25 February 2019
Update | Sector: Technology

Infosys

BSE SENSEX	S&P CNX
36,213	10,880

Bloomberg	INFO IN
Equity Shares (m)	4,571
M.Cap.(INRb)/(USDb)	3297.9 / 46.4
52-Week Range (INR)	771 / 542
1, 6, 12 Rel. Per (%)	3/13/25
Avg Val, INRm	5893
Free float (%)	87.2

Financials & Valuations (INR b)

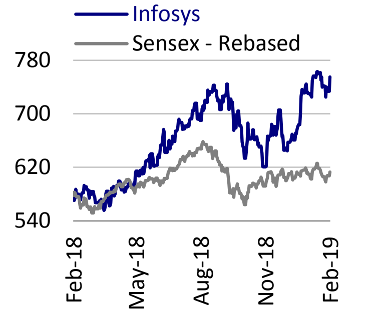
Y/E Mar	2019E	2020E	2021E
Net Sales	828.6	926.9	1,025.7
EBITDA	211.4	228.7	257.6
PAT	162.5	170.0	197.9
EPS (INR)	36.4	39.2	45.6
Gr. (%)	12.4	7.7	16.4
BV/Sh (INR)	142.6	143.5	166.7
RoE (%)	25.6	27.4	29.4
RoCE (%)	25.6	27.4	29.4
P/E (x)	20.2	18.8	16.1
P/BV (x)	5.2	5.1	4.4

Shareholding pattern (%)

As On	Dec-18	Sep-18	Dec-17
Promoter	12.8	12.8	12.9
DII	22.6	22.2	21.7
FII	34.9	35.5	35.4
Others	29.7	29.5	30.0

FII Includes depository receipts

Stock Performance (1-year)



CMP: INR755 TP: INR865(+15%) Buy

Stark similarities witnessed in brief period of two leaders…

…and its implications for valuations amid FY20 margin pressure

Concerns around FY20 margins — perhaps, a familiar territory?

- Even as INFO's revenue growth improves — its FY19 EBIT margin exit at ~22-22.5% followed by wage hikes in 1QFY20, pose a risk to consensus EBIT estimate of 23.4% for FY20. This is a key concern weighing on the stock's attractiveness.
- INFO's recent revival under Mr. Salil Parekh in revenue growth (from 4.6% constant currency (CC) in 2QFY18 to 10.1% CC in 3QFY19) came with an EBIT margin decline of 120bp, despite the INR/USD depreciating 11% during the same period.
- The trend is remarkably similar to the period under Dr. Vishal Sikka, when INFO's revenues increased from 6.3% CC in 2QFY15 to 15% YoY CC in 4QFY16 and 12% in 1QFY17. EBIT margin during this period shrank 200bp and currency had depreciated by 11%.

Valuations have laid emphasis on revenue growth

- In both instances, however, we see revenue growth gaining priority over margins. In the earlier period, INFO saw its stock price gain 33%, while in the recent period, the uptick in the stock price was a robust 59%.

No decline in pricing, but elevated cost of delivery

- A big difference between the two periods under different leaders is the realization rate. There was a significant drop of ~7.7% during the earlier period under Dr. Vishal Sikka, in the CC offshore realization.
- However, the same has remained within a tight range in the last seven quarters under Mr. Salil Parekh, and yet the similarity of margin performance. Margins were impacted at the gross level in both instances and sub-contracted costs also expanded almost equally on both occasions.
- A potential explanation is the elevated delivery costs this time around, for sustained price points. The employee cost as a % of revenue in recent quarters is only marginally better than that in the period of declining realization rates.

A different era for margin-revenue correlation, at least in the near term

- Traditionally, revenue growth has been a key lever for margin expansion in the industry. This was due to disproportionately higher fresher additions to fuel growth, which brought down the overall cost of delivery.
- In the recent past, onsite centricity, healthy lateral mix, and greater use of sub-contractors are all accompaniments of growth, defying revenue growth as a lever for profitability. But sustained demand should allow the industry to either (1) pass on the higher cost to clients, or (2) eventually reap the fruits of investing in onsite talent development.
- We estimate margin pressure for INFO to bottom out in FY20 between 22.5-23%. Our price target of INR865 discounts forward earnings by 19x, a 10% discount to TCS' 1-year forward multiple. Maintain **Buy**.

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Valuation direction - FY20 revenue acceleration v/s profitability pressure

- As INFO's revenue growth inched up under its new leadership — from 4.6% YoY CC in 2QFY18 to 10.1% YoY CC in 3QFY19 (and expected to improve further) – some concerns have emerged around margins. While INFO's EBIT margin declined 180bp during 2QFY18 - 3QFY19, notably, the INR depreciated 11% v/s the USD during the same period.
- The decline in EBIT margin naturally raises concerns over the lack of profitable revenue growth. In CC terms, INFO's quarterly revenue Increased 11% during 2QFY18 - 3QFY19, while EBIT (USD) was up only 4% during this period.
- On the base of 3QFY19 and adjusted EBIT margin of 23%, INFO cited that 4Q margins should decline further QoQ, amid the back-ended nature of investments towards localization. An exit at ~22.5% would peg the full-year EBIT margin at 23.3%. 1QFY20 will see an impact from majority of the wage hikes, most likely pulling the margin to or below 22%, thereby challenging the flat margin of 23.3% for FY20, which is current consensus expectation.
- Trajectory for FY20 margin may continue treading on a similar path — a key, potential concern while considering INFO's investment attractiveness.

