



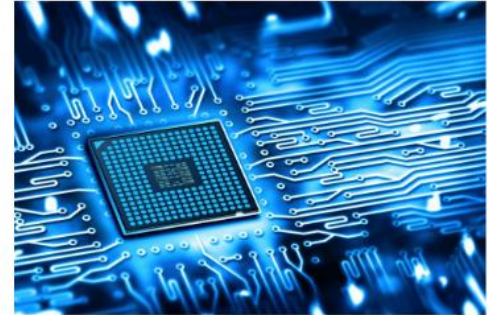
# Information Technology Sector

## *Student Investment Management*

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October 29<sup>th</sup>, 2016



# Agenda

Sector Overview

Business Analysis

Economic Analysis

Financial Analysis

Valuation Analysis

Recommendation



# Sector Overview

Sector Overview

Business Analysis

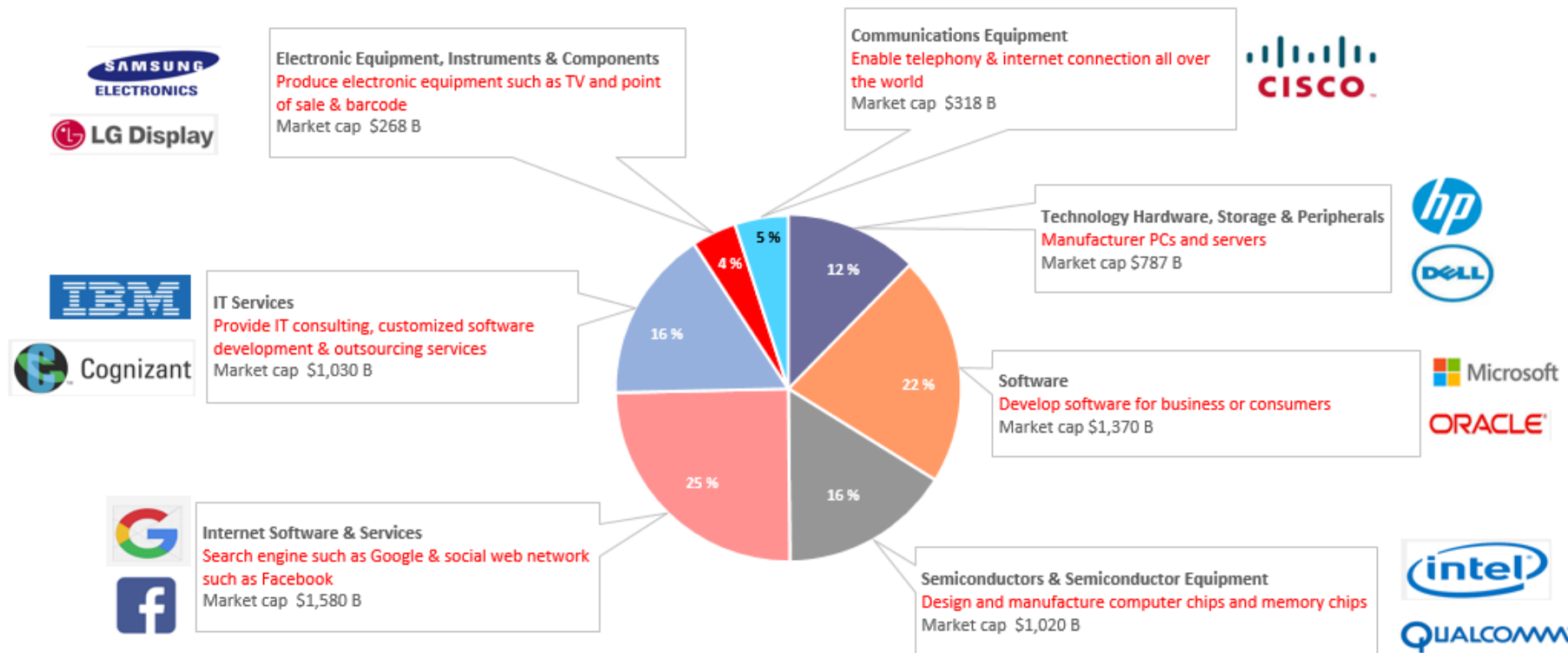
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# Information Technology Sector



# Snapshot



Sector	Market Cap	Members	3 Month % Change	1 Yr % Chg	3 Yr % Chg	5 Yr % Chg	10 Yr % Chg
Information Technology	\$6.3T	67	3.3%	8.1%	46%	88%	127%
S&P 500 Index	\$19.9T	500	-2.8%	1.6%	20%	68%	53%

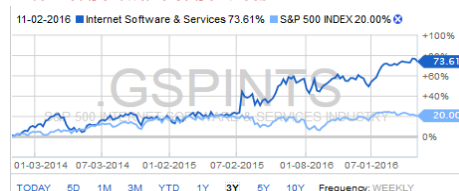
Sector	S&P 500 Weight	SIM Weight	+/-
Information Technology	21.24%	19.25%	-1.99%

