JM FINANCIAL

Electronic Manufacturing Services

Empowering local value addition

OPPORTUNITIES

Electronic Manufacturing – USD 300bn	Printed Circuit Board Assembly – USD 12bn	Indian Semiconductor – USD 110bn

JM FINANCIAL

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Three reasons why you should read this report:

1. India's appeal to global players: We illustrate why global companies are increasingly considering India as an attractive investment destination, particularly in light of the need to diversify away from China's manufacturing dominance. India's competitive advantage lies in its labour & talent arbitrage, low penetration with larger domestic market and supportive government policy, positioning it as a significant beneficiary of the "China+1" strategy.

2. Building component eco-system: We highlight how government policies in India are geared towards nurturing a robust component eco-system. Initially focusing on low-value addition tasks, India's strategy involves gradual backward integration to enhance local value addition in electronic components (now moving into semiconductor manufacturing).

3. Comprehensive value chain analysis: Our report delves into the EMS value chain, demand trends, key market players, and their financial performance. We also examine domestic industry dynamics that are driving growth in the manufacturing sector. Furthermore, we explore the global semiconductor market and its value chain, with a particular focus on the opportunities for OSAT in India.

Empowering local value addition

India is swiftly emerging as a manufacturing and exporting hub, propelled by advantageous government policies such as Production Linked Incentive (PLI) and Scheme for Promotion of Manufacturing of Electronic Components and Semiconductors (SPECS), cost competitiveness, robust infrastructure, and a skilled labour force. The "China+1" strategy is further catalysing India's manufacturing landscape.

In global EMS industry, India's share is poised to surge from c.2% in FY21 to c.7% by FY27. Indian Printed Circuit Board Assembly (PCBA) market shall see CAGR of c.39% over FY22-26. As of FY23, the Indian PCBA market (ex. mobile phones) was c.INR 800bn, while the revenue of top-5 listed players was only c.INR 58.70bn, which means there is significant opportunity for them to increase their market share.

Until FY23, most complex Printed Circuit Boards (PCB) were manufactured outside India. In FY23, usage of multi-layer PCBs increased to 55%+ in terms of value vs. just 6% in FY19. We expect with imposing of import duties, to boost component manufacturing; India will accelerate the production of multi-layer PCBs (4-8 layers) which will broaden the TAM of EMS players by c.INR 300bn and also increase export opportunities.

India is strategically aiming to ascend the semiconductor value chain by seizing c.INR 1,000bn Indian Outsourced Semiconductor Assembly and Test (OSAT) opportunity. Although this sector typically yields low margins and asset turnover, it shall offer high returns due to the government's incentive of c.75% capital subsidy. With Kaynes, CG Power and SPEL (in listed space) already announced plans for an OSAT, it is anticipated that other players like Syrma and Cyient DLM will also venture into fab packaging within the next 1-2 years.

Kaynes Technology India Ltd – on a journey of value addition

Kaynes has significantly expanded its PCBA business across various high margin sectors, achieving a remarkable Order Book CAGR of 96% from FY20-23 (current order book INR 37.9bn; 2.4x TTM revenue). The company has also prioritized backward integration, including PCB manufacturing and venturing into the semiconductor value chain. Kaynes has announced plans for OSAT, which is expected to augment its TAM by c.INR 1,000bn. Considering these factors, **we initiate coverage with a BUY rating and a target price of INR 3,410 - upside 20% from CMP (EMS: 2,269, P/E 45x + PCB: 277, P/E 30x + OSAT: 865, P/E 35x).**

Syrma SGS Technology Ltd– riding on high growth sectors with leadership in the RFID business and exploring new sectors, OSAT

Syrma SGS has witnessed strong revenue CAGR of 27% over FY19-FY23, mainly led by sectors such as consumer (42%) and automobiles (31%). However mix has impacted the margins in FY24. We expect over next 2-3 year the share moving towards high margin segment like aerospace, defence, healthcare, smart meter, railways etc, will lead to margin improvement of 130bps over FY24 to FY26. Moreover, we foresee Syrma venturing into the OSAT business within the next 1-2 years, tapping into semiconductor value chain. Considering these, **we initiate coverage with a BUY rating and TP of INR 675, valuing at 35x its FY26 EPS.**

Cyient DLM Ltd– continues focus on aerospace and defence, margins to follow in 2HFY25

Cyient DLM operates within complex and highly regulated sectors such as aerospace and defence, positioning itself as a high-value business entity. Despite margins impacted by legacy pricing contracts with a key defence customer, which we anticipate will be revisited in 2HFY25. It boasts top-notch facilities, SMT lines along with high customer concentration. Within the next 1-2 years, we expect it to venture into the OSAT opportunity. Given these factors, **we value Cyient DLM at 45x on FY26 EPS, our TP at INR 925 - upside 10% from CMP, hence initiate with BUY rating.**

Avalon Technologies Ltd– de-risking USA business by exploring domestic opportunities

Avalon, traditionally a major exporter to the USA, is now shifting focus towards domestic growth opportunities. The company has steadily reduced its export exposure to below 55% from 60% in FY23. Its domestic-focused segments, including EV, energy, and railway sectors, offer significant growth potential. Despite its current growth rate in the domestic market trailing the industry average, Avalon is expected to align with industry growth rates by FY25. Furthermore, a revival in the USA business is anticipated from H2FY25. Based on which **we value Avalon at 36x FY26 EPS to arrive at a TP of INR 620 and initiate with BUY rating.**

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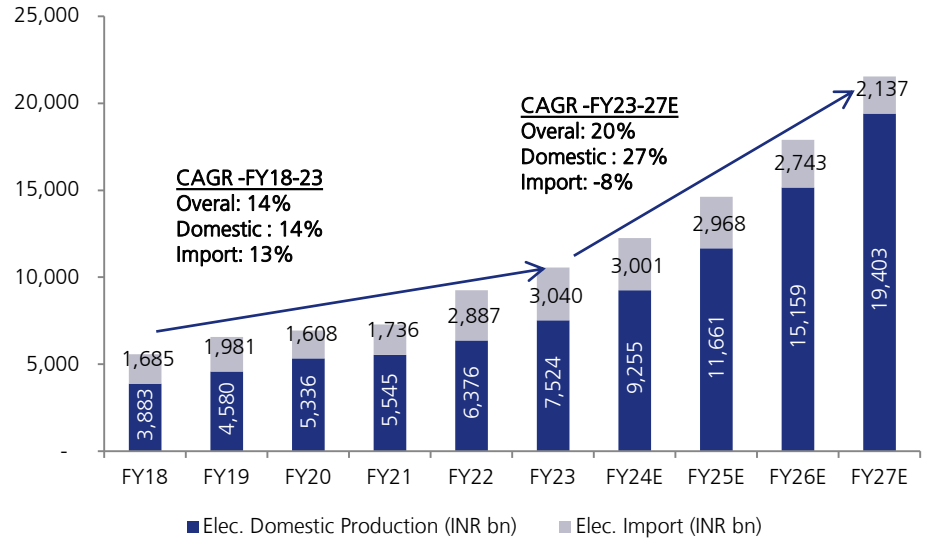
Electronics Manufacturing: Significant potential yet to unfold

India's electronics industry poised to grow at CAGR of c.20%

- India's electronics industry is on the cusp of significant growth in the upcoming years, driven by several key factors. These include: Low Penetration Levels, Rising Disposable Incomes, Improving Power Availability, Increased Localization, Government Policy Initiatives (like M-SIPS, PLI, PMP, and SPECS). The contribution of domestic electronics production to India's GDP is expected to rise significantly, reaching 5.3% by FY27 from 2.8% in FY21, indicating the sector's increasing importance to the overall economy.