Exhibit 1: Impressive revenue growth improvement…

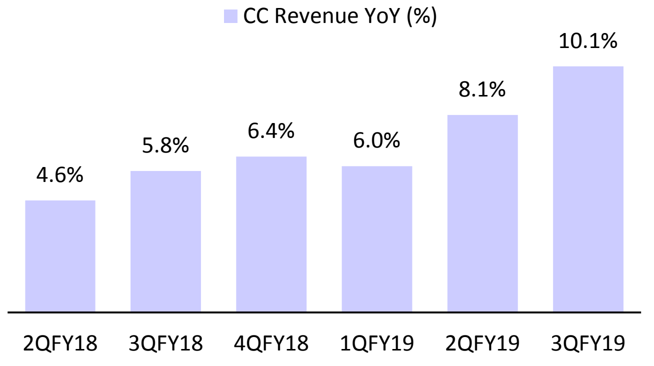


Exhibit 2: …with the depreciation of the INR…

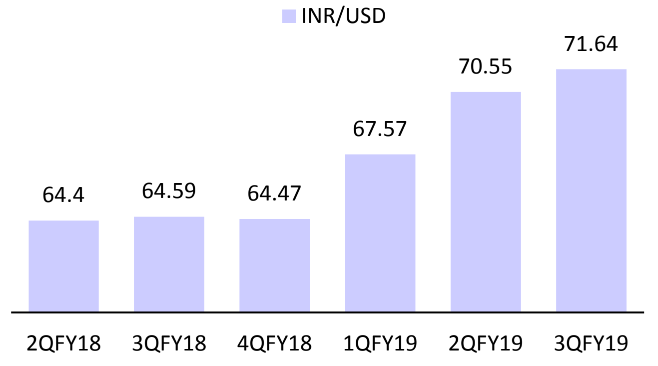
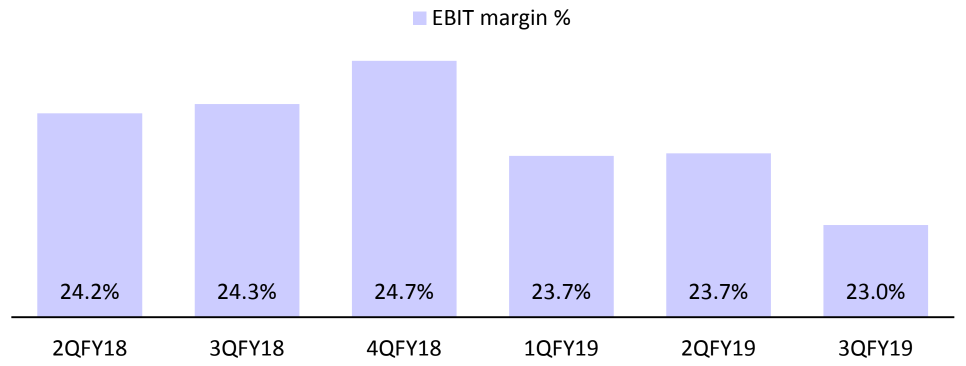


Exhibit 3: …yet EBIT margin declined



Source: MOSL, Company

Not new, and precedence is not too old...

There is an answer to the valuation conundrum, if INFO's not-so-distant past is anything to go by. Under the leadership of Dr. Vishal Sikka, we saw a very similar trend during 2QFY15 - 1QFY17.

- Revenue growth accelerated from 6.3% YoY CC to 15% YoY CC in 4QFY16 and 12% YoY CC in 1QFY17
- The INR depreciated 11% v/s the USD, EBIT margin declined 200bp from 26.1% to 24.1% during the same period.

Exhibit 4: Impressive acceleration in revenues...

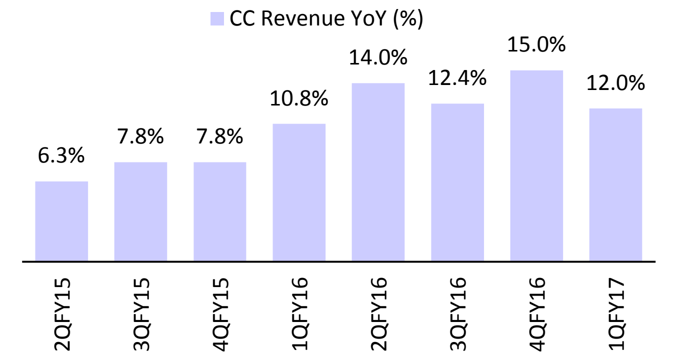


Exhibit 5: ...coupled with INR depreciation...

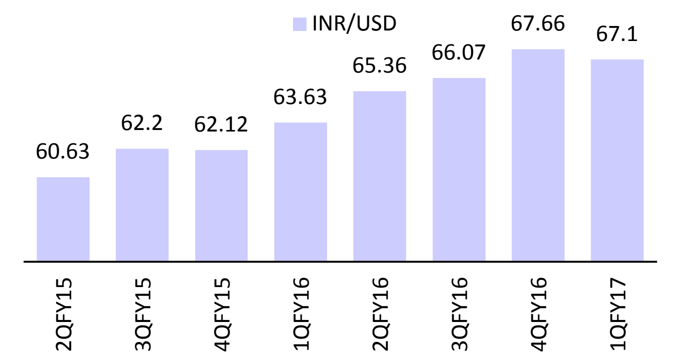
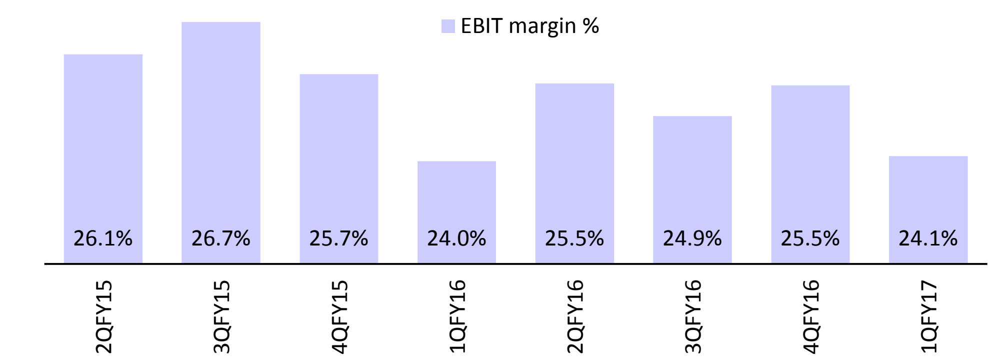