Market Cap (\$Billions)	
Apple	586
Google	548
Microsoft	469
Facebook	351
Visa	195

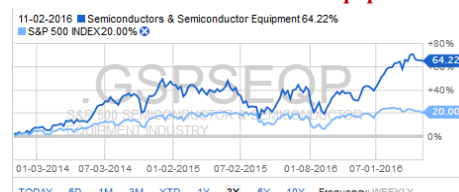
## Industries: Top Five & Bottom Five Performers This Quarter

Top Five Industries in Q3	Sector	Bottom Five Industries in Q3	Sector
Technology Hardware, Storage & Peripherals <b>↑ 20%</b>	Technology	Water Utilities <b>↓ 11%</b>	Utilities
Semiconductors & Semiconductor Equipment <b>↑ 19%</b>	Technology	Tobacco <b>↓ 6%</b>	Consumer Staples
Internet & Direct Marketing Retail <b>↑ 15%</b>	Consumer Discretionary	Independent Power and Renewable Electricity Producers <b>↓ 6%</b>	Utilities
Communications Equipment <b>↑ 14%</b>	Technology	Construction Materials <b>↓ 6%</b>	Materials
Internet Software & Services <b>↑ 13%</b>	Technology	Multiline Retail <b>↓ 6%</b>	Consumer Discretionary

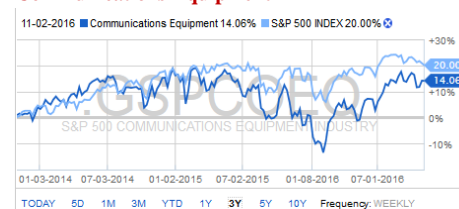
## Internet Software & Services



## Semiconductors & Semiconductor Equipment



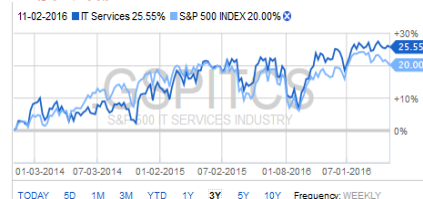
## Communications Equipment



## Software



## IT Services



## Electronics Equipment, Instruments & Components



## Technology Hardware, Storage & Peripherals





# Business Analysis

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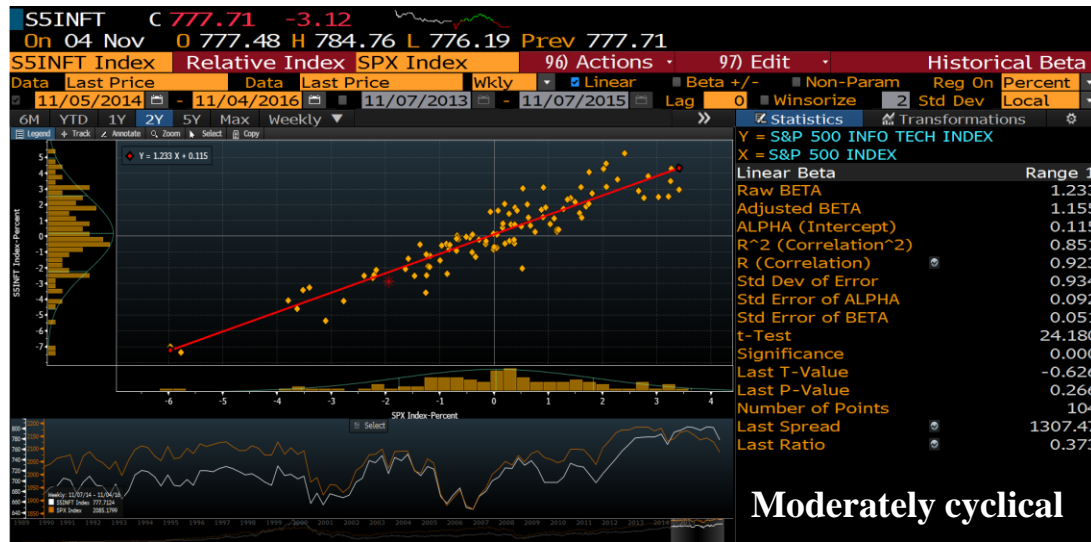
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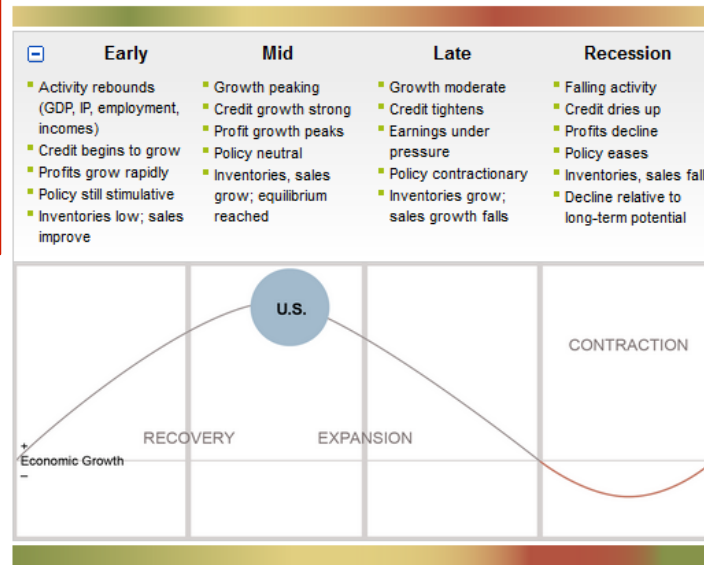
# Business Cycle and Demand Trends