India has the potential to be one of the most attractive manufacturing destinations in the world, supporting the objective of "Make in India to Make for the world" – in line with our sector view

Exhibit 1. Total electronic market in India



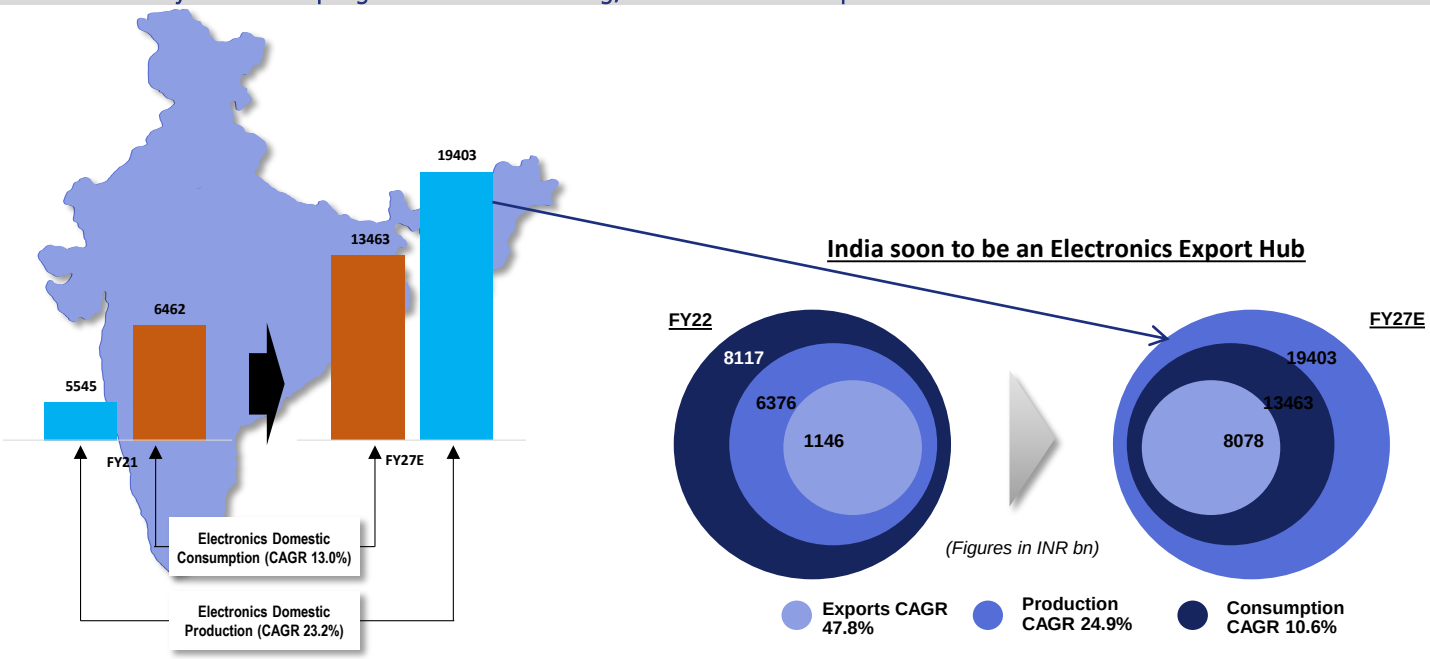
Source: Industry, JM Financial

Domestic production was c.76% of the total market in FY21 and should touch c.90% by FY27.

The total market was INR 10,564bn in FY23 and should touch INR 21,540bn by FY27, at a CAGR of 20%, with C.90% domestic production (Source: Cyient DLM RHP).

We expect the large part of the production is from mobile Phone – INR 2,137bn by FY27.

Exhibit 2. Industry set to see rapid growth in manufacturing, Electronics domestic production to see a CAGR of 23% over FY-21 to FY27E



Source: JM Financial, Industry

Case Study-1: What has India achieved in production over the last 2-3 years in manufacturing?

Over the last 3 years, India has seen very strong production in electronic manufacturing

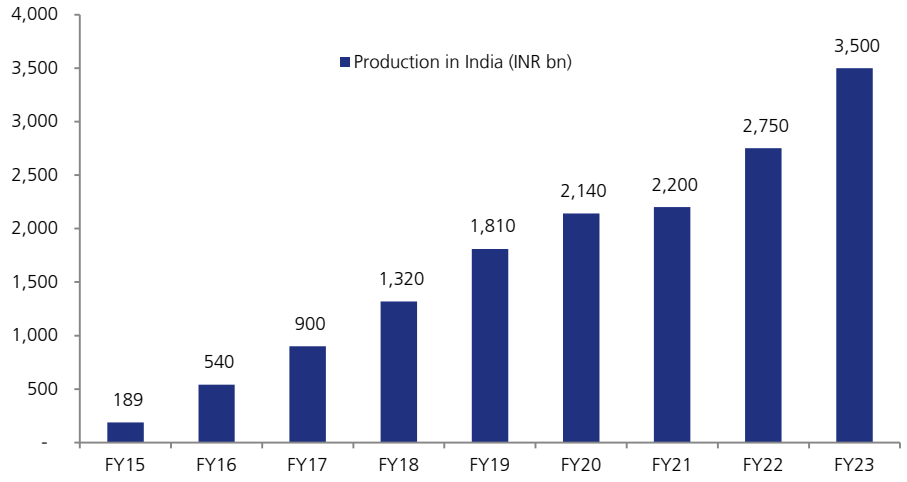
Exhibit 3. Electronics production in India, 2021-23

Item (USD bn)	2020-21	2021-22	2022-2023
Mobile Phones	30	38	44
IT Hardware (Laptops and Tablets)	3	4	4
Consumer Electronics (TV and Audio)	9.5	10	12
Strategic Electronics	4	4.25	4.75
Industrial Electronics	10.5	11	11.75
Wearables and Hearables	0	0.25	1
PCBA	0.5	0.6	1
Auto Electronics	6	7	9.5
LED lighting	2.2	2.5	3
Telecom Equipment	0	0.25	1
Electronics Components	9	9.5	10.75
Total Electronics	**74.7**	**87.35**	**103**

Source: ICEA, JM Financial

The mobile phone manufacturing industry has delivered a **stellar performance since 2015. Manufacturing value has grown 14.6 times in USD terms in 7 years, from INR 189bn (USD 3bn) in 2014-15 to INR 3,500 bn (USD 44bn) in 2022-23.** From a situation where 80% of the domestic demand was supplied by CBU imports, India has come a long way as exports of mobile phones have hit INR 900bn (USD 11.1bn) in 2022-23, which is evident from the exports trend – Exhibit 8.

Exhibit 4. Mobile phone production has seen a CAGR of 31% over FY-16 to FY23.



Source: JM Financial, Industry

Electronics exports: Total exports value of electronics from India was INR 412bn in FY18 and INR 1,834bn in FY23, a CAGR of 35%. India's electronics exports should see substantial CAGR of 45% from FY23-27. The top-3 products in exports are mobile phones, engine control units, and industrial machinery. Globally, India ranks second in mobile phones manufacturing, which involves design, assembly, and manufacturing processes.

Exhibit 5. Country wise ranking in electronic exports

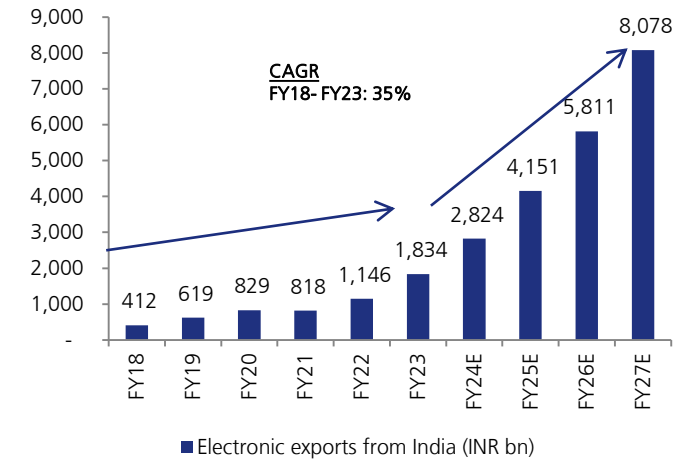
Country	Rank as Global Exporter		Electronics Exports,2021 (USD bn)
	2015	2021	
China	1	1	902.7
Hong Kong, China	2	2	452.4
Taiwan	6	3	252
USA	3	4	219
South Korea	4	5	205.8
Singapore	5	6	186.3
Germany	7	7	160.7
Vietnam	12	8	131.2
Japan	8	9	117.6
Malaysia	10	10	116.9
Netherlands	11	11	93.1
Mexico	9	12	90.5
Thailand	13	13	53.8
Czech Republic	16	14	44.8
Philippines	21	15	41.4
India	**32**	**26**	**14.3**

Source: JM Financial, Industry

We except with increasing domestic manufacturing + component Eco-System + Lower operating cost, will lead to INDIA becoming TOP-5 exporting countries. In Mobile we have already touched 5th Rank in exports.

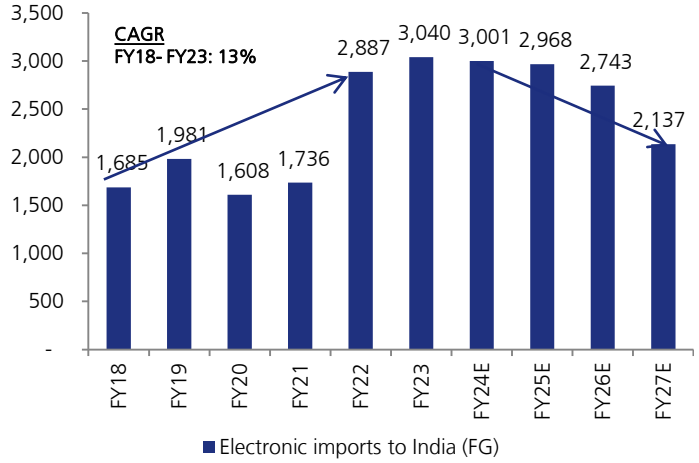
Electronics imports: Total imports value of electronics (finished goods) in India was at INR 1,685bn in FY18 and INR 3,040bn in FY23 (CAGR of 13%). China and Hong Kong accounted for nearly 70% of India's imports in FY20. The top-three imported products in India were laptops and desktops, FPD (flat panel display) televisions, and storage devices. Most components used in building notebooks and laptops were imported as SKD (semi-knocked down) units from China and Thailand. Industry expects FG imports to come down with increasing domestic production + value addition.