Exhibit 6: ...but a familiar decline in margins



Source: MOSL, Company

... Valuations reacted very similarly in both instances

- In both instances, we saw an uptick in revenue growth gaining precedence over the corresponding compromise on the margins front. Between 2QFY15 (Jul'14) and post 1QFY17 (Jul'16 – after the announcement of 1QFY17 performance), INFO's stock price appreciated by 33%.
- Similarly, between Jul'17 and Jan'19 (post 3QFY19 results), INFO's stock price appreciated by an even higher number - 59%.
- Even the PE ratio expanded on both the occasions, validating that the uptick in valuations were not merely led by earnings uptick from depreciating INR.

Exhibit 7: Valuations benefited from revenue growth…

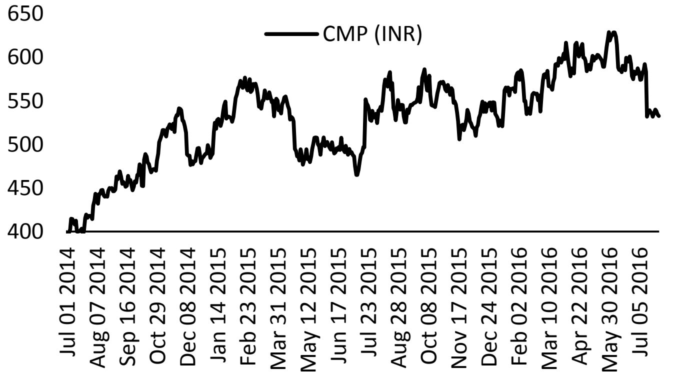


Exhibit 8: … on both the occasions

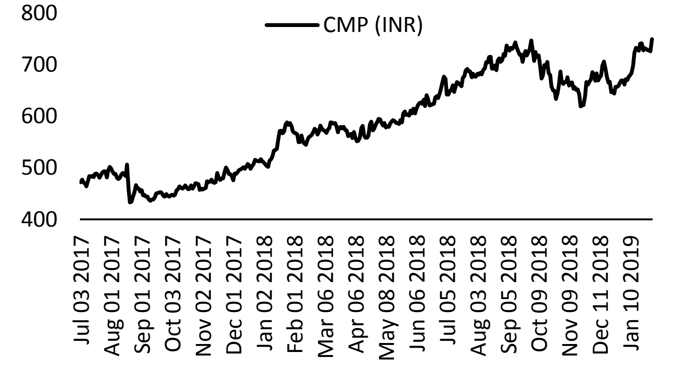


Exhibit 9: P/E multiple expanded on both occasions, a dip in the previous period was due to internal instability…

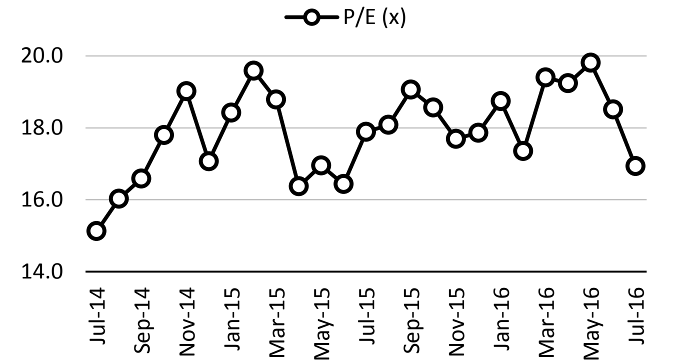
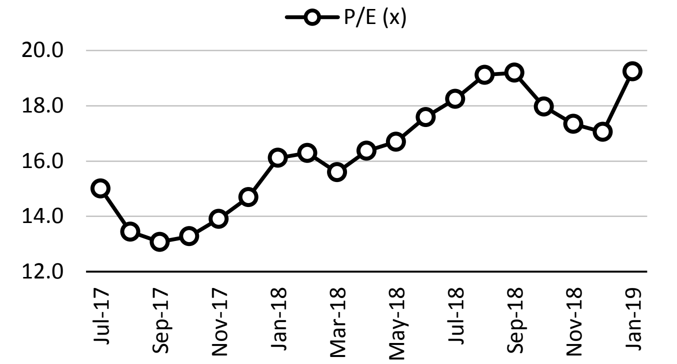


Exhibit 10: …multiple expansion pronounced recently amid relative stability



But with one key difference

- We note — a key difference in margin performance in the previous period v/s the current one is pricing. INFO resorted to an aggressive stance under the previous leadership in order to win large deals, often citing that pricing pressure in commoditized services is a reality.
- This was reflected in offshore CC productivity trend, which, when indexed at 100, was down to 92.3 by 1QFY17, implying 7.7% CC decline in pricing over the period. That was not the case this time around. On the contrary, pricing/ realization situation has been far more stable over 2QFY18-3QFY19 (exhibit 11 and 12 – realization indexed at 100 with 1QFY15 as the base).