- **Demand Trends:**
- Consumers demanding a better experience (social, mobile, e-commerce).
- Demand for cloud computing, where software applications are centralized on the Internet.
- Increased merger-and-acquisition (M&A) activity in the hardware and semiconductor industries.
- New Product innovations & effective security solutions
- Global prospects continue to be favorable.



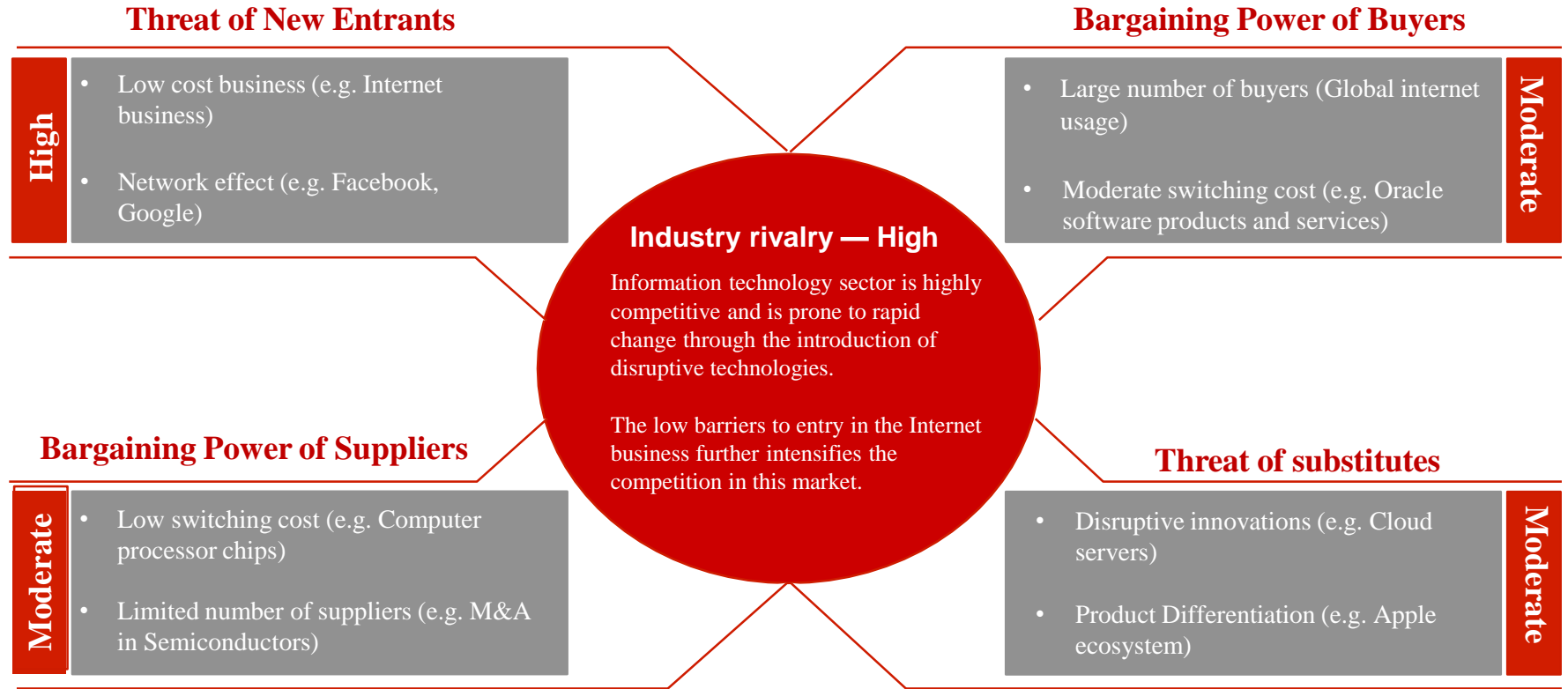
INFLATIONARY PRESSURES / Red=High



Sector	Early	Mid	Late	Recession
Information Technology	+	+	--	--

++ Consistently Overperform    -- Consistently Underperform    □ No Clear Pattern  
 + Overperform    - Underperform

