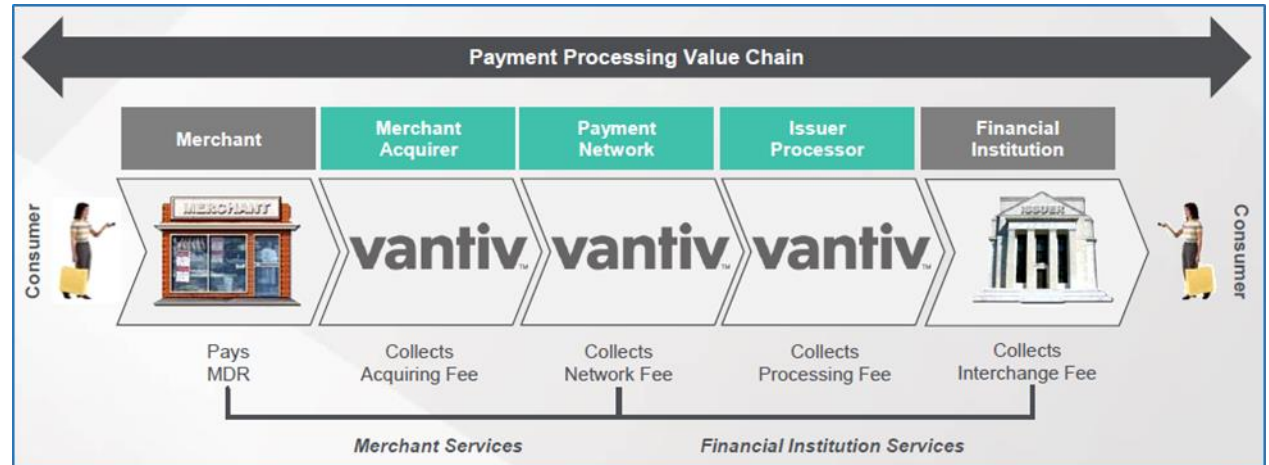
Vantiv: Stock Overview



Stock Ticker	VNTV
Recommendation	HOLD
Current Price	\$ 53.96
Implied equity value/share	\$ 55.99
Upside/(Downside) to DCF	3.8%

Vantiv, Inc. is an integrated payment processor. The Company enables merchants of all sizes accept and process credit, debit, prepaid payments and also provide them supporting services. Payment processors create and manage the technology infrastructure that enables electronic payments.

Analyst: Sweta Sahu
Date: 20/09/16



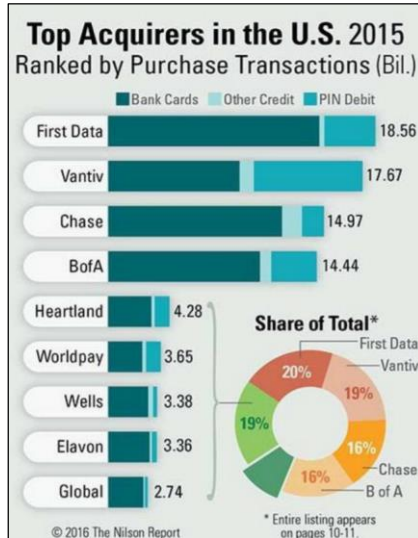
Source: Vantiv IR Presentation

Vantiv: Key business drivers & Revenue projections



Business Segments: Vantiv has two segments, Merchant Services (79% of Revenue) and Financial Institution Services (21% of Revenue)

Market Share



Revenue projections

Number of Transactions (Billions)					
Year	2015	2014	2013	2012	2011
Year	2015	2014	2013	2012	2011
First Data	18.4	17.8	10.0	16.7	6.1
Vantiv	17.7	15.5	12.1	11.2	4.7
Change YoY	14%	28%	8%	138%	-
Bank of America	14.4	14.2	14.1	13.5	9.6
Chase	15.0	13.5	10.2	9.1	6.6
Heartland	4.3	3.8	3.5	3.3	2.0
Elavon	3.4	3.5	-	2.6	2.0
Worldpay	3.7	3.3	-	2.7	-
Wells Fargo	3.4	2.8	-	2.1	1.4
Global Payments	2.7	2.5	-	2.1	2.0
Citi	-	-	6.5	-	5.8
TSYS	-	-	-	1.3	1.0
Top 5 Merchant Acquirers	69.7	64.8	52.9	53.8	32.8
Growth YoY	7.6%	22.5%	-1.7%	63.8%	

Source: Bloomberg

No. of transactions:

- Industry growth rate is 7.6%.
- Vantiv's growth rate in last two years is 28% and 14%.

SEGMENTATION

Small Business potential market size (In Millions) **10**
(Greater than 4 employees and less than 49)

Merchant locations Vantiv in 2015 0.80

Market share of Vantiv in 2015 19%

Current market penetration **4**

MERCHANT SERVICES	2018 E	2017 E	2016 E	2015	2014	2013	2012	2011
Transactions (Millions)	24,327	22,525	20,760	18,959	16,262	13,333	11,912	9,591
Change YoY	8.0%	8.5%	9.5%	16.6%	22.0%	11.9%	24.2%	

FINANCIAL INSTITUTION SERVICES	2018 E	2017 E	2016 E	2015	2014	2013	2012	2011
Transactions (Millions)	4,641	4,428	4,226	4,032	3,815	3,613	3,450	3,344
Change YoY	4.8%	4.8%	4.8%	5.7%	5.6%	4.7%	3.2%	

Vantiv: Competitive Advantage, Risks & Valuation



Competitive Advantage

- Defensive business model.
- Consumers have become accustomed to using credit and debit cards instead of cash.
- Highly scalable business and strong scale efficiencies .
- Vantiv is executing very well by penetrating different channels.
- There is lot of competition and many new entrants on the front end side (POS terminals, Mobile and ecommerce terminals) but not on the back end side.
- Recurring transaction fee revenue.

Risks:

- Pricing pressure.
- Increased competition from existing competitors
- Cybersecurity threat.