Exhibit 11: Realization rates had declined under Dr. Sikka…

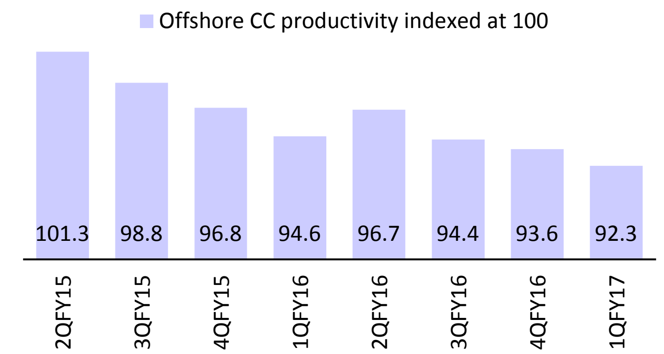
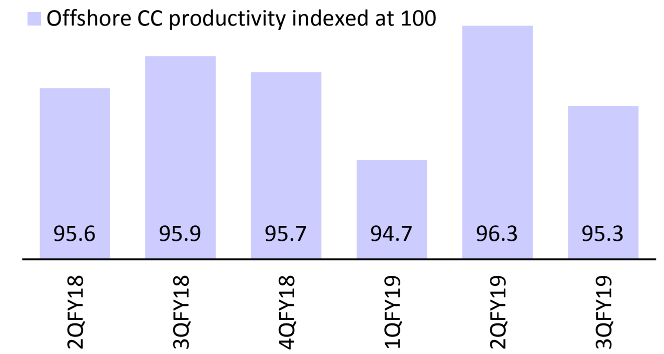


Exhibit 12: … contrary to the trend under the new leader



So are factors behind the margin decline different?

- In both the previous and the current instances, almost the entire decline was witnessed in gross margins. The key factor in the margin performance over 2QFY15-1QFY17 can be explained by pricing. However, that was not the case over 2QFY18-3QFY19.
- Sub-contractors evidently grew during this period, however, that was no different over 2QFY15-1QFY17 either, as seen below:

Exhibit 13: Sub-contracting costs have been inching up…

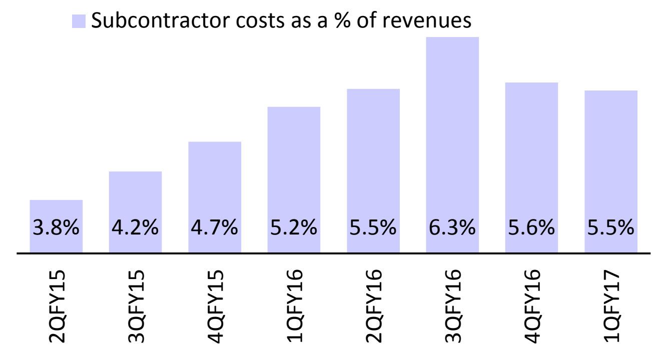
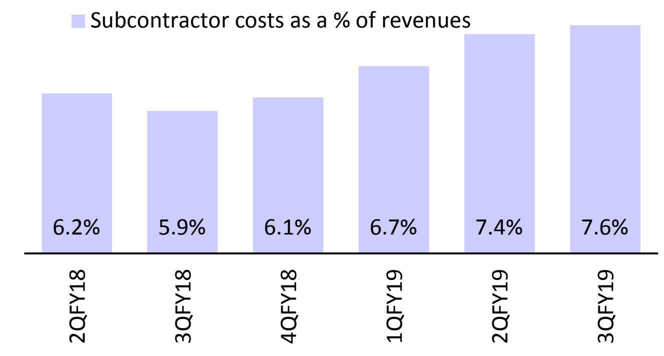


Exhibit 14: …in both the periods



Not pricing, but 'value/contribution margin' pressure?

- When we look at INFO's employee costs as a % of revenues (full-time employees), it is similar, or at best only marginally better in the second period, which is surprising considering the differential trend in pricing.
- What potentially explains the trend is delivery at 'discounted value or contribution margin' in the most recent period, if not the discounted price. In other words, while realization rates remain intact, the cost of delivering projects in the Digital era are on the rise, much of which may not have been passed on to the customers.

Exhibit 15: Stable employee costs as a % of revenues …

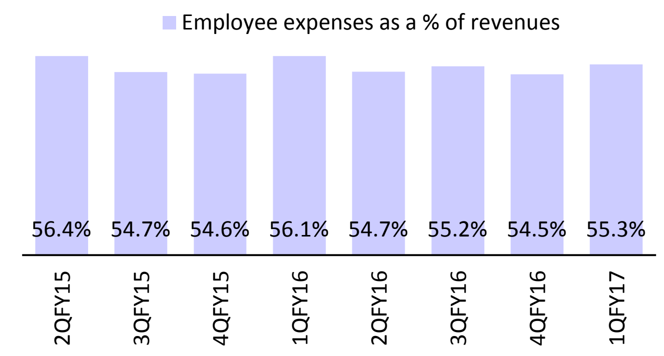
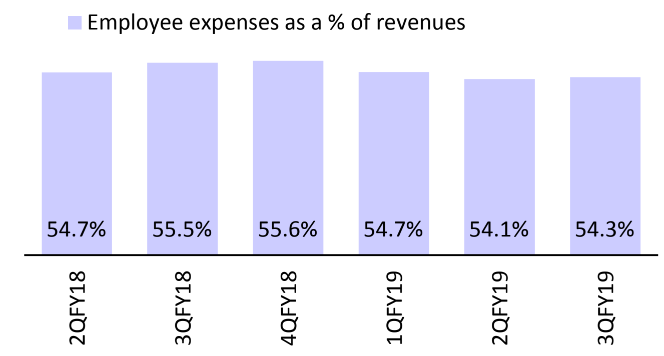


Exhibit 16: … only marginally better in recent period



Whatever happened to revenue growth = margins!