Exhibit 6. Electronics exports trend FY18-FY27



Source: JM Financial, Industry

Exhibit 7. Electronics imports trend FY18-FY27 (INR bn)

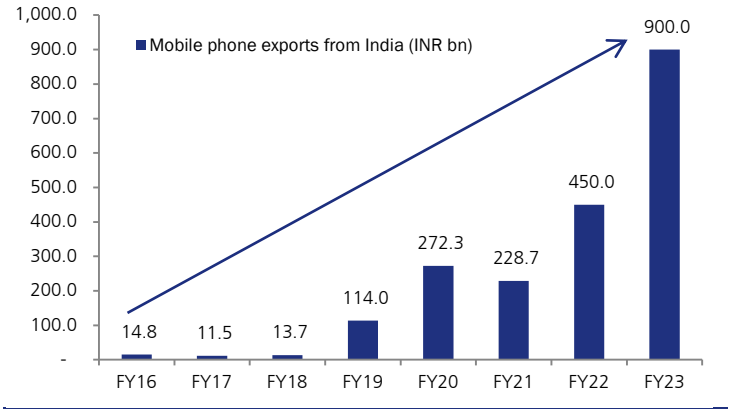


Source: JM Financial, Industry

Case Study 2: The mobile import-export data substantiates this claim as it comprises of a significant portion of the overall electronics trade.

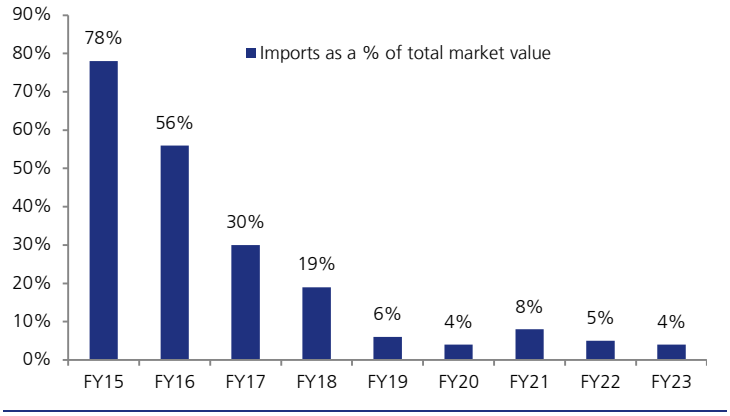
The central government, on 6th Oct'20, launched the Production Linked Incentive (PLI) Scheme for Mobile Phones, which offers incentives of 4-6% on incremental sales over a period of 5 years. Under the scheme, over the next 5 years, the approved companies are expected to produce phones worth more than INR 10,500 bn; of this, around 60% will be exported. The growth of the ecosystem will, subsequently, add significantly higher numbers. We expect with increasing focus on component eco-system by the government - Domestic value addition is expected to grow from the current 15-20% to 35-40% in the case of mobile phones. Additionally, other products like Laptops. Consumer durables, B2B Electronics will see higher value addition.

Exhibit 8. Mobile phone exports has seen a CAGR of 80%



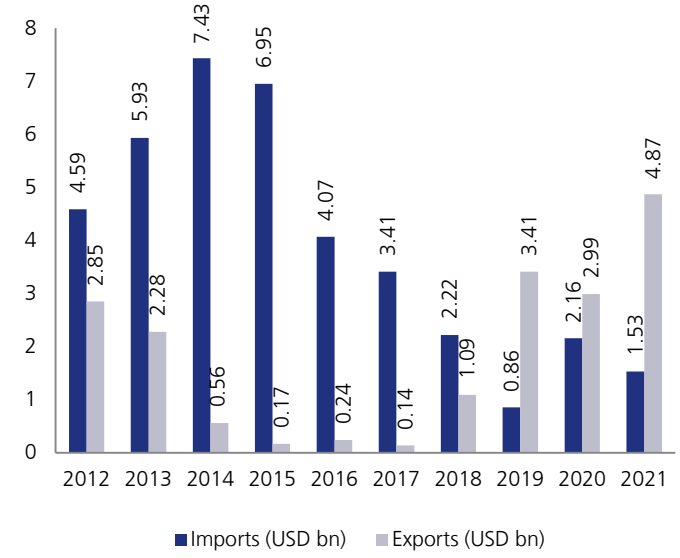
Source: JM Financial, Industry

Exhibit 9. Declining trend of imports as % of total market value



Source: JM Financial, Industry

Exhibit 10. India journey of mobile phone exports & imports



Source: JM Financial, Industry

Exhibit 11. Manufacturing remain the larger opportunity..

(US$ bn)	2020-21	2025-26	Growth (x)
Mobile exports	3.1	52-58	16.8-18.7
Electronics exports	10.6	105-130	9.9-12.3
Mobile domestic sales	27	63	2.3
Electronics domestic sales	65	150-180	2.3-2.8
Mobile production	30	126	4.2
Total electronics production	**74.7**	**300**	**4**

Source: JM Financial, Industry, Vision document ICEA

Exhibit 12. India ranking has improved to 5th rank in FY23 vs 178th in FY16

Particular	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23
India ranking of exports of mobile phone	178	239	19	19	8	9	9	5

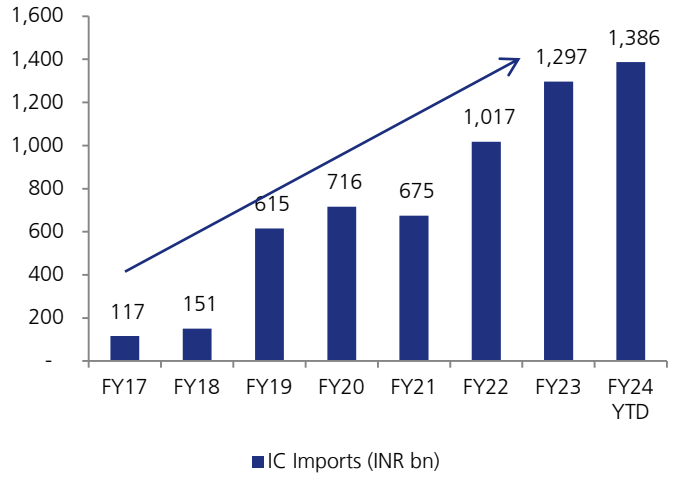
Source: JM Financial, Industry, Department of commerce, GOI

We have already improved the ranking in mobile phone and we expect ranking to improve for other electronic segments too

Case Study 3: Reduction in imports of FG but increase in imports of components

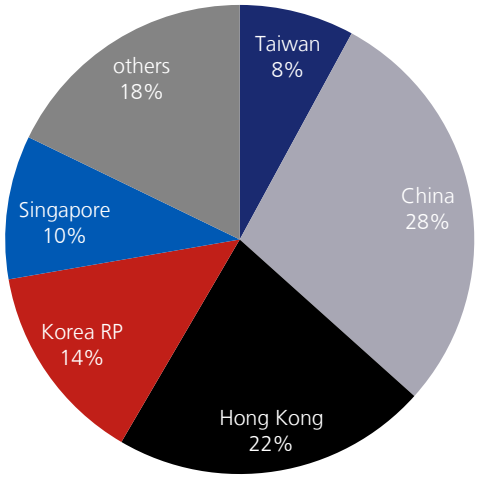
Imports of integrated circuits (ICs) saw CAGR of 49% over FY17-23 to INR 1.3trln – A testimony to the pick-up of manufacturing in India. This was due to increasing manufacturing of electronics/mobile phones in India and Indian EMS companies exploring export opportunities. CAGR of imports from Taiwan/China/HongKong/Korea/Singapore was c.40%/ 41%/ 100%/ 32%/ 39% and the share of Hong Kong as % of overall imports increased to 22% in FY23 from just about 2% in FY17. However, with India developing its component ecosystem, ICs will soon be produced in India. This should result in better supply-chain management and better working capital for electronics manufacturers in the country. We except with Semiconductor policy, IC imports will see reduction over next 2-3 years.