Relative Valuation

Ticker	P/E TTM	P/S TTM	P/B	P/CF TTM	EV/ EBITDA TTM
Average	37.97	4.96	7.03	17.12	15.14
Your Ticker	59.37	2.39	9.65	12.24	16.87
Peers					
First Data Corp	--	--	18.74	--	15.91
JP Morgan Chase & Co	13.06	2.44	1.08	13.62	--
Bank of America Corp	12.26	1.85	0.68	2.20	--
Heartland Payment Systems Inc	--	--	--	--	14.43
Global Payments Inc	33.48	3.46	4.27	16.28	24.06

- Average comprises of following companies:
 - VANTIV INC - CL A
 - TOTAL SYSTEM SERVICES INC
 - GLOBAL PAYMENTS INC
 - FIRST DATA CORP- CLASS A
 - FLEETCOR TECHNOLOGIES INC
 - WEX INC
 - SQUARE INC - A
 - BLACKHAWK NETWORK HOLDINGS I
 - GREEN DOT CORP-CLASS A
 - FIDELITY NATIONAL INFO SERV
 - MASTERCARD INC-CLASS A
 - VISA INC-CLASS A SHARES
 - FISERV INC
 - PAYPAL HOLDINGS INC

Based on P/E multiple, Vantiv's stock price appears expensive compared to industry average because of higher P/E.

Vantiv: DCF Valuation



VANTIV INC. (VNTV) - DCF

Analyst: Sweta Sahu

Date: 20/09/16

Terminal Discount Rate = 9.0%

Terminal FCF Growth = 4.5%

Year	2016E	2017E	2018E	2019E	2020E	2021E	2022E	2023E	2024E	2025E	2026E
Total Revenue	3,545	3,895	4,249	4,546	4,842	5,132	5,414	5,685	5,941	6,208	6,488
% Growth		9.9%	9.1%	7.0%	6.5%	6.0%	5.5%	5.0%	4.5%	4.5%	4.5%
Operating Profit (EBIT)	526	636	734	808	884	963	1,043	1,124	1,204	1,289	1,380
Operating Margin	14.8%	16.3%	17.3%	17.8%	18.3%	18.8%	19.3%	19.8%	20.3%	20.8%	21.3%
Interest	106	106	106	106	106	106	106	106	106	106	106
Interest % of Total Revenue	3.0%	2.7%	2.5%	2.3%	2.2%	2.1%	1.9%	1.9%	1.8%	1.7%	1.6%
Taxes	121	152	181	232	254	277	300	323	346	371	397
Tax Rate	28.8%	28.8%	28.8%	28.8%	28.8%	28.8%	28.8%	28.8%	28.8%	28.8%	28.8%
Net Income (Consolidated companies)	300	378	447	470	525	581	638	695	752	813	877
Minority Interest	73	92	109	114	128	141	155	169	183	198	213
% of Total Net Income	24.3%	24.3%	24.3%	24.3%	24.3%	24.3%	24.3%	24.3%	24.3%	24.3%	24.3%
Net Income (Vantiv Inc)	227	286	339	356	397	439	483	526	569	615	664
% Growth		26.1%	18.5%	5.0%	11.6%	10.7%	9.8%	9.0%	8.2%	8.1%	7.9%
Add Depreciation	93	102	111	119	126	134	141	148	155	162	169
% of Total Revenue	2.6%	2.6%	2.6%	2.6%	2.6%	2.6%	2.6%	2.6%	2.6%	2.6%	2.6%
Add Amortization	192	171	162	154	81	17	17	17	17	17	17
Plus/(minus) Changes WC	(70)	(38)	(38)	(41)	(44)	(46)	(49)	(51)	(54)	(56)	(59)
% of Total Revenue	-2.0%	-1.0%	-0.9%	-0.9%	-0.9%	-0.9%	-0.9%	-0.9%	-0.9%	-0.9%	-0.9%
Subtract Cap Ex	95	104	114	122	130	138	145	152	159	166	174
Capex % Total Revenue	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%
Free Cash Flows to Equity (FCFE)	346	416	459	465	431	407	447	488	529	572	618
% Growth		20.2%	10.3%	1.2%	-7.2%	-5.7%	9.9%	9.1%	8.4%	8.2%	8.1%

Terminal Value	14,350
Free Cash Yield	4.31%
Terminal P/E	21.6
Terminal EV/EBITDA	11.2

NPV of Cash Flows	3,020	33%
NPV of terminal value	6,062	67%
Projected Equity Value	9,082	100%
Free Cash Flow Yield	3.96%	

Current P/E	38.6	30.6	25.9
Projected P/E	40.1	31.8	26.8
Current EV/EBITDA	17.0	15.1	13.7
Projected EV/EBITDA	18.0	16.0	14.5

Diluted Shares Outstanding (Consolidated)	197.3
Diluted Shares Outstanding (Vantiv Inc.)	162.2

Current Price	\$ 53.96
Implied equity value/share	\$ 55.99
Upside/(Downside) to DCF	3.8%



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Cognizant Technology Solutions Corp.