# Porter's Five Forces Analysis







# Economic Analysis

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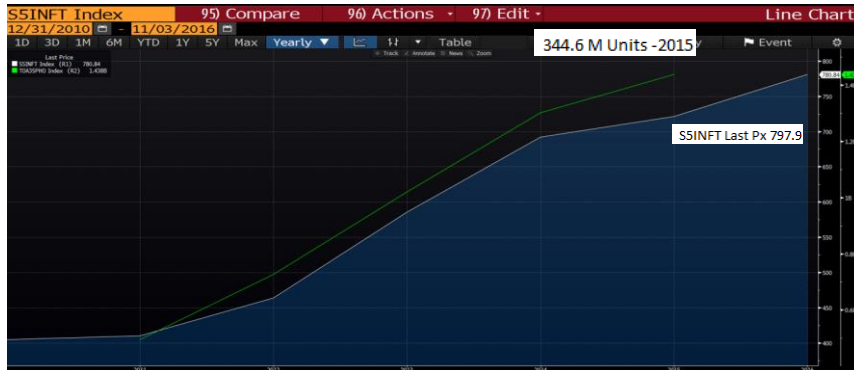
## US GDP (GDP CGWG Index) & IT Sector



## US IT Spending (TOITSSUS Index) & IT Sector



## Smartphones (TOA3SPHO Index) & IT Sector



## US Corporate Profits (CPFTTOT Index) & IT Sector





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# Price Performance and Sales Growth Rate (Sector vs Market)



IT Sector (yellow, CAGR = 8.27%) has been outperforming the broader equity market index S&P 500 (green, CAGR = 4.30%) since 2007.

Similar trend is also observed in the sales growth with IT Sector's CAGR of 4.29% and S&P 500's CAGR of 2.14%.

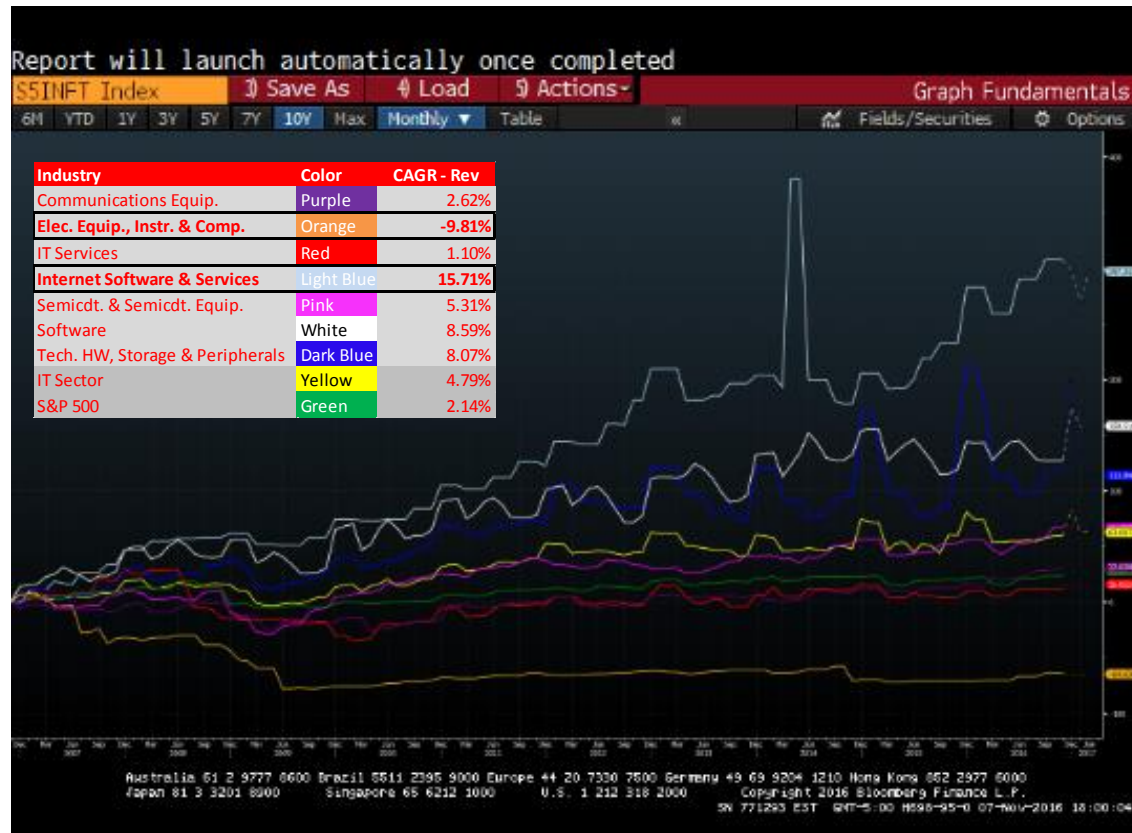
Note: chart is normalized using percentage appreciation

# Margins Comparison (Sector vs Market)



On the margins front, IT Sector has historically enjoyed a higher gross margin (average historical spread(AHS) = 13.51%), operating margin (AHS = 6.63%), and profit margin (AHS = 18.28%).