Exhibit 13. IC import reported a CAGR at c.49% over FY17-23



Source: JM Financial, Industry, note YTD is upto Dec'23

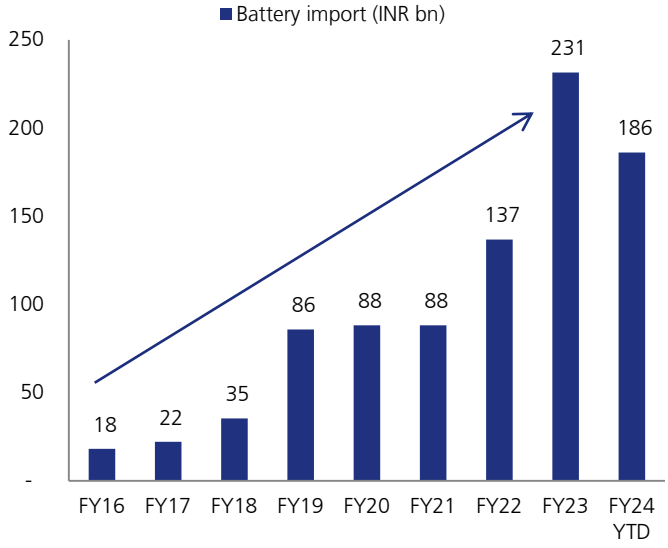
Exhibit 14. Major countries from where ICs are imported



Source: JM Financial, Industry

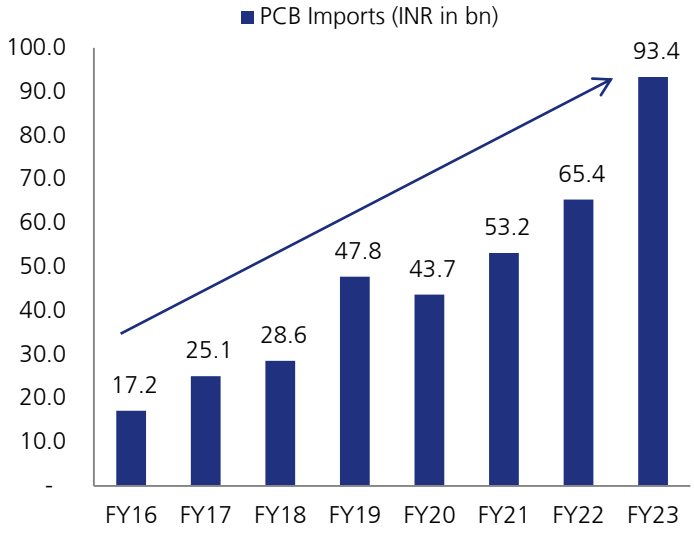
Other components like – Batteries, PCB has also seen strong growth in imports. However, we expect with GOI focus on component manufacturing in India, we see significant reduction in imports of these components over next 3-4 years.

Exhibit 15. Battery imports witnessed CAGR of 44% over FY16 to FY23



Source: JM Financial, Industry

Exhibit 16. PCB imports reported a CAGR of 27% over FY16 to FY23



Source: JM Financial, Industry

Exhibit 17. PCB import country wise; strategic shift witnessed from China

Countries	2014	2019	CAGR (FY14-19)	2023	CAGR (FY19-23)
China	10.4	23.0	17%	40.3	15%
Taiwan	1.8	1.2	-8%	6.0	49%
Hong Kong	1.4	13.0	56%	25.1	18%
Thailand	0.5	1.1	17%	2.0	17%
Korea	0.5	4.9	61%	5.9	5%
U S A	0.3	0.8	25%	0.7	-5%
Japan	0.3	0.3	6%	0.8	23%
Vietnam	0.0	1.6	263%	2.8	14%
Ireland	0.0	0.0	-3%	4.8	626%
% of total	**93%**	**96%**		**95%**	

Source: JM Financial, Industry

India has shifted the imports of PCB from China to Taiwan, Thailand, Vietnam and Japan

Policy initiatives to support manufacturing in India

Policy initiatives taken by India towards incentivizing localization in India

- Production linked incentive (PLI) scheme
- Scheme for Promotion of Manufacturing of Electronic Components and Semiconductors (SPECS)
- Merchandise exports from India scheme (MEIS)
- Modified Electronic Manufacturing Clusters Scheme (EMC 2.0)
- Phased Manufacturing Programme (PMP)
- Modified Special Incentive Package (M-SIPS)
- Design Linked Incentive (DLI) Scheme
- Gujarat Semiconductor Policy 2022-27

Long-term goals in electronic manufacturing

- Make-in-India for the world
- Make India the #1 electronics manufacturer and exporter
- Become a significant player in the global supply chain
- Build ecosystem comprising primarily of mobile phones, IT hardware, and consumer electronics of USD 1tn in next 10 years

Short-term goals in electronics manufacturing

- Build competitiveness and scale
- Shift and develop sub-assemblies and components ecosystem
- Build a design and components ecosystem
- Nurture Indian champions
- Steadily remove disabilities in IndiaPolicy initiatives taken by India towards incentivising localisation

Exhibit 18. Roadmap to manufacture USD 300bn electronics FY26

Product segment (in USD bn)	2021	2026	CAGR (2021-26)
Mobile phones	30	126	33%
IT hardware (laptops, tablets)	3	25	53%
Consumer electronics (TV and audio)	10	23	18%
Strategic electronics	4	12	25%
Industrial electronics	11	25	18%
Wearables & Hearables	0	8	140%
PCBA	**1**	**12**	**64%**
Auto electronics	6	23	31%
LED lighting	2	16	52%
Telecom equipment	0	12	127%
Electronic components	9	18	15%
Total	**76**	**300**	**31%**

Source: ICEA, JM Financial, Industry

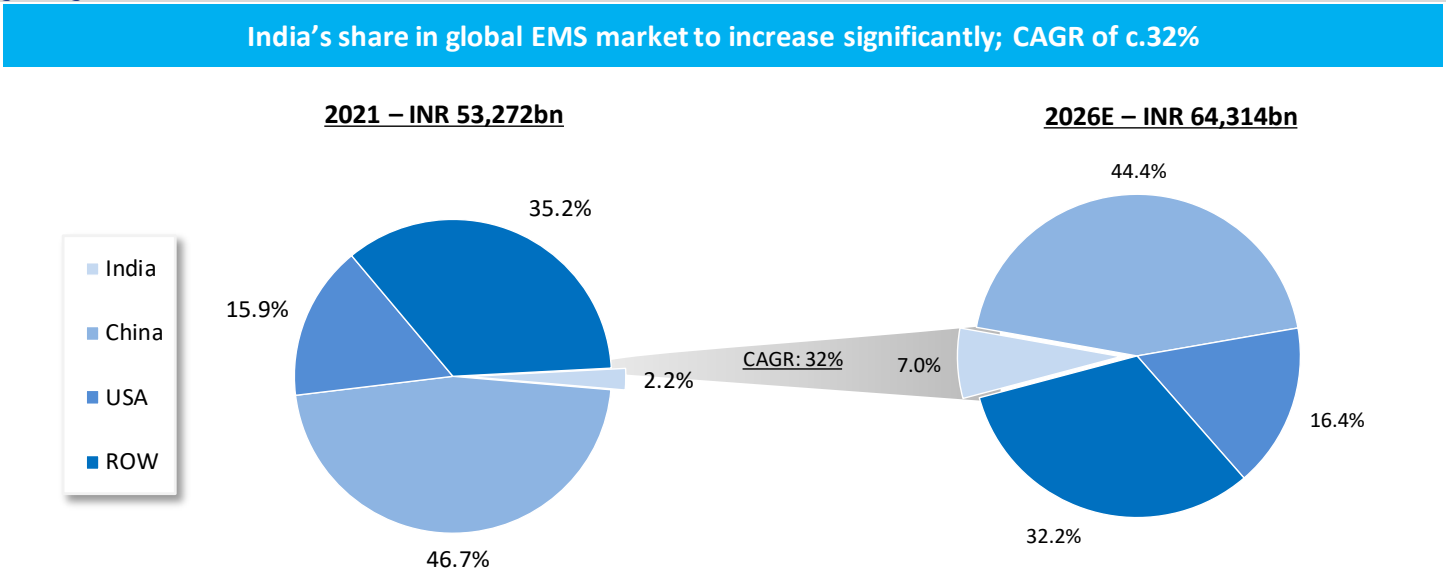
Exhibit 19. Government policy to boost electronic and semiconductor manufacturing