- Revenue growth has traditionally been a key lever for margins, the biggest reason being the linearity of growth. While headcount additions typically mirrored revenue addition, incremental headcount proportion would skew predominantly towards freshers, thereby bringing the average cost of delivery down. Below exhibit is an elaboration of the same:

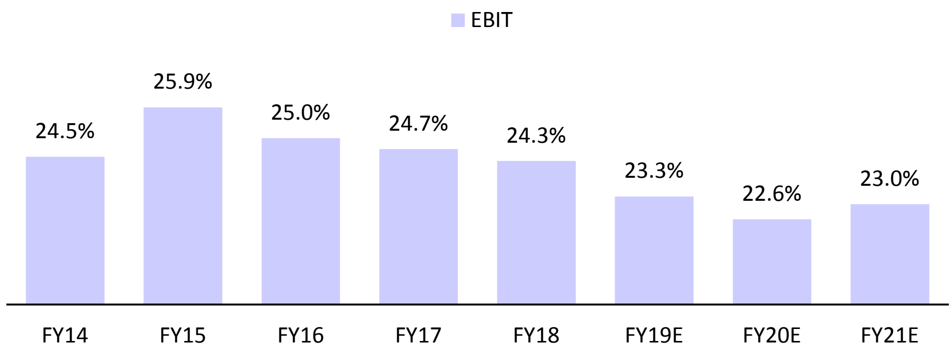
- If the proportion of freshers was 50% in the existing employee base and headcount (and revenue) growth was 20%, with 60% incremental additions as freshers, it would take the overall fresher mix to 52%.
- In the case of 15% growth with 60% of headcount addition as freshers, the fresher mix will settle at 51%. Thus, (1) the average cost per employee should decline in both the instances, and (2) the average cost per employee should decline more for higher revenue growth.

Simulation		20% growth scenario		15% growth scenario	
Rev. growth = headcount growth	**Current**	**Growth**	**Total**	**Growth**	**Total**
Total employees	100	20	120	15	115
Fresher %	**50%**	60%	**52%**	60%	**51%**
Laterals %	50%	40%	48%	40%	49%
Freshers	50	12	62	9	59
Laterals	50	8	58	6	56

Sustained growth should help margins; expect INFO to improve beyond FY20

- There is a risk to FY20 consensus margins going by the guidance for 4Q and the cyclicality of wage hikes heading into FY21. This pressure on margins is comparable to the previous period in FY15-17, and revenue growth has had precedence over margins for the stock price.
- Despite the potential decline in margins, its revenue growth may continue to dominate valuations, given that there is room for valuation multiples to expand further, when compared with the likes of TCS.
- Onsite centricity, less number of freshers, and higher sub-contractors all imply higher cost of deliveries, defying revenue growth as a lever for profitability. But with demand remaining robust, (1) industry should either be able to pass on the higher cost to clients, or (2) start reaping the fruits by investing in onsite talent, thereby bringing down the cost of delivery. Either ways, the impact of revenue growth on margins should be positive over the medium-to-long term, rather than a neutral one, in our view.
- Risk to our thesis is the dominance of lower value-add work in Digitial, which could inherently be lower margin, dragging the profitability for longer than we anticipate. For now, we estimate margin pressure for INFO to bottom out in FY20 between 22.5-23%.

Exhibit 17: Expect pressure on margins to bottom in FY20E



Source: MOSL, Company

Investment thesis

A foreword on the long-term industry view: Growth for Indian IT should gradually pick up from the current 6-7% as Digital Services proliferate, which currently is still small to move the needle in the overall performance. India will continue to remain the hotbed for talent supply en masse, making a case for the increasing shift of the Digital business from onsite to offsite. That said, with Automation as the top priority of every Board, without exception, delineation of revenue growth with headcount growth appears obvious; and the only lever to stem the decline in profitability witnessed in recent years.

INFO in the industry backdrop

- **Inward focus meant some catch-up play:** INFO has built capabilities to match spend-shifts in the past three years. Its portfolio is not very different from the industry, but it has been investing in new services and solutions. Digital now contributes over 30% to the overall revenue for the company. Execution rigor has been mantra for the company under the new management. Its inward focus, following recent distractions, mean it will be left playing catch-up to the more focused players in the market over the next year or so.
- **Operational efficiency being put to test:** On the profitability front, it had been following a rigorous discipline over the last couple of years. This has helped to hold margins in a tight band while investing aggressively in building capabilities, and going through a price reset in competitive traditionally large deals. Going forward, investments in building capabilities, localization and boosting the sales function have been in focus, which should keep margins under some pressure in the foreseeable future.

Therefore, we expect INFO to grow revenues in line with the industry, on benefits from its initiatives in sales expansion and localization. But, we expect margins to reset at lower levels, which will be a function of elevated costs due to conducting business onsite. As a result, we are factoring in 10%/11% CAGR in CC revenue/earnings over FY18-21E.

Valuation and view

- **It's all about revenue growth**: Valuation multiples have historically ascribed to the highest valuation to revenue growth, which is not surprising as it is also the single largest lever for margins. As growth at INFO declined from 20%+ to single-digits, the current forward P/E multiple is at 16.5x compared to the long-term average of 18x.
- **Longevity may be the offsetting play**: As the industry shifts its gears to Digital, there remains a tremendous need to up investments in technology across the board. Companies partaking in this wave may not materially outgrow their peers, but will still enjoy significantly higher multiples for the other key determinant of valuation – longevity. Digital-ready vendors offer healthier visibility of profits and cash flow generation currently, while legacy businesses are faced with the dual pressure of shrinking revenue pie.

- **Case for re-rating supported by examples of Accenture and CTSH:** The test for Indian IT is sterner than ever before, and we see growth from newer technologies as a strong case in point for accretion of valuation multiples, even without the acceleration in revenues. CTSH, which is growing lower than its enamored history, and Accenture, are case in points, which drive our thesis.
- **Valuation catch-up progressing on expected lines**: On the back of a robust show in revenue growth, deal wins and upgraded guidance, we had increased our FY19/20/21 revenue estimates by 0.6%/1.1%/2.0%. However, given the cost challenges, we trimmed our EBIT margin estimates for FY19/20/21 by 42bp/62bp/44bp. INFO's performance under new leadership will make a case for narrowing of the valuation gap to leading peers such as TCS, in line with our thesis. Our price target of INR865 discounts forward earnings by 19x, a 10% discount to TCS' 1-year forward multiple. Maintain **Buy**

Key triggers

- Pick-up in growth led by strength seen in multiple areas
- Turnaround in direction of profitability
- Stemming of attrition to historical norms