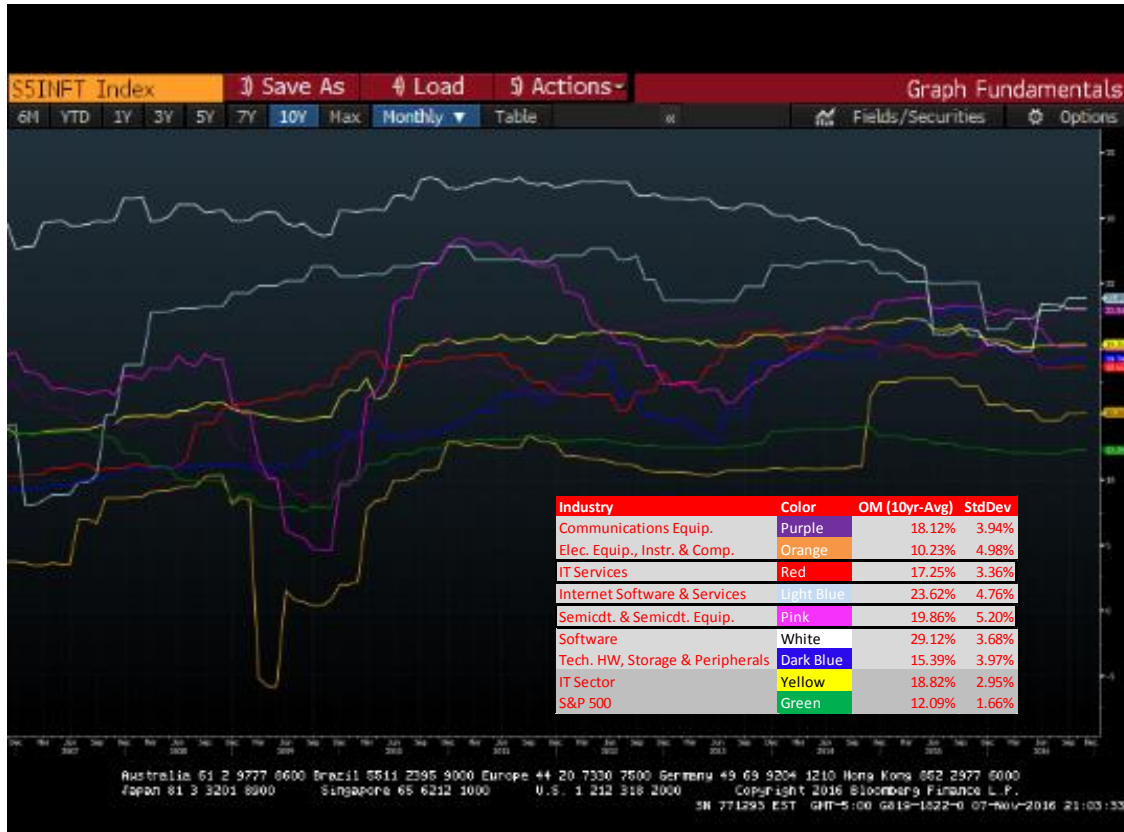
# Sales Growth Rate (Industry vs Sector vs Market)



Within the IT sector, the industries experience varied levels of sales growth rate, with Internet Software & Services leading with 15.71% (CAGR) and Elec. Equip., Instr. & Comp. trailing behind with a decline of 9.81%.