Name of The Policy	Year	Total Outlay (INR bn)	Revenue/Investment Linked Incentives	Capex Incentives	Minimum Investment	CG	SG	Overview of Scheme
Phased Manner Programme (PMP)	2017			NA	NA	Yes	NA	Incentivizing manufacture of electronics components by raising basic customs duty on imports
Modified Electronics Manufacturing Cluster (EMC 2.0)	2020	37.62		1. EMC Project : 50% of Cost - Max INR 3.5bn/ per project 2. Common Facility Center (CFC) : 75% of cost, max INR 750mn	1. Minimum Land required - 200acres (100 acre in North East, Hills & UT). 2.Minimum Invt by Anchor Unit - INR 3bn (INR 1.5bn for North East, Hills & UT)	Yes	Yes	To make India an Electronics Manufacturing Hub; EMC 2.0 Scheme has been notified with the objective to address the disabilities, by providing support for creation of world class infrastructure along with common facilities and amenities, including Ready Built Factory (RBF) sheds / Plug and Play facilities for attracting major global electronics manufacturers along with their supply chain to set up units in the country.
Scheme for Promotion of Manufacturing of Electronic Components and Semiconductors (SPECS)	2020	32.85		25% on reimbursement basis	INR 50mn to INR 10bn	Yes	NA	Electronic components, semiconductor/ display fabrication units, ATMP units, specialized sub-assemblies and capital goods for manufacture of aforesaid goods. Mobiles and Consumer Goods excluded.
Production Linked Incentive Scheme (PLI) for Large Scale Electronics Manufacturing	2020	409.5	4% to 6% on incremental sales (over base year) of goods manufactured in India for 5 years subsequent to the base year.	NA	Mobile Phones (over 4 years) - Global Player : INR 10bn - Domestic : INR 2bn Electronic Components: INR 1bn	Yes	NA	To boost domestic manufacturing and attract large investments in mobile phone manufacturing and specified electronic components, including Assembly, Testing, Marking and Packaging (ATMP) units
PLI for White Goods & LED	2021	62.4	4% to 6% on incremental sales (over base year) of goods manufactured in India for 5 years subsequent to the base year.	NA	(1) AC Components - Large Investment: INR 6bn - Normal Investment: INR 3bn. (2) High Value Intermediates of AC - Large Invt: INR 4bn - Normal Invt: INR 2.5bn (3)Lower value Intermediates of AC - Large Invt: INR 1bn - Normal Invt: INR 500mn (4) LED (Components) - Large Invt: INR 3.25bn - Normal Invt: INR 1.1bn	Yes	NA	Scheme for promotion of domestic manufacturing of Air Conditioners and LED Lights in India
Production Linked Incentive Scheme - PLI 2.0 for IT Hardware	2023	170	4% to 2% / 1% on net incremental sales (over base year) for 6 years of goods manufactured in India	NA	Global: 5bn Hybrid: 2.5bn Domestic: 200mn	Yes	NA	The Scheme shall extend an average incentive of around 5% on net incremental sales (over base year) of goods manufactured in India and covered under the target segment, to eligible companies, for a period of six (6) years. The Target Segment under PLI shall include (i) Laptops (ii) Tablets (iii) All-in-One PCs (iv) Servers and Ultra Small Form Factor (USFF)
Semiconductor								
Semiconductor Fabs	2023	INR 820bn (USD $ 10bn)	Minimum Revenue > US$ 1bn	Capex CG : 50% SG: >20%	Investment > INR 205bn (US$ 2.5bn)	Yes	Yes	To promote Semiconductor Ecosystem (1) Wafer Size: 300mm (2)Capacity: 40K WSPM
Display Fabs			NA		NA	Yes	Yes	Minimum Requirements (1) Technology: 8th Generation/above (for TFT LCD) or 6th generation/above (for AMOLED) (2) Capacity (Panels/month): >=60K panels/month (For TFT LCD) or >=30k (for AMOLED)
Compound & Discrete Semiconductor			NA		Minimum Investment: INR 1bn (US$ 13mn)	Yes	Yes	Minimum Requirement (1) Wafer Size: 150/200 mm (2) Installed Capacity: >500 WSPM
Packaging OSAT/ATMP			NA		Minimum Investment: INR 533mn (US$ 6.5mn)	Yes	Yes	Minimum Requirement Technology: Flip Chip, Embedded Die, 2.5D/3D, Fan-outs, Packaging, Chiplet, SiP, etc.
States Like - Gujarat, Uttar Pradesh, Odisha, Telangana, Assam & Kerala		INR 80bn	NA			NA	Yes	
Total Outlay (INR bn)		**1,612**						

Source: JM Financial, Industry

An extensive opportunity for players in the India EMS sector.

Exhibit 20. The global electronics manufacturing services (EMS) market should touch INR 64trn by FY26 with the Indian EMS market outpacing global growth

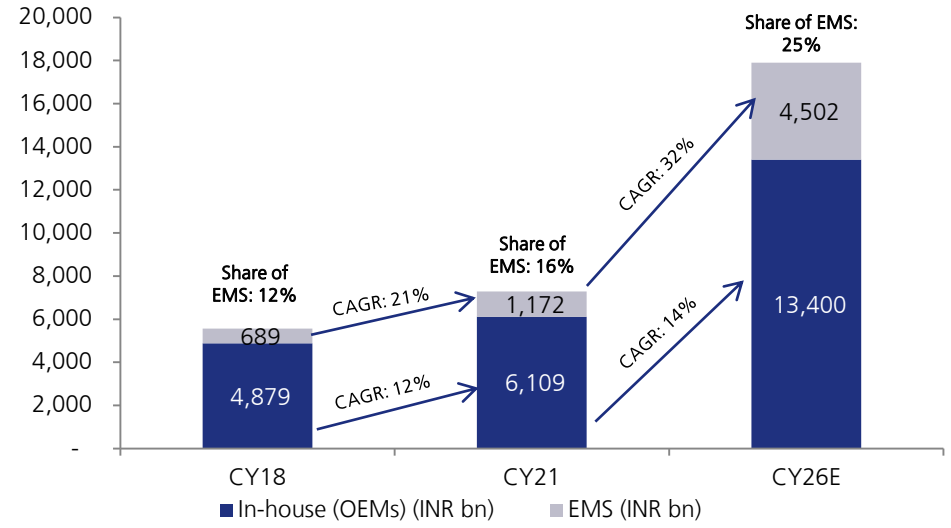


Source: JM Financial, Industry, Company

Key growth drivers for Electronic Manufacturing Services in India:

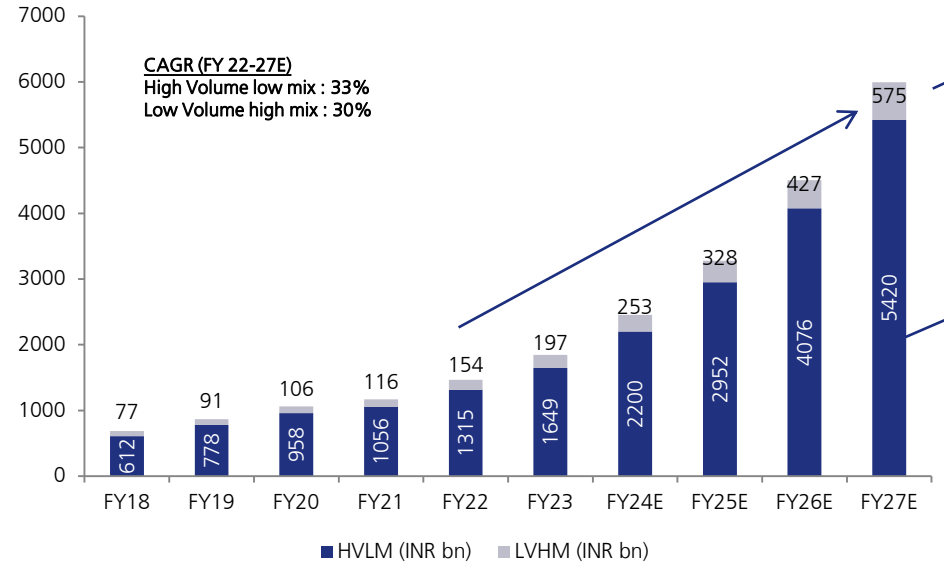
- Import substitution
- Supportive government policy
- Ease of doing business
- Enhancing local value addition
- China +1 strategy
- Exports focus on USD 5trln GDP
- Increase in investments by local and global players
- A huge workforce with relatively very low wages compared to the global average

Exhibit 21. Indian EMS industry to report a 32% CAGR over CY21-26E



Source: JM Financial, Industry

Exhibit 22. India EMS market split (HVLM vs. LVHM)

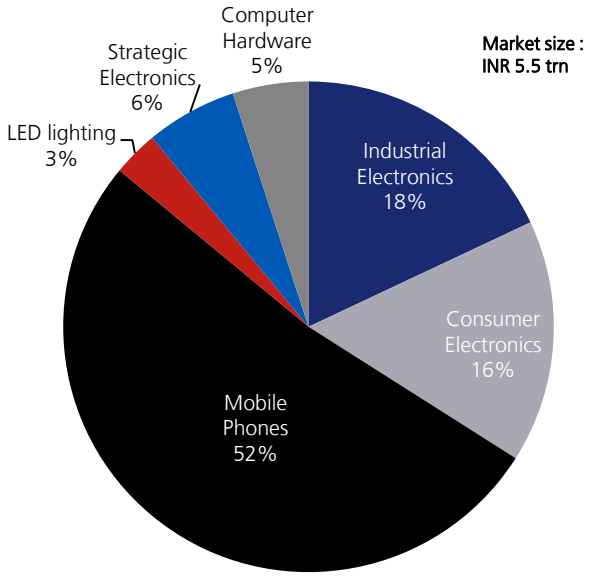


Most companies in the LVHM space caters to the needs of critical applications in industrial, medical, aerospace and defence segments. We expect the TAM of this segment to increase significently with new segment addition.