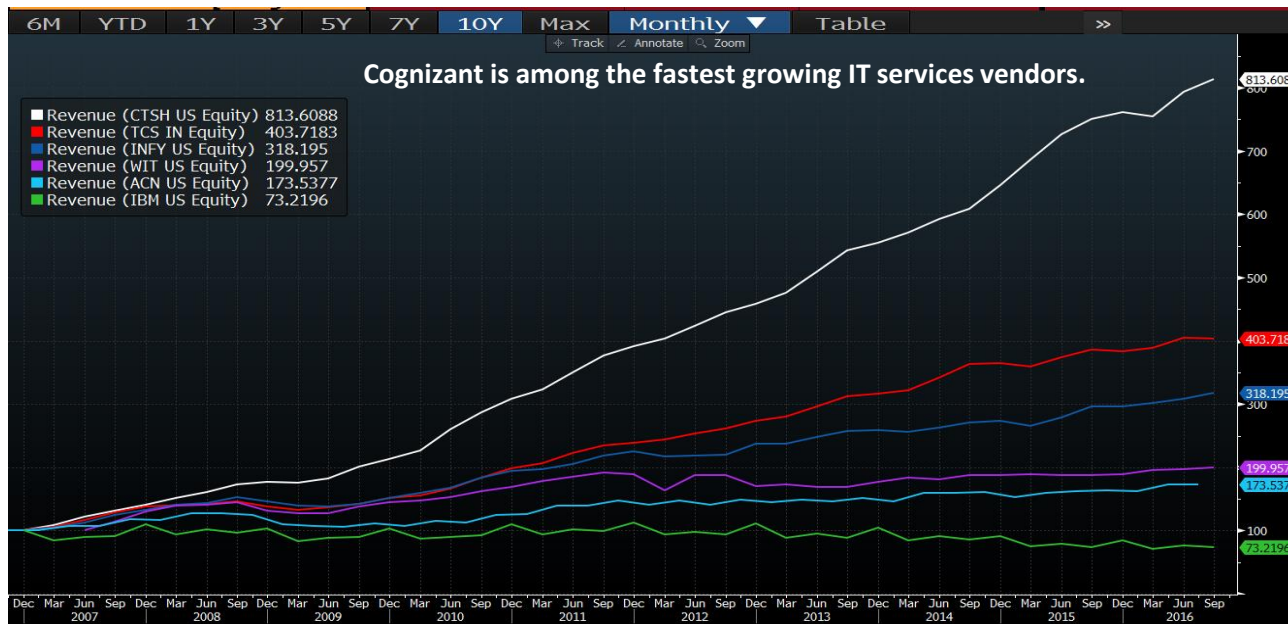
Cognizant: Stock Overview



Stock Ticker	CTSH
Recommendation	BUY
Current Price	\$ 53.94
Implied equity value/share	\$ 64.56
Upside/(Downside) to DCF	19.7%

Cognizant Technology Solutions Corporation provides custom information technology (IT) consulting and technology services, as well as outsourcing services. The Company's core competencies include technology strategy consulting, complex systems development, enterprise software package implementation and maintenance, data warehousing, and business intelligence.

Analyst Sweta Sahu
Date: 11/11/16



Cognizant: Business Segments & Competitive Advantage

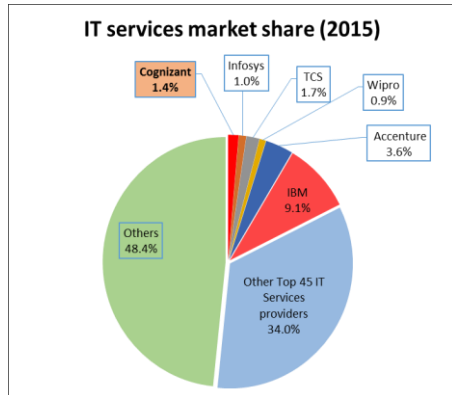


Business Segments:

Industry Business Segments	% of revenue (2015)
Financials (Banking and Insurance)	40%
Healthcare (Life Sciences and Healthcare)	30%
Manufacturing, Retail and Logistics	19%
Other*	11%

* includes Communications, Media and Entertainment etc.

Geography	% of revenue (2015)
North America	79%
Europe	16%
Others	5%



Source: Bloomberg Intelligence

Competitive Advantage:

Porter five forces:

- Threat of new entrants is low.
- Threat of substitute is low.
- Bargaining power of suppliers is low to medium.
- Bargaining power of buyers is medium.
- Industry rivalry is high.
- In summary, Cognizant has competitive advantages of scale and increasing switching costs of its customers.

Cognizant's differentiated strategy:

- Cognizant has a 2-in-1 operating organizational model where two managers are equally responsible for executing on complex IT projects. Having key relationship managers (marketing managers) at these client location enables Cognizant to better serve the customer's needs. Which in turn helps Cognizant's to grow revenue by penetrating into existing customer IT services budget.
- Deep focus on financial service and healthcare IT services leading to scale advantages and niche domain expertise.
- Use of reinvestment strategy to grow by keeping their operating margins 18%-20% which is lower than their peers.
- Cognizant has performed several acquisitions in the last 10 years (e.g. AimNet, Trzetto) and have been opportunistic in their share repurchases.

Cognizant: Total Addressable Market & Revenue projections



Total Addressable Market:

Year	2015	2020E	CAGR ('15-'20)
Global IT services spending (\$B)	903	1,088	3.8%
Global Healthcare IT spending (\$B)	104	130	5.7%
Global Financial Services IT spending (\$B)	461	543	4.2%
Others	338	415	-

Source: Bloomberg Intelligence

Fundamental drivers for IT in Financial Services & Healthcare

- Modernize old software applications using latest software, hardware and cloud computing platforms.
- For example, bank customers are demanding services to be delivered to their smartphones.
- Another example, provide better service to patients by making healthcare information accessible online and on smartphones.

Year	2013	2014	2015
Sales Growth (%)			
Cognizant	20.4	16.1	21.0
Infosys	24.2	6.4	17.1
TCS	29.9	15.7	14.8
Wipro	16.0	8.1	9.1
IBM	(5.9)	(5.7)	(11.9)
Accenture	4.9	3.3	5.7
Capgemini	(1.7)	4.8	12.7
HCL	22.8	25.7	14.2
CGL Group	111.3	4.1	(2.0)
ATOS	(2.6)	5.1	18.1
HP	(6.0)	(3.9)	(5.5)
XEROX CORP	(8.0)	(2.3)	(7.7)
AMDOCS LTD	3.0	6.5	2.2
COMPUTER SCIENCES CORP	(8.4)	(37.6)	(12.5)
TECH MAHINDRA LTD	174.0	20.1	17.1
GENPACT LTD	12.1	6.9	8.0
SYNTEL INC	13.9	10.5	6.3
EPAM SYSTEMS INC	28.0	31.5	25.2
INDRA SISTEMAS SA	(0.9)	0.8	(3.0)
Median Industry Growth	12.1	6.4	8.0
Cognizant over the Median	8.3	9.7	13.0

- Cognizant has grown at 8% to 13% above the IT services industry median revenue growth in the past 3 years.
- Additionally, Cognizant has only 1.4% market share (addressable market \$903B) indicating there is much more room to grow.