Note: chart is normalized using percentage appreciation

# Operating Margin Comparison (Industry vs Sector vs Market)



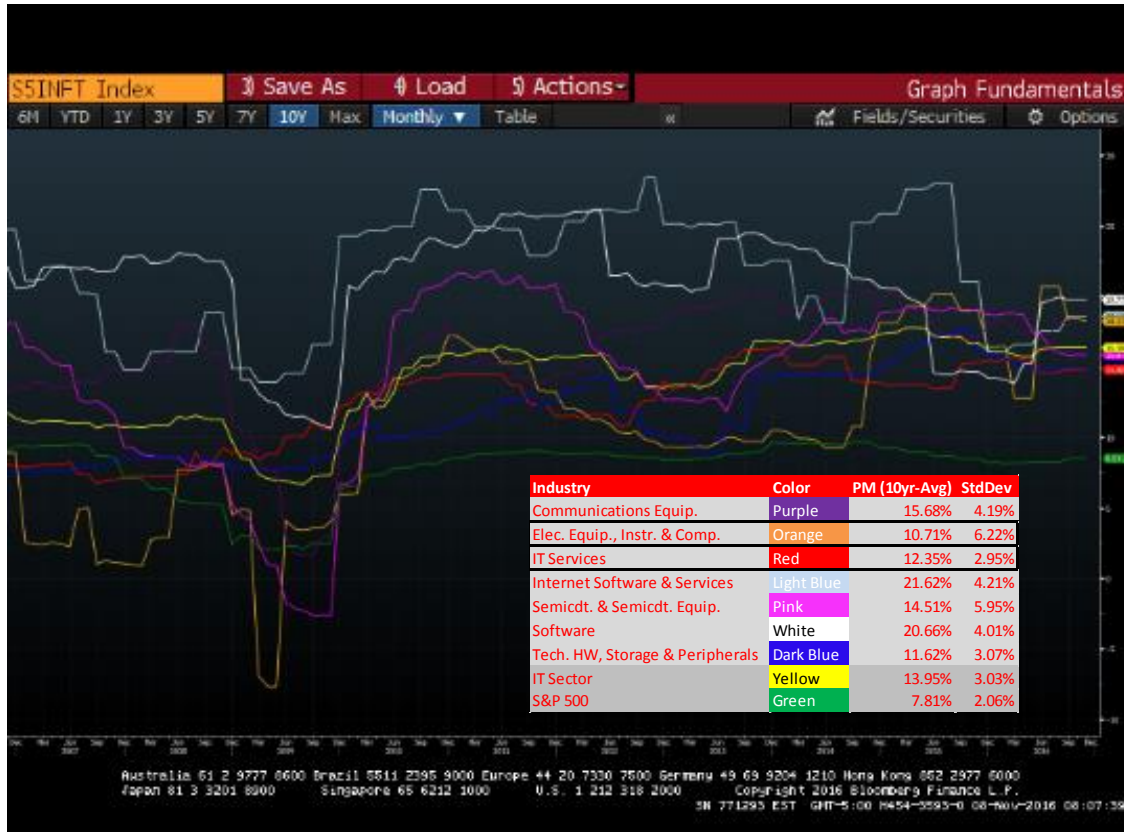
Industries within the IT sector has generally achieved a higher operating margin than that of the S&P 500.

The volatility of the operating margin differs among the industries

A convergence of the operating margin over time can be observed.



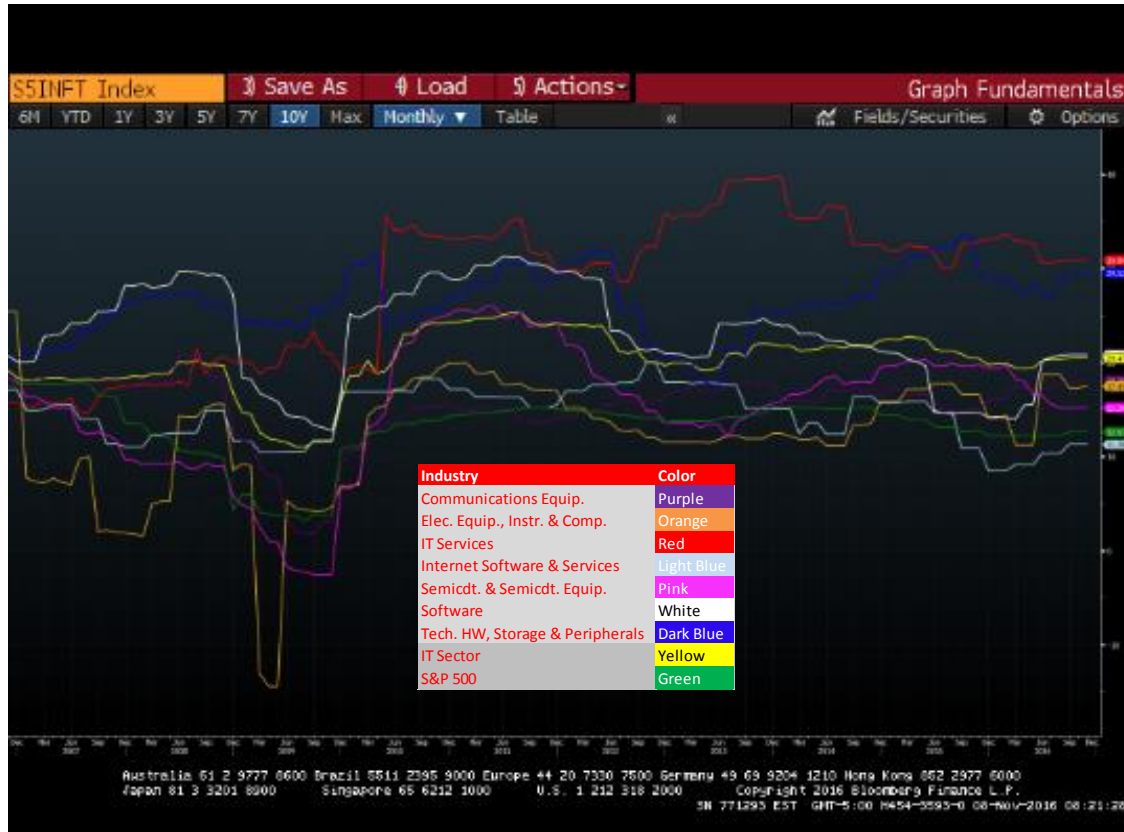
# Profit Margin Comparison (Industry vs Sector vs Market)



Similar trend is also observed at the profit margin level.