Key risk factors

- Adverse regulatory developments around current visa regime
- Additional instability in leadership and execution from multiple exits
- Issues in certain pockets weighing on overall growth

Exhibit 18: INFO 1 year forward P/E chart

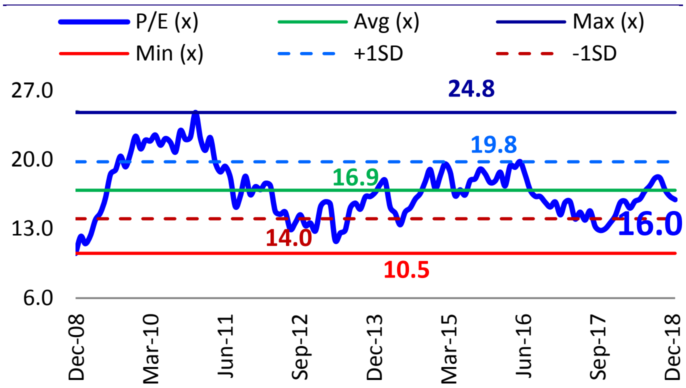


Exhibit 19: INFO 1-year forward P/B chart

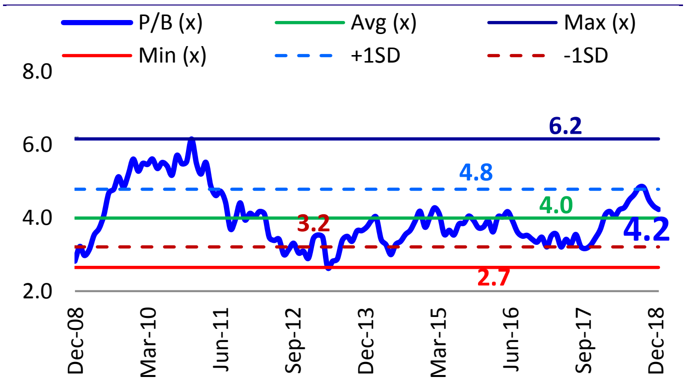


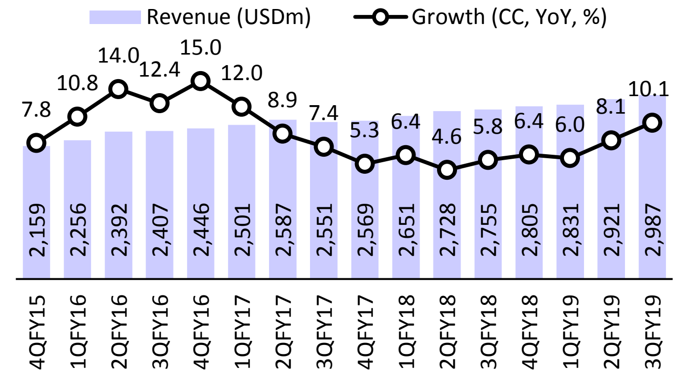
Exhibit 20: Operating metrics

	2QFY17	3QFY17	4QFY17	1QFY18	2QFY18	3QFY18	4QFY18	1QFY19	2QFY19	3QFY19
Verticals (%)										
Financial Services				32.9	33.1	32.1	32.5	31.7	32.2	**32.5**
Retail				16.2	15.9	16.2	15.9	16.5	16.8	**16.4**
Communications				12.5	12.4	12.4	12.9	12.7	12.3	**11.9**
Energy, Utilities, Resources				11.3	11.7	12.0	12.0	12.4	12.3	**12.8**
Manufacturing				9.3	9.3	9.5	9.5	9.6	9.6	**10.1**
Hi Tech				7.3	7.2	7.1	7.3	7.4	7.5	**7.3**
Life Sciences				6.5	6.7	6.5	6.7	6.5	6.4	**6.2**
Others				3.6	3.4	3.2	2.9	2.9	2.9	**2.8**
Service Lines (%)				94.6	94.8	94.6	95.1	95.2	94.9	**94.5**
Digital				22.4	23.6	24.2	25.3	26.7	28.9	**29.3**
Core				72.2	71.2	70.4	69.8	68.5	66.0	**65.2**
Products & Platforms (%)				5.4	5.2	5.4	4.9	4.8	5.1	**5.5**
Digital				1.5	1.6	1.9	1.5	1.7	2.1	**2.2**
Core				3.9	3.6	3.5	3.4	3.1	3.0	**3.3**
Geography (%)										
North America	61.5	62.0	62.3	61.1	60.6	60.4	59.4	60	60.3	**60.4**
Europe	22.5	22.2	22.1	22.4	23.2	24.4	24.8	24.3	24.0	**24.2**
India	3.4	3.4	3.2	3.6	3.3	3.0	2.8	2.6	2.5	**2.6**
RoW	12.6	12.4	12.4	12.9	12.9	12.2	13.0	13.0	13.2	**12.8**
Clients (%)										
Revenues from top client	3.5	3.1	3.3	3.3	3.4	3.4	3.6	3.7	3.9	3.4
Revenues from top 5 clients	13.1	12.3	12.2	Nm	Nm	Nm	Nm	Nm	Nm	Nm
Revenues from top 10 clients	21.8	20.1	20.2	20.0	19.5	19.2	19.5	19.2	19.4	19.2
Revenues from 2-5 client	9.6	9.2	8.9	Nm	Nm	Nm	Nm	Nm	Nm	Nm
Revenues from 6-10 clients	8.7	7.8	8.0	Nm	Nm	Nm	Nm	Nm	Nm	Nm
Revenues from Non-Top 10 clients	78.2	79.9	79.8	80.0	80.5	80.8	80.5	80.8	80.6	80.8
Clients added during the quarter	**78**	**77**	**71**	**59**	**72**	**79**	**73**	**70**	**73**	**101**
Total active client	**1136**	**1152**	**1162**	**1164**	**1173**	**1191**	**1204**	**1214**	**1222**	**1251**