Source: Bloomberg Intelligence

Year	FY10	FY11	FY12	FY13	FY14	FY15	FY16E	FY17E	FY18E
Revenue YoY	40.1%	33.3%	20.0%	20.4%	16.1%	21.0%	9%	10%	11%
Financial Services	38.2%	29.5%	20.5%	22.5%	15.3%	16.7%	9.0%	10.0%	11.5%
Healthcare	36.8%	37.8%	19.3%	17.0%	18.7%	36.4%	9.0%	11.0%	12.5%
Manufacturing/Retail/Logistics	50.4%	40.9%	25.2%	24.7%	12.1%	12.0%	9.0%	9.0%	9.0%
Other	39.1%	26.1%	12.1%	13.1%	20.3%	17.4%	9.0%	9.0%	9.0%
Operating Margin per segment					18.4%	17.3%	16.2%	17.4%	18.2%
Financial Services	34.4%	34.6%	32.9%	32.6%	30.8%	32.8%	32.5%	33.0%	33.0%
Healthcare	37.1%	38.5%	37.4%	36.6%	31.6%	32.7%	31.5%	32.5%	33.5%
Manufacturing/Retail/Logistics	33.4%	36.8%	35.2%	33.7%	32.8%	34.2%	33.0%	33.0%	33.0%
Other	33.5%	32.4%	32.8%	32.1%	32.8%	32.4%	32.0%	33.0%	33.0%
Unallocated Costs as a % of Revenue	0%	0%	0%	-15%	-13%	-16%	-16.0%	-15.5%	-15.0%

Cognizant: Valuation Multiples, Risks & Consensus Rating



Valuation Multiples	P/E TTM	EV/EBITDA TTM	P/S TTM	P/B	P/CF TTM
Average	16.6	11.4	3.0	3.8	16.1
Large Offshore-Centric Providers					
Cognizant	17.5	12.0	2.4	3.1	16.0
Infosys	16.5	10.3	3.5	3.6	17.0
TCS	18.6	14.2	4.1	6.0	19.8
Wipro	13.7	9.1	2.2	2.4	11.7
Global Service Providers					
Accenture	21.7	12.7	2.1	9.9	15.7
IBM	10.8	10.1	1.8	8.5	7.8

Cognizant P/E ratio is slightly higher than average.

Risks:

- Increased competition from existing players.
- Macroeconomic slowdown in North America.
- Macroeconomic or political disturbances in India.
- Larger impact of the Foreign Corrupt Practice Act (FCPA) issue than the \$5M impact as guided by Cognizant's management in Q3 2016 earnings call.
- Management turnover at Cognizant.

Cognizant Technology Solutions Corp		
Consensus Rating		4.37
Buys	71.4%	25
Holds	25.7%	9
Sells	2.9%	1
12M Tgt Px	27/36	64.44
Last Price		55.10
Pricing Currency		USD
Return Potential		17.0%
LTM Return		-15.4%

Date: November 21, 2016

Cognizant: DCF Valuation



COGNIZANT TECHNOLOGY											
Ticker: CTSH US Equity											
Analyst: Sweta Sahu											
Date: 11/11/16											
Terminal Discount Rate = 11.0%											
Terminal FCF Growth = 4.5%											
Figures in \$ millions, except per share											
Year	2016E	2017E	2018E	2019E	2020E	2021E	2022E	2023E	2024E	2025E	2026E
Revenue	13,533	14,886	16,531	18,267	20,093	22,002	23,982	25,901	27,714	29,238	30,554
% Growth		10.0%	11.1%	10.5%	10.0%	9.5%	9.0%	8.0%	7.0%	5.5%	4.5%
Operating Income (EBIT)	2,198	2,583	3,001	3,288	3,597	3,916	4,245	4,559	4,850	5,087	5,286
Operating Margin	16.2%	17.4%	18.2%	18.0%	17.9%	17.8%	17.7%	17.6%	17.5%	17.4%	17.3%
Interest and Other	(66)	(66)	(66)	(66)	(66)	(66)	(66)	(66)	(66)	(66)	(66)
Taxes	565	661	765	804	881	961	1,043	1,121	1,194	1,253	1,303
Tax Rate	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%
Net Income	1,699	1,988	2,301	2,418	2,650	2,889	3,136	3,371	3,590	3,768	3,917
% Growth		17.0%	15.8%	5.1%	9.6%	9.1%	8.5%	7.5%	6.5%	5.0%	4.0%
Add Depreciation/Amort	338	359	381	410	436	465	500	535	567	594	618
Plus/(minus) Changes WC	(219)	(252)	(290)	(303)	(313)	(321)	(325)	(326)	(321)	(309)	(292)
% of Sales	-1.6%	-1.7%	-1.8%	-1.7%	-1.6%	-1.5%	-1.4%	-1.3%	-1.2%	-1.1%	-1.0%
Subtract Cap Ex	297	327	363	401	441	483	527	569	609	642	616
Free Cash Flow	1,521	1,768	2,029	2,124	2,331	2,550	2,784	3,011	3,227	3,411	3,626
% Growth		16.2%	14.8%	4.7%	9.7%	9.4%	9.2%	8.2%	7.2%	5.7%	6.3%

Terminal Value	58,295
Free Cash Yield	6.22%
Terminal P/E	14.9
Terminal EV/EBITDA	9.2

NPV of Cash Flows	14,790	42%
NPV of terminal value	20,530	58%
Projected Equity Value	35,321	100%
Free Cash Flow Yield	4.63%	

Current P/E	19.3	16.5	14.3
Projected P/E	23.1	19.8	17.1
Current EV/EBITDA	11.4	9.8	8.5
Projected EV/EBITDA	13.9	12.0	10.4

Shares Outstanding **608.5**

Current Price	\$53.94
PV of FCF/share	\$58.05
Net Cash/share	\$6.51
Implied equity value/share	\$64.56
Upside/(Downside) to DCF	19.7%



Micron Technology

Micron Technology: Stock Overview



Stock Overview



Recommendation: SELL

Ticker	MU
Sector	Information Technology
Industry	Memory Semiconductor
Current Price (USD) as of (11/28/2016)	\$20.13
Price Target (USD)	\$13.00
Current / Proposed Weight	3.20% / 0.00%
Dividend Yield	N/A
Downside	36%