# ROE Comparison (Industry vs Sector vs Market)



ROEs for the industries within the IT sector outperform the broader market for the most part historically.

One noticeable observation is that Internet Software & Services, despite having one of the highest margins (both OM and PM), has not translated it into a higher shareholder return.



# Valuation Analysis

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# Price to Earnings



P/E	S5COMM	S5ELEIX	S5ITSV	S5INSSX	S5SSEQ
Mean	19.56	16.12	18.18	29.19	20.49
Median	16.92	16.44	17.59	25.40	17.98
Max	47.80	25.13	29.95	50.50	73.48
Min	12.24	6.62	12.40	16.72	10.47
Current	15.75	19.56	21.00	33.69	21.52

P/E	S5SOFT	S5CMPE	S5INFT	SPX
Mean	18.79	14.81	18.22	16.87
Median	17.60	14.35	18.21	16.82
Max	30.33	23.89	26.39	24.48
Min	11.98	10.01	11.74	12.10
Current	30.33	13.08	21.52	19.92

Software is trading at 72% above its historical median, while Comm. Equip. is trading at 7% below its historical median. S&P 500 and S5INFT are both at 18% above their historical median.

# Price to Sales



P/S	S5COMM	S5ELEIX	S5ITSV	S5INSSX	S5SSEQ
Mean	3.00	1.61	2.27	6.29	2.82
Median	3.03	1.61	2.30	5.75	2.86
Max	4.02	2.86	3.23	10.61	3.86
Min	1.81	0.49	1.21	3.32	1.60
Current	2.89	2.51	3.21	7.64	3.73

P/S	S5SOFT	S5CMPE	S5INFT	SPX
Mean	4.21	1.76	2.65	1.47
Median	4.14	1.72	2.51	1.44
Max	6.00	2.64	3.64	1.94
Min	2.44	0.92	1.40	0.74
Current	5.48	1.97	3.61	1.90

Elec. Equip., Inst. & Comp. is trading at 56% above its historical median, while Comm. Equip. is trading at 4% below its historical median. S&P 500 and S5INFT are at 32% and 44% above their historical medians respectively.

# Price to Book Value



P/B	S5COMM	S5ELEIX	S5ITSV	S5INSSX	S5SSEQ
<b>Mean</b>	2.88	1.94	5.06	3.87	2.88
<b>Median</b>	2.72	2.04	5.61	3.54	2.91
<b>Max</b>	4.69	2.50	7.20	7.03	3.79
<b>Min</b>	2.02	0.97	2.83	2.43	1.85
<b>Current</b>	2.77	2.39	6.39	4.20	3.35

P/B	S5SOFT	S5CMPE	S5INFT	SPX
<b>Mean</b>	4.49	3.91	3.71	2.42
<b>Median</b>	4.36	3.83	3.70	2.41
<b>Max</b>	6.93	5.96	5.06	2.98
<b>Min</b>	3.17	2.56	2.49	1.64
<b>Current</b>	5.80	4.00	4.34	2.76

Industry	Color	Ticker
Communications Equip.	Purple	S5COMM
Elec. Equip., Instr. & Comp.	Orange	S5ELEIX
IT Services	Red	S5ITSV
Internet Software & Services	Light Blue	S5INSSX
Semicond. & Semicond. Equip.	Pink	S5SSEQ
Software	White	S5SOFT
Tech. HW, Storage & Peripherals	Dark Blue	S5CMPE
IT Sector	Yellow	S5INFT
S&P 500	Green	SPX

Software and Comm. Equip is trading at 33% and 2% above their historical medians. S&P 500 and S5INFT are at 17% and 15% above their historical medians respectively.

# Price to Cash Flow



P/CF	S5COMM	S5ELEIX	S5ITSV	S5INSSX	S5SSEQ
<b>Mean</b>	14.54	17.30	16.00	25.47	15.96
<b>Median</b>	14.23	16.35	16.52	24.44	14.85
<b>Max</b>	20.30	31.77	19.89	40.01	29.61
<b>Min</b>	10.49	8.76	11.30	14.65	10.33
<b>Current</b>	13.07	21.69	17.69	26.35	20.09

P/CF	S5SOFT	S5CMPE	S5INFT	SPX
<b>Mean</b>	13.88	10.92	14.34	14.64
<b>Median</b>	13.52	10.71	14.63	14.33
<b>Max</b>	19.80	14.27	17.94	20.73
<b>Min</b>	9.46	7.95	10.27	8.93
<b>Current</b>	18.63	11.64	17.57	20.34

Industry	Color	Ticker
Communications Equip.	Purple	S5COMM
Elec. Equip., Instr. & Comp.	Orange	S5ELEIX
IT Services	Red	S5ITSV
Internet Software & Services	Light Blue	S5INSSX
Semicond. & Semicond. Equip.	Pink	S5SSEQ
Software	White	S5SOFT
Tech. HW, Storage & Peripherals	Dark Blue	S5CMPE
IT Sector	Yellow	S5INFT
S&P 500	Green	SPX

Software and Comm. Equip is trading at 38% above and 8% below their historical medians. S&P 500 and S5INFT are at 42% and 20% above their historical medians respectively.