Most companies in the HVLM space cater to the needs of mobiles, computer peripherals, consumer devices, storage devices, etc.

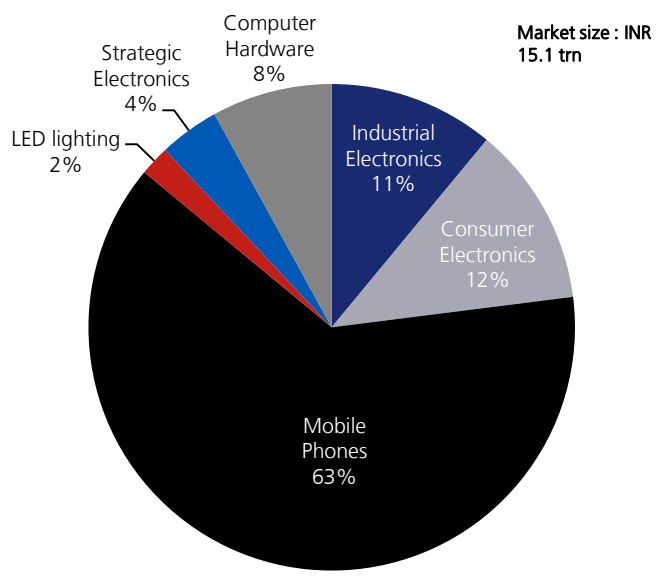
Source: JM Financial, Industry

Exhibit 23. Electronic manufacturing split by product segments (FY21)



Source: JM Financial, Industry

Exhibit 24. Electronic manufacturing split by product segments (FY26)

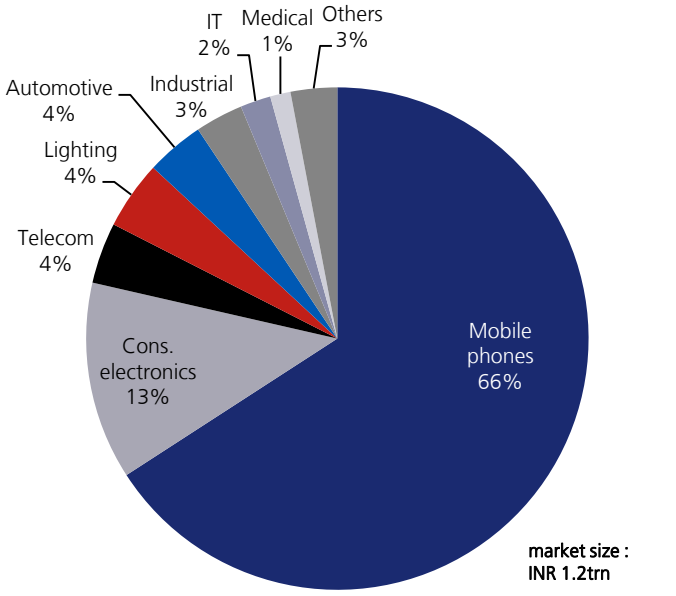


Source: JM Financial, Industry

Currently, In Indian EMS market we are not factoring the opportunity for new segments like - Smart Meters, EV etc.

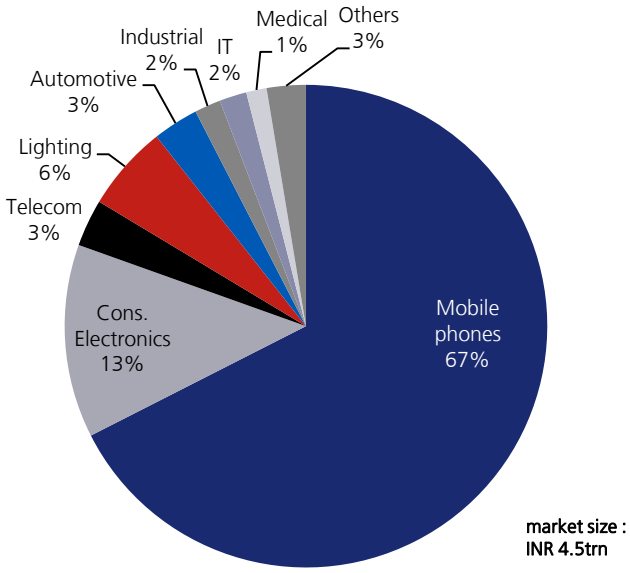
For Eg.: GOI wants to install 250 mn smart meters by FY-26. One smart meter has PCBA opportunity of INR 1,500-2,000/- (JM Est), the total opportunity from smart meters will be INR 375bn-500bn.

Exhibit 25. EMS market by key segment in FY21



Source: JM Financial, Industry

Exhibit 26. EMS market by key segment in FY26



Source: JM Financial, Industry

Exhibit 27. The EMS industry in India should see a CAGR of c.34% over FY23 to FY27

EMS market break-up by industry applications (INR bn)	FY18	FY19	FY20	FY21	FY22	FY23E	FY24E	FY25E	FY26E	FY27E
Automotive	26	33	40	48	66	85	109	140	180	240
Industrial	28	33	37	40	58	69	82	97	115	155
Telecom	40	44	49	47	57	67	79	93	109	145
Medical	10	13	14	16	23	32	46	66	94	125
Aerospace & Defense	11	14	20	27	37	51	71	98	135	186
Others**	574	732	904	994	1,228	1,542	2,066	2,787	3,869	5,144
Total	**689**	**869**	**1,064**	**1,172**	**1,469**	**1,846**	**2,453**	**3,281**	**4,502**	**5,995**

Source: JM Financial, Industry, Note: ** others includes mobile phones, consumer electronics & appliances, IT hardware, lightings etc


PCBA
Domestic + Export opportunity for INDIA

PCBA: Domestic + Export opportunity for INDIA.

PCBA stands for Printed Circuit Board Assembly. It is the process of placing electronic components such as resistors, capacitors, integrated circuits, connectors, and other devices on their designated locations on the printed circuit board (PCB), and then soldering them in place to create a functional electronic circuit. PCBA is a crucial step in the manufacturing of electronic devices as it transforms the bare PCB into a fully operational electronic product.

PCBA is at the core of every electronic device – whether it is mobile phones, tablets, computers, routers, televisions, washing machines, refrigerators, or air conditioners. It has applications in many other industries such as automotive, railways, medical, power electronics, telecom, industrial, aerospace, and defence. To develop India as an electronics manufacturing hub, it is imperative to bring in as many manufacturing operations as possible, and PCBA is a key manufacturing activity. At the start of PCBA operations, value addition should be about 3-5%, which can climb to 15-20% within 2 years.

With semiconductors, OSATs, and bare PCBs coming to India in the next 2-3 years, we expect value addition to increase by 50-60%

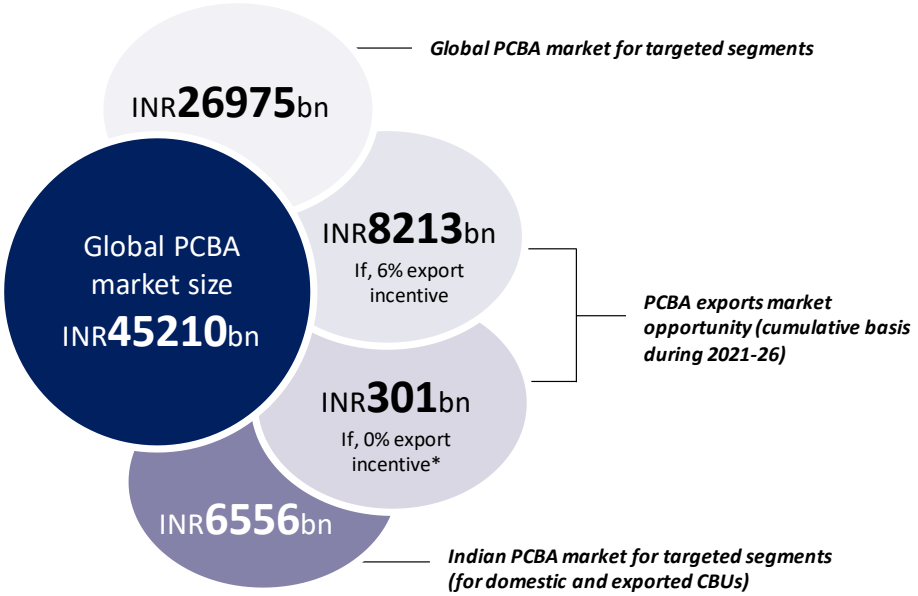
India's PCBA revenue CAGR to be c.38% over FY22-26.

We estimate that India PCBA market (ex. Mobile) is c.INR 800bn (Consumer + B2B).