Market Data

Market Capitalization (USD)	\$20.97B
Shares Outstanding	\$1.04B
52-week Price Range	\$9.31 - \$20.44
Beta	1.72

Financial Data (FY2015)

Revenue (USD)	\$12.40B
Revenue Growth (YoY)	-23.40%
Operating Income (USD)	-\$208M

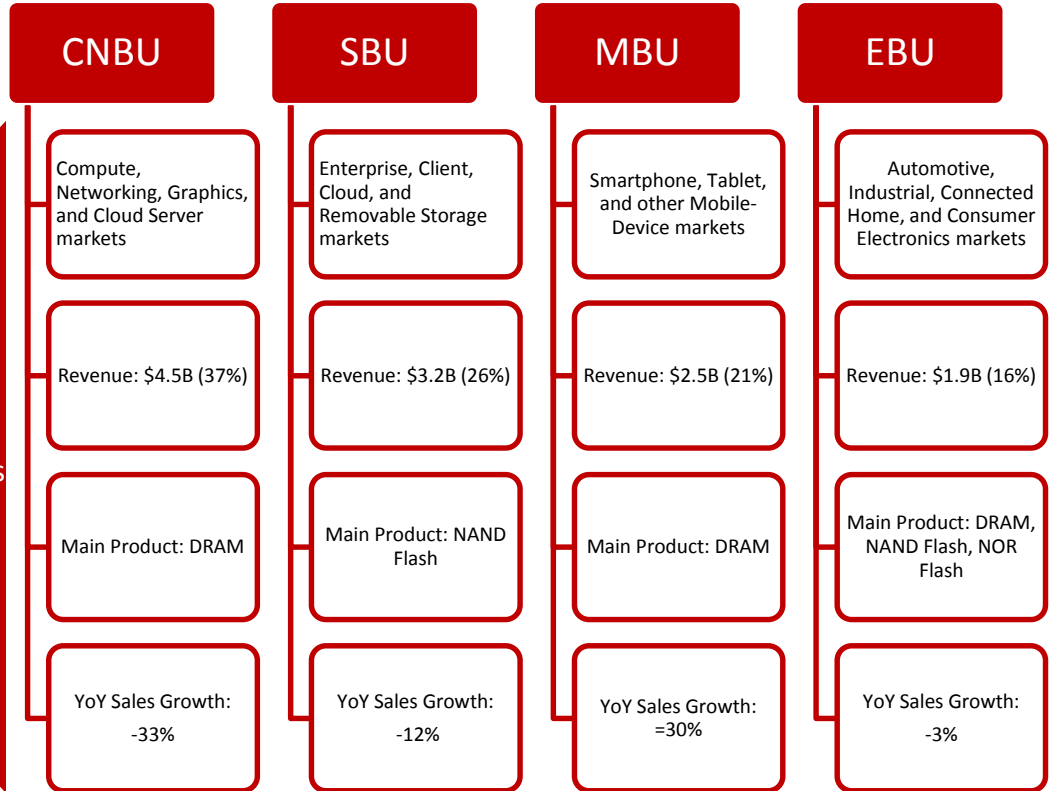
Micron Technology: Company Overview



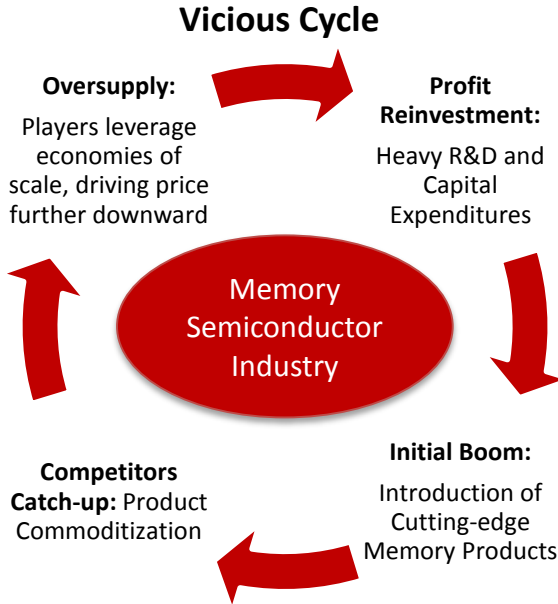
Micron Technology

Micron Technology is a provider of semiconductor solutions headquartered in Boise, Idaho. The company manufactures and markets a portfolio of silicon-to-semiconductor solutions, including foundational DRAM, NAND Flash and NOR Flash memory, as well as other memory technologies. The company operates in four main business segments: Compute and Networking Business Unit (CNBU), Mobile Business Unit (MBU), Storage Business Unit (SBU), and Embedded Business Unit (EBU).

Figure 1:
Business
Segments



Micron Technology: Business Analysis



Average Selling Prices Decrease YoY

	DRAM	Trade Non-Volatile
2016 from 2015	-35%	-20%
2015 from 2014	-11%	-17%
2014 from 2013	6%	-23%
2013 from 2012	-11%	-18%
2012 from 2011	-45%	-55%

No Substantive Competitive Advantage

Little Product Differentiation

- Commoditization is a Norm

Competition

- Conglomerates (Samsung) + Governments (China)
- No match in Resources and Capital

Unsustainable Profits

- Vicious Cycle
- High Reinvestment Ratio
- Oversupply

Micron Technology Revenue (in billions) by Geographic Region

	2016		2015	
	Revenue	% of Total Sales	Revenue	% of Total Sales
China	\$ 5,301	42.8%	\$ 6,658	41.1%
United States	1,925	15.5%	2,565	15.8%
Asia Pacific	1,610	13.0%	2,037	12.6%
Taiwan	1,521	12.3%	2,241	13.8%
Europe	937	7.6%	1,248	7.7%
Japan	831	6.7%	1,026	6.3%
Other	274	2.2%	417	2.6%
Total	\$12,399	100.0%	\$16,192	100.0%