Source: MOSL, Company

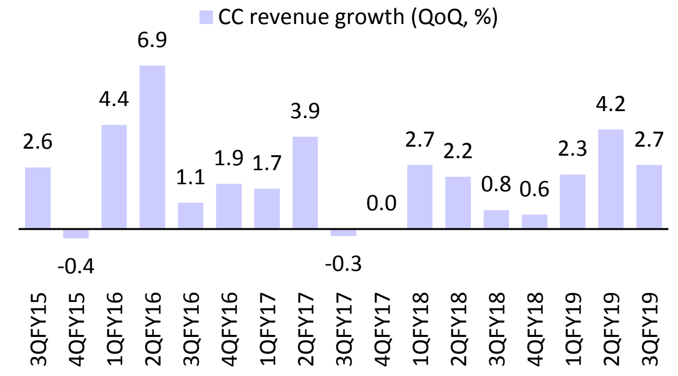
Story in charts

Exhibit 21: Gradually getting past growth issues…



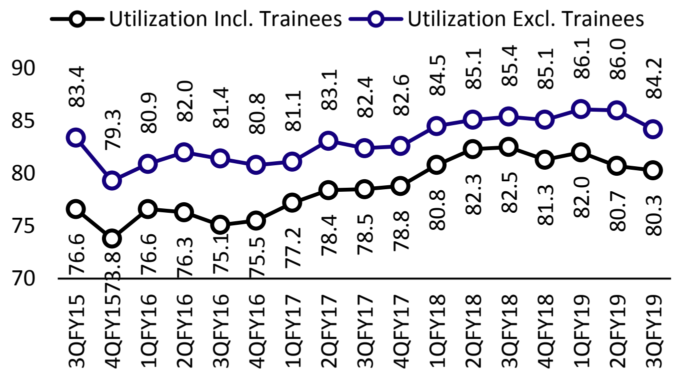
Source: Company, MOSL

Exhibit 22: …resulting in expectations of improved performance going forward



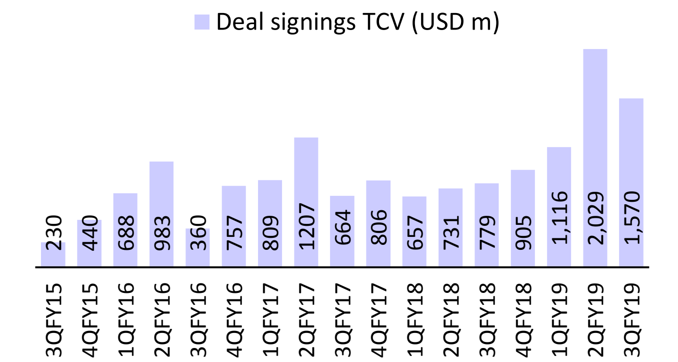
Source: Company, MOSL

Exhibit 23: Utilization cooling off from record highs



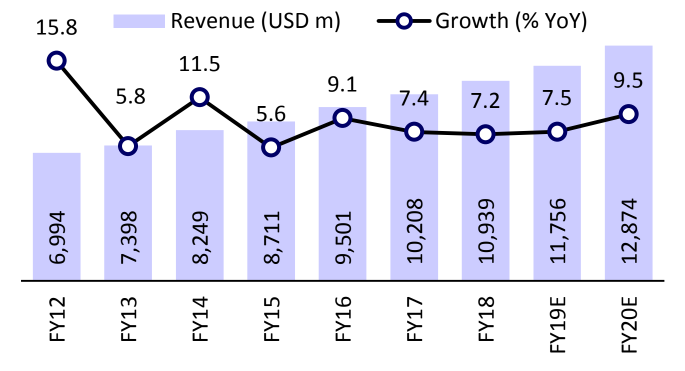
Source: Company, MOSL

Exhibit 24: Deal signings sustaining above benchmark (USD1b)



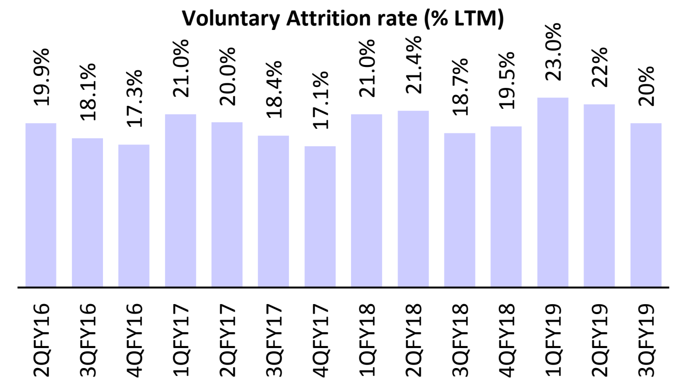
Source: Company, MOSL

Exhibit 25: Gap with industry growth has reduced…



Source: Company, MOSL

Exhibit 26: … more work to be done on containing attrition



Source: Company, MOSL

Financials and Valuations

Income Statement						(INR m)
Y/E March	**2016**	**2017**	**2018**	**2019E**	**2020E**	**2021E**
Sales	**624,410**	**684,850**	**705,220**	**828,570**	**926,947**	**1,025,667**
Change (%)	17.1	9.7	3.0	17.5	11.9	10.6
Software Develop. Exp.	376,390	415,500	432,690	517,465	589,272	649,018
Selling and Mktg. Exp.	34,310	35,910	35,580	44,219	48,656	53,335
Administration Exp.	42,920	47,390	46,850	55,459	60,324	65,703
EBITDA	**170,790**	**186,050**	**190,100**	**211,428**	**228,696**	**257,611**
% of Net Sales	27.4	27.2	27.0	25.5	24.7	25.1
Depreciation	14,590	17,030	18,580	18,746	19,515	19,773
Other Income	31,250	30,790	31,930	29,261	23,740	31,420
PBT	**187,450**	**199,810**	**203,450**	**221,942**	**232,921**	**269,258**
Tax	52,520	55,980	42,420	59,456	62,889	71,353
Rate (%)	28.0	28.0	20.9	26.8	27.0	26.5
Minority Interest	0	0	0	0	0	0
Adjusted PAT	**134,930**	**143,830**	**161,030**	**162,486**	**170,033**	**197,905**
Extraordinary Items	0	0	14,320	-1,091	0	0
Reported PAT	**134,930**	**143,830**	**146,710**	**163,578**	**170,033**	**197,905**
Change (%)	9.4	6.6	2.0	11.5	3.9	16.4