Some of the key drivers of PCBA growth include:

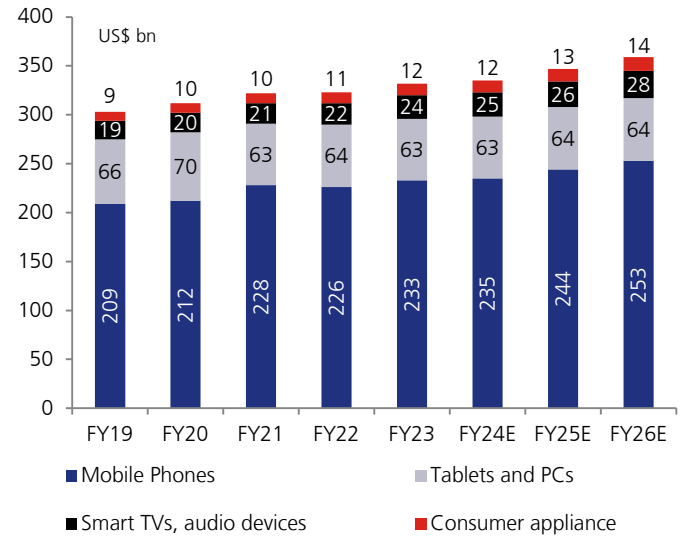
- Growth in 'value-added' products and services
- Increasing demand for electronic products globally

Exhibit 28. The business opportunity



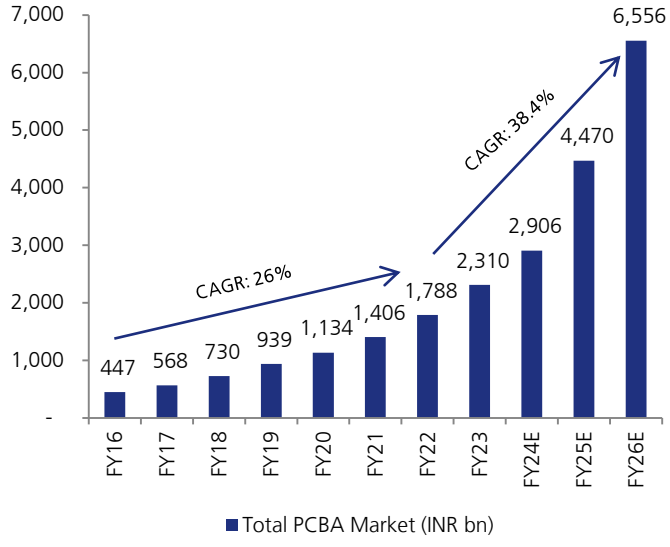
Source: JM Financial, Industry. NOTE: Targeted PCBA segment includes four product segments – mobile phones; tablets, notebooks and desktop PCs; Smart TVs, audio devices, video and music streaming devices; and Consumer appliances (washing machine, refrigerator, AC and heaters.

Exhibit 29. Global market size for PCBAs for the B2C segment



Source: Company, JM Financial

Exhibit 30. PCB assembly market in India – B2C

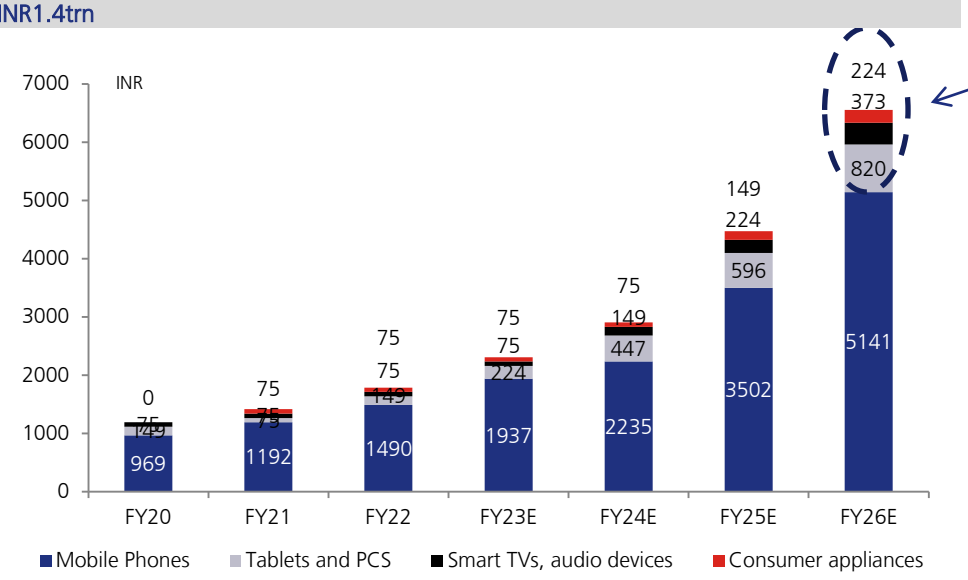


Source: Company, JM Financial

PCBA opportunity in the B2C segment

The government's efforts towards increasing localisation of electronics in India have led to more assembly work taking place in India than earlier. India has rapidly scaled down its imports of mobile phones and increased domestic manufacturing significantly in the last 3-4 years. As a result, import of populated PCBs used in mobile phones and telecom equipment has declined and exports are rising YoY. This is also reflected in the imports of IC and PCBs.

Exhibit 31. Indian market size for PCBAs for B2C segment; ex-mobile PCBA market is INR1.4trn

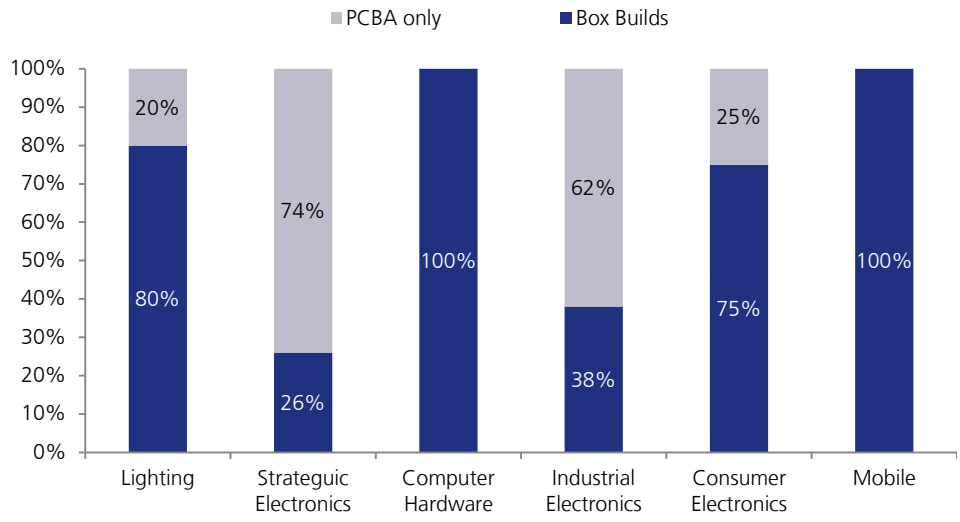


Source: JM Financial, Industry

This is the market in which major listed players like Kaynes, Syrma are present.

The listed EMS players have higher focus on B2B PCBA market.

Exhibit 32. The mix of box builds vs. PCBAs differs from product to products



Source: JM Financial, Industry, Note: In box build, an OEM outsources the complete product manufacturing process to an EMS company, which manufactures the final product, adds the OEM's logo and dispatches it to the OEM's warehouse for selling.

In India EMS companies are majorly making PCBAs and moving towards higher value-added services such a box-buildis. India has scales up its share of box builds tremendously in at least a few product segment such as mobile phones, lighting, computer hardware and consumer electronics

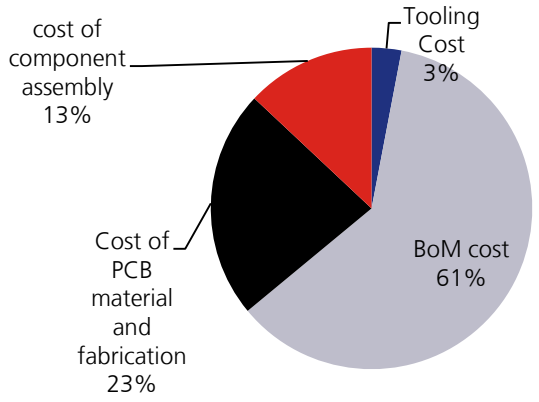
This is the focus area for listed EMS players like Kaynes, Avalon, Syrma and Cyient DLM

Exhibit 33. PCBA as a % of Bill of Material (BoM) cost

EMS market break-up by industry applications	PCBA as a % of BoM- JMFe
Mobile phones	45%
Consumer electronics	10%
Telecom	10%
Lighting	8%
Automotive	13%
Industrial	13%
IT	40%
Medical	25%
Others	20%

Source: JM Financial, Industry, note: others include some of A&D, energy etc.

Exhibit 34. Cost breakup of high volume PCBA



Source: JM Financial, Industry

Exhibit 35. Is India incentivising PCBA industry?