Micron Technology: Financial Analysis



Sum-of-Parts Forecast by Business Unit

	Projected Annual Forecast			Actual						
	FY 19E	FY 18E	FY 17E	FY 16P	FY 15P	FY 14P	FY 13P	FY 12P	FY 11P	FY 10P
Change in Sales YoY	4.05%	4.33%	20.81%	-24.20%	78.46%	80.29%	10.19%	-6.30%	3.61%	
<i>Consensus</i>	4.10%	4.30%	21.00%							
Segment										
CNBU - Sales YoY	2.00%	1.00%	24.00%	-32.65%	-8.29%	111.81%	29.81%	-16.73%	-30.94%	
MBU - Sales YoY	2.00%	1.00%	24.00%	-30.42%	1.79%	198.76%	3.23%	-39.97%	151.80%	
SBU - Sales YoY	8.00%	10.00%	15.00%	-11.53%	5.95%	23.23%	-0.63%	29.42%	3.93%	
EBU - Sales YoY	5.00%	8.00%	20.00%	-3.00%	12.68%	39.14%	16.23%	9.48%	92.32%	
All Other - Sales YoY	0.00%	0.00%	0.00%	12.36%	-38.19%	-51.68%	-34.07%	5.61%	-0.93%	
Operating Margin	18.29%	16.54%	12.89%	1.35%	18.52%	18.87%	2.60%	-7.43%	8.59%	18.73%
<i>Change YoY</i>	1.75%	3.65%	11.53%	-17.16%	-0.36%	16.27%	10.03%	-16.02%	-10.14%	
Segment										
CNBU - OM	25.00%	20.00%	10.00%	-2.96%	22.02%	26.69%	4.62%	-17.17%	9.05%	27.36%
<i>Change YoY</i>	5.00%	10.00%	12.96%	-24.98%	-4.67%	22.07%	21.79%	-26.23%	-18.31%	
MBU - OM	16.00%	17.00%	18.00%	1.52%	30.50%	18.83%	-21.83%	-31.55%	1.02%	-2.96%
<i>Change YoY</i>	-1.00%	-1.00%	16.48%	-28.98%	11.67%	40.66%	9.72%	-32.57%	3.98%	
SBU - OM	10.00%	9.00%	8.00%	-6.28%	-2.41%	7.33%	6.13%	7.00%	12.25%	11.36%
<i>Change YoY</i>	1.00%	1.00%	14.28%	-3.87%	-9.74%	1.20%	-0.88%	-5.25%	0.89%	
EBU - OM	20.00%	20.00%	20.00%	22.33%	21.76%	18.66%	17.80%	11.76%	23.65%	29.17%
<i>Change YoY</i>	0.00%	0.00%	-2.33%	0.57%	3.10%	0.85%	6.04%	-11.89%	-5.52%	
All Other - OM	30.00%	30.00%	30.00%	35.00%	50.56%	-96.53%	-19.80%	-24.56%	-14.25%	-11.34%
<i>Change YoY</i>	0.00%	0.00%	-5.00%	-15.56%	147.09%	-76.73%	4.76%	-10.31%	-2.91%	

Sum-of-Parts Projection

CNBU

- Main Product: DRAM
- ST Outlook: Positive – eased supply glut
- LT Outlook: Negative – price decrease

MBU

- Main Product: DRAM
- ST Outlook: Positive – eased supply glut
- LT Outlook: Negative – price decrease

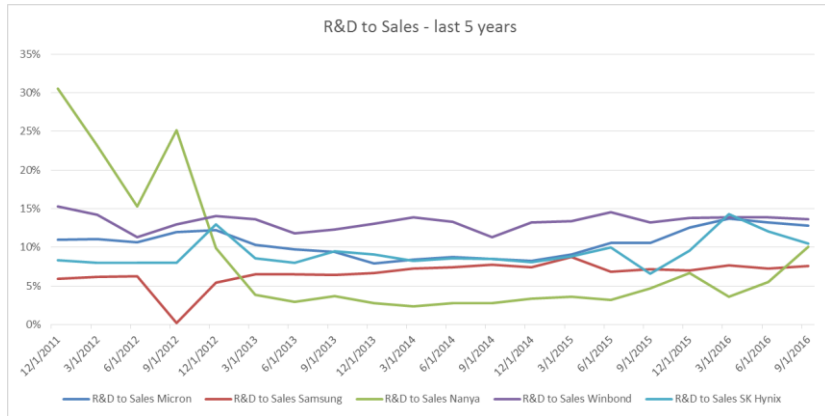
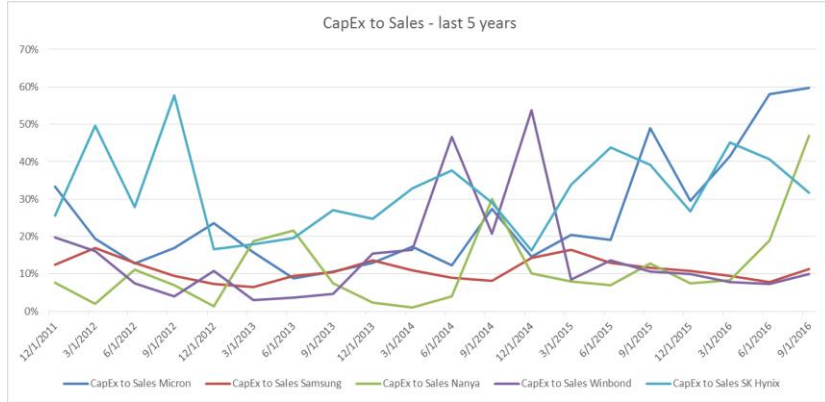
SBU

- Main Product: NAND Flash
- ST Outlook: Positive – SSD Demand
- LT Outlook: Negative – commoditization

EBU

- Main Product: Mix
- ST Outlook: Neutral
- LT Outlook: Negative

Micron Technology: Financial Analysis



Micron has a higher level of capital expenditures and R&D expenses relative to sales compared to peers but yet this does not result in a better earning number.