Note: the statistics is calculated from 2009 onward.

# Relative Valuations



P/E	S5COMM	S5ELEIX	S5ITSV	S5INSSX	S5SSEQ	S5SOFT	S5CMPE	S5INFT	P/S	S5COMM	S5ELEIX	S5ITSV	S5INSSX	S5SSEQ	S5SOFT	S5CMPE	S5INFT
Mean	1.16	0.96	1.08	1.73	1.21	1.11	0.88	1.08	Mean	2.04	1.10	1.55	4.28	1.92	2.87	1.20	1.80
Median	1.01	0.98	1.05	1.51	1.07	1.05	0.85	1.08	Median	2.11	1.12	1.60	4.00	1.98	2.88	1.20	1.75
Max	1.95	1.03	1.22	2.06	3.00	1.24	0.98	1.08	Max	2.07	1.47	1.66	5.46	1.99	3.09	1.36	1.87
Min	1.01	0.55	1.02	1.38	0.87	0.99	0.83	0.97	Min	2.44	0.66	1.63	4.48	2.15	3.29	1.24	1.90
Current	0.79	0.98	1.05	1.69	1.08	1.52	0.66	1.08	Current	1.52	1.32	1.69	4.02	1.96	2.89	1.04	1.90
P/B	S5COMM	S5ELEIX	S5ITSV	S5INSSX	S5SSEQ	S5SOFT	S5CMPE	S5INFT	P/CF	S5COMM	S5ELEIX	S5ITSV	S5INSSX	S5SSEQ	S5SOFT	S5CMPE	S5INFT
Mean	1.19	0.80	2.09	1.60	1.19	1.86	1.62	1.53	Mean	0.99	1.18	1.09	1.74	1.09	0.95	0.75	0.98
Median	1.13	0.85	2.33	1.47	1.21	1.81	1.59	1.54	Median	0.99	1.14	1.15	1.71	1.04	0.94	0.75	1.02
Max	1.57	0.84	2.41	2.36	1.27	2.32	2.00	1.70	Max	0.98	1.53	0.96	1.93	1.43	0.95	0.69	0.87
Min	1.23	0.59	1.72	1.48	1.13	1.93	1.56	1.52	Min	1.17	0.98	1.26	1.64	1.16	1.06	0.89	1.15
Current	1.00	0.87	2.31	1.52	1.21	2.10	1.45	1.57	Current	0.64	1.07	0.87	1.30	0.99	0.92	0.57	0.86

Comm. Equip appears to be the cheapest industry within the IT sector currently. With P/E, P/S, P/B, and P/CF all trading at 21%, 28%, 11%, and 35% below their historical means. Tech. HW, Storage & Peripherals appears to be the next cheapest industry.

Overall, the IT Sector is observed to be overpriced looking at P/S (at a 9% premium) while underpriced looking at P/CF (at a 15% discount).





# Recommendation

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Recommendation





## Positives:

- IT Sector has historically enjoyed a higher operating margins and profit margins than those of the aggregate S&P 500
- Information Technology is an integral part of the economy and it helps drive growth and productivity of all industries
- InfoTech has an attractive valuation with P/CF at 15% discount from historical median

## Risks:

- Valuation is slightly expensive in the certain industries (i.e. Software) within the sector and also more volatile
- The sector tends to have a short life cycle due to innovation and competition



**High operating and profit margins**



**Integrated part of the Economy**



**Low P/CF**



Recommendation

**Overweight**



**THE OHIO STATE UNIVERSITY**

FISHER COLLEGE OF BUSINESS

**End of Presentation**

**Thank You For Listening**

# References

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## Slide 5: Snapshot

[http://research2.fidelity.com/fidelity/research/reports/public/getReport.asp?feedID=2271&docTag=Q42016SectorUpdate\\_63\\_20161013&versionTag=201601013172151816](http://research2.fidelity.com/fidelity/research/reports/public/getReport.asp?feedID=2271&docTag=Q42016SectorUpdate_63_20161013&versionTag=201601013172151816)

[https://eresearch.fidelity.com/eresearch/markets\\_sectors/sectors/sectors\\_in\\_market.jhtml?tab=industries&sector=45](https://eresearch.fidelity.com/eresearch/markets_sectors/sectors/sectors_in_market.jhtml?tab=industries&sector=45)

<https://institutional.fidelity.com/app/proxy/content?literatureURL=/953053.PDF>

## Slide 7: Demand

<https://www.fidelity.com/viewpoints/investing-ideas/2016-outlook-information-technology>

All other data is obtained from Bloomberg