Balance Sheet						(INR m)
Y/E March	**2016**	**2017**	**2018**	**2019E**	**2020E**	**2021E**
Share Capital	22,880	22,880	21,760	21,711	21,711	21,711
Reserves	594,910	666,550	627,470	597,452	601,382	702,016
Net Worth	**617,790**	**689,430**	**649,230**	**619,163**	**623,092**	**723,727**
Capital Employed	**617,790**	**689,430**	**649,230**	**619,163**	**623,092**	**723,727**
Gross Block	208,370	227,210	247,620	266,900	294,900	322,900
Less : Depreciation	74,510	85,810	102,820	121,566	141,081	160,854
Net Block	**133,860**	**141,400**	**144,800**	**145,334**	**153,819**	**162,046**
CWIP	18,930	19,650	21,320	20,441	20,441	20,441
Investments	21,050	167,070	121,790	157,720	197,720	237,720
Curr. Assets	**580,050**	**505,040**	**510,500**	**483,414**	**459,006**	**526,857**
Debtors	143,590	159,700	174,030	205,626	230,040	254,539
Cash & Bank Balance	326,970	226,250	198,710	166,542	117,091	144,341
Loans & Advances	104,130	113,690	124,940	99,066	99,695	115,796
Other Current Assets	5,360	5,400	12,820	12,180	12,180	12,180
Current Liab. & Prov	**136,100**	**143,730**	**149,180**	**187,746**	**207,895**	**223,337**
Current Liabilities	79,760	83,640	101,490	114,973	130,085	143,090
Provisions	56,340	60,090	47,690	72,773	77,809	80,247
Net Current Assets	**443,950**	**361,310**	**361,320**	**295,668**	**251,112**	**303,520**
Application of Funds	**617,790**	**689,430**	**649,230**	**619,163**	**623,092**	**723,727**

E: MOSL Estimates

Financials and Valuations

Ratios

Y/E March	2016	2017	2018	2019E	2020E	2021E
Basic (INR)						
EPS	**29.5**	**31.4**	**32.4**	**36.4**	**39.2**	**45.6**
Cash EPS	32.7	35.2	39.6	41.7	43.7	50.1
Book Value	135.1	150.8	143.3	142.6	143.5	166.7
DPS	12.4	12.9	16.2	22.0	19.0	19.0
Payout % (excl.div.tax, inc. buyback)	41.9	40.9	126.2	67.2	87.8	40.6
Valuation (x)						
P/E	24.9	23.4	22.7	20.2	18.8	16.1
Cash P/E	22.5	20.9	18.6	17.6	16.9	14.7
EV/EBITDA	17.7	16.0	15.9	13.6	12.6	10.9
EV/Sales	4.8	4.3	4.3	3.5	3.1	2.7
Price/Book Value	5.4	4.9	5.1	5.2	5.1	4.4
Dividend Yield (%)	1.7	1.7	2.2	3.0	2.5	2.5
Profitability Ratios (%)						
RoE	23.2	22.0	24.1	25.6	27.4	29.4
RoCE	23.2	22.0	24.1	25.6	27.4	29.4
Turnover Ratios						
Debtors (Days)	84	85	90	91	91	91
Fixed Asset Turnover (x)	5.3	5.2	5.2	5.9	6.4	6.7

Cash Flow Statement **(INR m)**

Y/E March	2016	2017	2018	2019E	2020E	2021E
CF from Operations	144,970	160,070	146,650	152,612	165,807	186,258
Cash for Working Capital	-22,540	-19,440	-1,060	32,844	-4,894	-25,158
Net Operating CF	**122,430**	**140,630**	**145,590**	**185,456**	**160,913**	**161,099**
Net Purchase of FA	-27,230	-27,600	-19,980	-20,159	-28,000	-28,000
Free Cash Flow	**95,200**	**113,030**	**125,610**	**165,297**	**132,913**	**133,099**
Net Purchase of Invest.	-3,930	-143,140	51,090	-35,930	-40,000	-40,000
Net Cash from Invest.	**-31,160**	**-170,740**	**31,110**	**-56,089**	**-68,000**	**-68,000**
Proceeds from Equity	160	-1,220	-129,600	-32,367	23,740	31,420
Others	0	0	0	0	0	0
Dividend Payments	-68,130	-69,390	-74,640	-129,168	-166,103	-97,270
Cash Flow from Fin.	**-67,970**	**-70,610**	**-204,240**	**-161,535**	**-142,363**	**-65,850**
Net Cash Flow	**23,300**	**-100,720**	**-27,540**	**-32,168**	**-49,450**	**27,249**
Opening Cash Bal.	**303,670**	**326,970**	**226,250**	**198,710**	**166,542**	**117,091**
Add: Net Cash	23,300	-100,720	-27,540	-32,168	-49,450	27,249
Closing Cash Bal.	**326,970**	**226,250**	**198,710**	**166,542**	**117,091**	**144,341**

E: MOSL Estimates

Explanation of Investment Rating	
Investment Rating	**Expected return (over 12-month)**
BUY	>=15%
SELL	< - 10%
NEUTRAL	< - 10 % to 15%
UNDER REVIEW	Rating may undergo a change
NOT RATED	We have forward looking estimates for the stock but we refrain from assigning recommendation

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