Normalized Historical EPS (12/31/2011 as base 100)

Micron Technology: Valuation Multiples



P/B	Micron	SK Hynix	Samsung	Nanya	Winbond
Average	1.76	1.66	1.23	0.77	9.45
Median	1.61	1.73	1.17	0.83	3.87
Max	3.46	2.38	1.70	1.21	38.33
Min	0.75	0.95	0.84	0.44	0.74
Current	1.79	1.37	1.19	0.84	1.97

P/E	Micron	SK Hynix	Samsung	Nanya	Winbond
Average	46.22	217.12	8.96	20.28	14.25
Median	9.14	9.07	9.37	13.77	6.10
Max	361.88	4009.74	12.07	114.29	78.19
Min	N/A	N/A	6.38	N/A	N/A
Current	16.29	13.73	11.57	12.17	19.49

P/E, P/S, and P/CF valuation multiples all indicate that Micron is currently trading at a premium from its historical median, while its peers appear to be fairly traded or traded at a discount from their historical median.

P/S	Micron	SK Hynix	Samsung	Nanya	Winbond
Average	1.29	1.61	0.93	0.87	2.37
Median	1.26	1.60	0.94	0.81	2.61
Max	2.16	2.13	1.18	1.16	3.96
Min	0.71	1.21	0.81	N/A	N/A
Current	1.37	1.85	1.18	0.85	3.06

P/CF	Micron	SK Hynix	Samsung	Nanya	Winbond
Average	5.19	4.90	4.60	3.66	6.26
Median	5.14	4.72	4.32	3.78	1.31
Max	9.89	8.27	6.30	5.48	40.03
Min	2.60	2.38	3.69	1.60	N/A
Current	6.48	4.98	4.32	3.90	5.70

Micron Technology: DCF Valuation



Discounted Cash Flow Model for Micron Technology

Analyst: Harry Pan

Date: 11/15/2016

Terminal Discount Rate = 12.00%

Terminal FCF Growth = 5.00%

Year	Projected Annual Forecast									
	FY 17E	FY 18E	FY 19E	FY 20E	FY 21E	FY 22E	FY 23E	FY 24E	FY 25E	FY 26E
<i>(Millions except for per earnings per share)</i>										
Revenue	14,980	15,629	16,262	17,807	19,410	21,060	22,745	24,337	25,797	27,087
% Growth		4.33%	4.05%	9.50%	9.00%	8.50%	8.00%	7.00%	6.00%	5.00%
Operating Income	1,930	2,585	2,975	3,028	3,106	3,160	3,185	3,530	3,870	4,199
Operating margin	12.89%	16.54%	18.29%	17.00%	16.00%	15.00%	14.00%	14.50%	15.00%	15.50%
Other non-operating income (expesne), net	(65)	(68)	(71)	59	64	69	75	80	85	89
ONOI(ONOE) as % of sale	-0.44%	-0.44%	-0.44%	0.33%	0.33%	0.33%	0.33%	0.33%	0.33%	0.33%
Interest	(477)	(498)	(518)	(370)	(404)	(438)	(473)	(506)	(537)	(563)
Interest as % of sale	-3.19%	-3.19%	-3.19%	-2.08%	-2.08%	-2.08%	-2.08%	-2.08%	-2.08%	-2.08%
Taxes (provision) benefits	(278)	(404)	(477)	(543)	(553)	(558)	(557)	(621)	(684)	(745)
Tax rate	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%
Net Income	1,110	1,616	1,909	2,173	2,213	2,233	2,229	2,483	2,735	2,980
% Growth		45.49%	18.15%	13.84%	1.85%	0.89%	-0.15%	11.37%	10.16%	8.96%
Add Depreciation/Amortization	3,900	4,069	4,234	3,289	3,688	4,107	4,549	5,111	5,546	5,959
% of Sales	26.03%	26.03%	26.03%	18.47%	19.00%	19.50%	20.00%	21.00%	21.50%	22.00%
Plus/(minus) Changes WC	(374)	(63)	(61)	(237)	(258)	(280)	(303)	(324)	(343)	(360)
% of Sales	-2.50%	-0.40%	-0.38%	-1.33%	-1.33%	-1.33%	-1.33%	-1.33%	-1.33%	-1.33%
Subtract Cap Ex	7,327	7,645	7,955	4,778	5,047	5,265	5,572	5,719	5,804	5,959
Capex % of sales	48.92%	48.92%	48.92%	26.83%	26.00%	25.00%	24.50%	23.50%	22.50%	22.00%
Free Cash Flow	(2,691)	(2,023)	(1,874)	447	596	794	903	1,551	2,134	2,620
% Growth		24.81%	7.40%	123.88%	33.30%	33.22%	13.73%	71.65%	37.61%	22.77%

NPV of Cash Flows **814** 6.04%

NPV of Terminal Value **12,653** 93.96%

Projected Equity Value **13,467**

Free Cash Flow Yield **-12.85%**

Current P/E **18.86** **12.96** **10.97**

Projected P/E **12.13** **8.34** **7.06**

Current EV/EBITDA **4.77** **4.18** **3.86**

Projected EV/EBITDA **3.49** **3.06** **2.82**

Shares Outstanding 1,036

Current Price **\$ 20.21**

Implied equity value/share **\$ 13.00**

Upside/(Downside) to DCF **-35.68%**

Debt **9,154**

Cash **2,287**

Cash/share **2.21**

Terminal Value **39,298**

Free Cash Yield **6.67%**

Terminal P/E **13.2**

Terminal EV/EBITDA **4.5**

Micron Technology: Recommendation



Rating: SELL
Price Target: \$13.00

Investment Thesis:

- Highly cyclical and capital-intensive industry
- No substantive competitive advantage
- New technological development easily commoditized

Risks:

- Potential M&A target as the industry continues to consolidate
- R&D investment may create competitive advantage in the future
- Artificial low interest rate has decreased the market discount rate

		Equity Value per share						
		Terminal Discount Rate						
		10.50%	11.00%	11.50%	12.00%	12.50%	13.00%	13.50%
Terminal Growth Rate	3.50%	\$ 14.88	\$ 13.28	\$ 11.90	\$ 10.70	\$ 9.64	\$ 8.71	\$ 7.88
	4.00%	\$ 16.01	\$ 14.22	\$ 12.69	\$ 11.37	\$ 10.22	\$ 9.20	\$ 8.31
	4.50%	\$ 17.33	\$ 15.31	\$ 13.60	\$ 12.13	\$ 10.86	\$ 9.75	\$ 8.78
	5.00%	\$ 18.89	\$ 16.58	\$ 14.64	\$ 13.00	\$ 11.59	\$ 10.37	\$ 9.31
	5.50%	\$ 20.76	\$ 18.08	\$ 15.86	\$ 14.00	\$ 12.43	\$ 11.07	\$ 9.91
	6.00%	\$ 23.05	\$ 19.87	\$ 17.30	\$ 15.17	\$ 13.39	\$ 11.88	\$ 10.58
	6.50%	\$ 25.91	\$ 22.07	\$ 19.02	\$ 16.55	\$ 14.51	\$ 12.80	\$ 11.35

Sensitivity Analysis



Dell Technologies Inc.

Dell Technologies Inc. Class V (DVMT): Overview

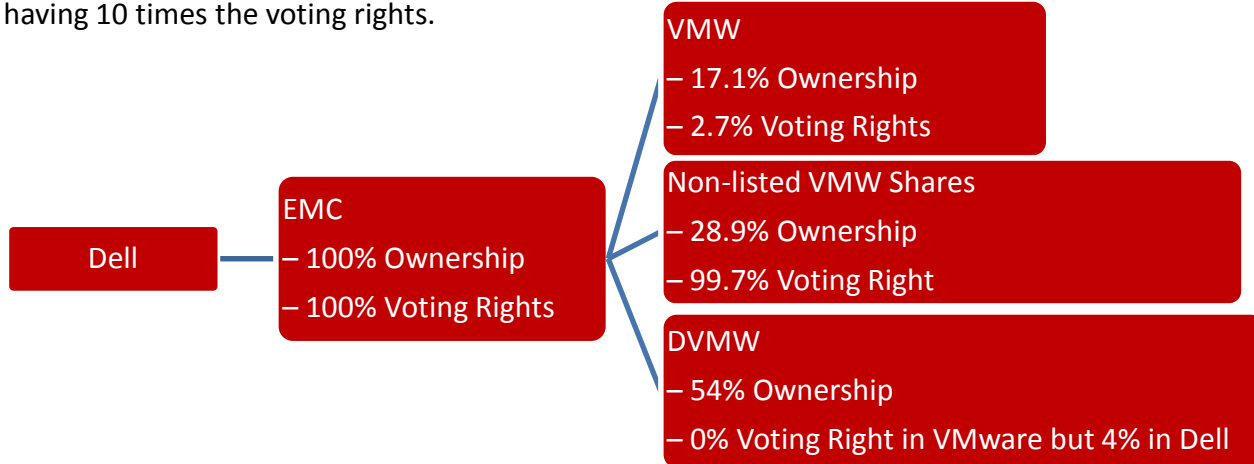


Backdrop:

Effective September 7, 2016, Dell Technologies Inc. acquired EMC Corporation which resulted in a change in control of VMware. As a result of the Dell Acquisition, EMC became a wholly-owned subsidiary of Dell and VMware became an indirectly-held, majority-owned subsidiary of Dell, with Dell controlling 82.9% of the outstanding shares.

Creation of the Tracking Stock:

To help finance the deal, Dell had issued a new class of tracking stocks (DVMT US Equity) that will represent 65% of its ownership in VMware. In aggregate, DVMT will represent 54% of VMware's outstanding shares. DVMT has **no direct rights in VMware** and Dell has the right to switch the underlying assets and businesses. Through the structure of a tracking stock, the holders of DVMT will have limited ability to vote for independent director, roughly 3% of voting rights, with the shares owned by Michael Dell and Silver Lake, the buyout firm, having 10 times the voting rights.



Dell Technologies Inc. Class V (DVMT): Recommendation



Trading Strategy: LONG DVMT and SHORT VMW

Investment Thesis:

- Though DVMT has no direct voting rights in VMware, VMW does not have much either (2.7%). Hence, voting rights disparity should not be a reason for the discount.
- Michael Dell took his company private in 2013 to escape capital market pressure, but now DVMT requires the company again to report financial figures publically. Therefore a share buyback is deemed likely.
- Without the concern of a voting rights disparity, DVMT and VMW represent the same underlying assets and businesses of VMware.
- The current short interest (34.39%) in VMware stocks confirm our views and the price convergence is already happening.

Risks:

- Dell has remained the right to change the underlying assets and businesses and the company may choose to do so even though it's remotely unlikely

Px/Chg 1D (USD)	81.07/+1.49%
52 Wk H (11/29/16)	81.23
52 Wk L (02/11/16)	43.25
YTD Change/%	24.50/43.31%
Mkt Cap (USD)	33,365.6M
Shrs Out/Float	111.6M/66.6M
SI/% of Float	22.9M/34.29%
Days to Cover	12.1

VMW short interest



Normalized Price and Spread Chart (8/17/2016 as base 100)



Conclusion

Recommendation

Sector Overview

Analysis of Stocks

Conclusion

Conclusion



Company Ticker	Recommendation
GOOGL	HOLD
AAPL	HOLD
DVMT	BUY
MSFT	HOLD
MU	SELL
VNTV	HOLD
CTSH	BUY

Sector	S&P 500 weight	SIM current weight	SIM proposed weight
Information Technology	21.2%	19.6%	20.6%

Security	Ticker	Sub Sector	Market Cap (\$B)	Stock Price (\$)	Recommendation	Current Weight	Proposed Weight	Change
ALPHABET INC-CL A	GOOGL	Software & Services	529.1	760.5	HOLD	4.7%	4.7%	0
APPLE INC	AAPL	Technology & Hardware	586.8	110.1	HOLD	4.9%	4.9%	0
DELL TECHNOLOGIES INC	DVMT	Technology & Hardware	11.5	52.0	BUY	1.0%	2.0%	100 bps
MICROSOFT CORP	MSFT	Software	469.2	60.4	HOLD	1.1%	1.1%	0
MICRON TECHNOLOGY INC	MU	Semiconductors	20.0	19.2	SELL	3.2%	0.0%	-320 bps
VANTIV INC	VNTV	Software & Services	11.3	59.3	HOLD	4.6%	4.6%	0
COGNIZANT TECH SOLUTIONS	CTSH	IT Services	33.7	53.9	BUY	0.0%	3.2%	320 bps



End of Presentation

Thank You For Listening