Factors resulting in cost-reduction	India	Vietnam	China
Corporate income tax exemption	0.7-0.9%	1.5-2%	2%
Subsidy for machinery and equipment	Nil	0.20%	3%
Cost of power	0.6-1.2%	NA	NA
Interest subvention on working capital	0%	1.5-2%	3-3.5%
R&D subsidy	0.15%	0.4-1%	2%
Incentive for supporting industry	0%	0.5-1%	0%
Exemption of land rental	0%	0.50%	0.60%
Industrial land development support	0.40%	0.50%	0.60%
Building	Nil	0.30%	1%
Labour subsidy	Nil	0.50%	2%
Logistics	0%	0.50%	1%
Factors affecting "ease of doing business"	0%	1.5-2.5%	2-3%
Duty free imports for creating fixed assets	0%	0.50%	0%
Incentive schemes	0%	0%	1-2%
Total	**1.9-2.7%**	**9.4-12.5%**	**19.2-21.7%**

Source: JM Financial, Industry

Government is incentivising localisation of PCBAs in India by:

- Supplying uninterrupted and consistent power.
- Freely allowing imports of plant and machinery for use in the PCBA industry.
- Permitting imports/exports of components freely and speedily.
- Improving infrastructure.
- Giving 6% export incentive, which will help build a global-scale PCBA industry in India

More government support needed for the PCBA ecosystem to thrive

Manufacturing PCBAs requires high-technology, capital-intensive Surface Mount Technology (SMT) and other machines, which need to work round the clock. If the government provides incentive support of 6% on exports, cumulative PCBA exports (FY 2021-26) for **India can touch c.USD 109bn for targeted segments (ICEA estimates). In 2019-20, India's PCBA export was USD 0.15bn.**

Electronics manufacturing to shift to India from China

Historically, the electronics industry had moved in search of lower manufacturing costs from the US – then to Japan, to Korea, to Taiwan, and eventually to China. In 2018, China had the largest share of 28.4% of the global manufacturing output. We believe there will now be a significant shift in operations – to India.

With many more companies setting up SMT capacity in India as well as undertaking manufacturing of box-builds solutions, we expect tremendous opportunities for the exports sector. Countries that were dependent on China, Vietnam, and other countries for box builds, as well as PCBAs, will now look at India as well.

As India gains scale in manufacturing, and as and when the component ecosystem develops in the country, the cost of production will come down further, making India the only low-cost alternative manufacturing destination for the world. PCBA players in India are already catering to North America, but with higher scale, we expect exports to start to countries in Europe as well.

Exports opportunity for PCBA

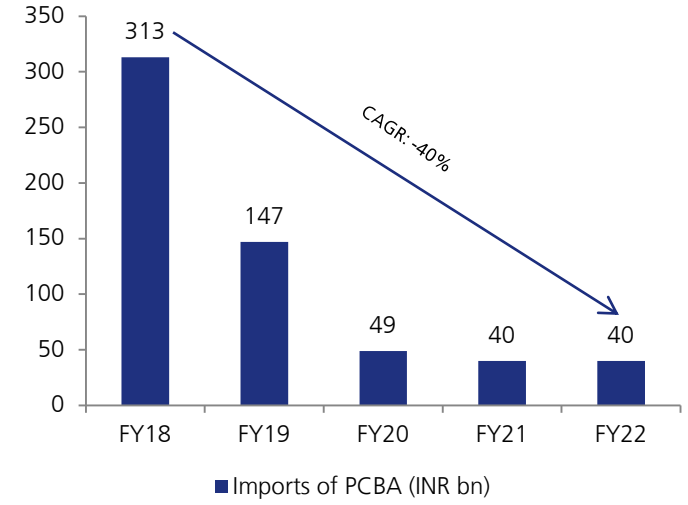
The National Policy on Electronics (NPE) in India aims to foster localisation and exports across the entire Electronic System Design and Manufacturing (ESDM) value chain, with a target turnover of USD 400 billion (approximately INR 26,000 billion) by 2025. As Printed Circuit Board Assembly (PCBA) manufacturing gains traction, backward integration naturally follows. This emphasis on catalyzing PCBA manufacturing represents a positive step forward. Once sufficient capacity is established for import substitution, there exists the potential for significant exports from India, contingent upon appropriate government support. The scale of operations is poised to positively impact the manufacturing ecosystem, attracting vendors supplying inputs for PCBA manufacturing, including components, PCBs, solder paste, cleaning agents, and other raw materials. With adequate scale, there is the prospect of a substantial boost to the design and manufacturing of multilayer PCBs in India.

In the realm of mobile/telecom, we observe a notable decrease in imports and a marked increase in exports, attributable to heightened value addition and substantial government backing through policies such as Production-Linked Incentives (PLI), among others.

China imported components and assembled them within the country for the world, creating jobs

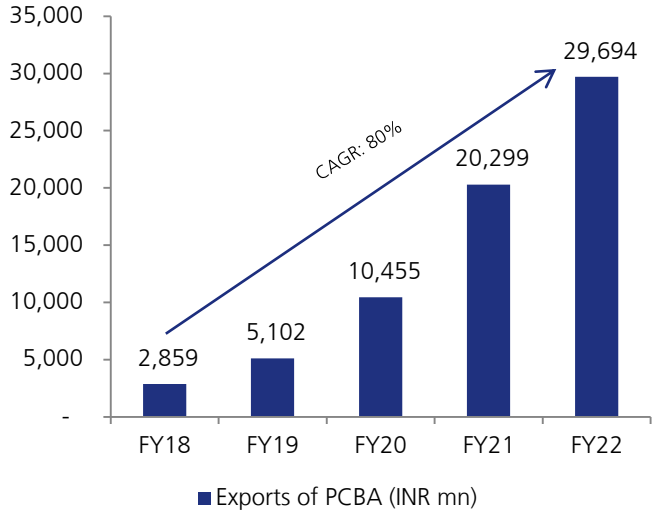
Similarly, by integrating "Assemble in India for the world" into Make in India, the country can raise its exports market share to 3.5% by 2025 and 6% by 2030

Exhibit 36. Imports of PCBAs used in mobile/telecom



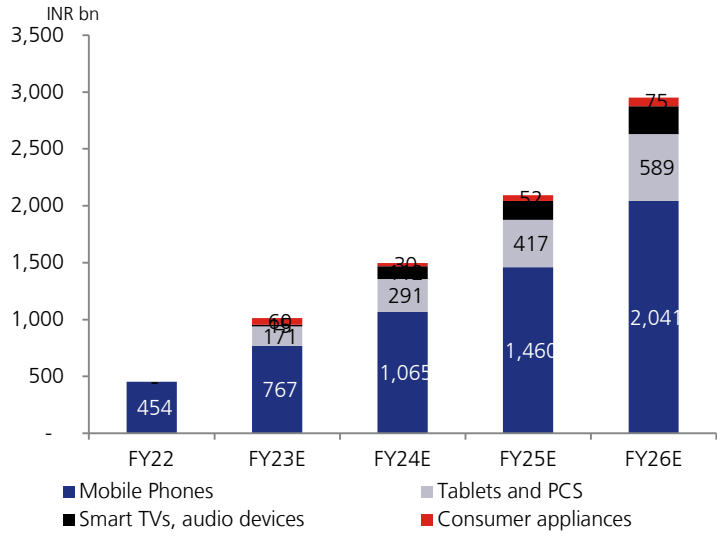
Source: JM Financial, Industry

Exhibit 37. Exports of PCBAs used in mobile/telecom



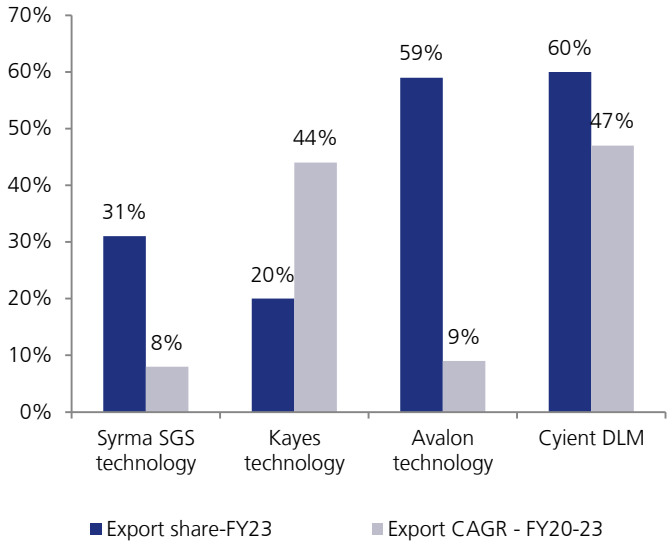
Source: JM Financial, Industry

Exhibit 38. Exports of PCBA from India for electronics to report 60% CAGR over FY22-26E



Source: JM Financial, Industry

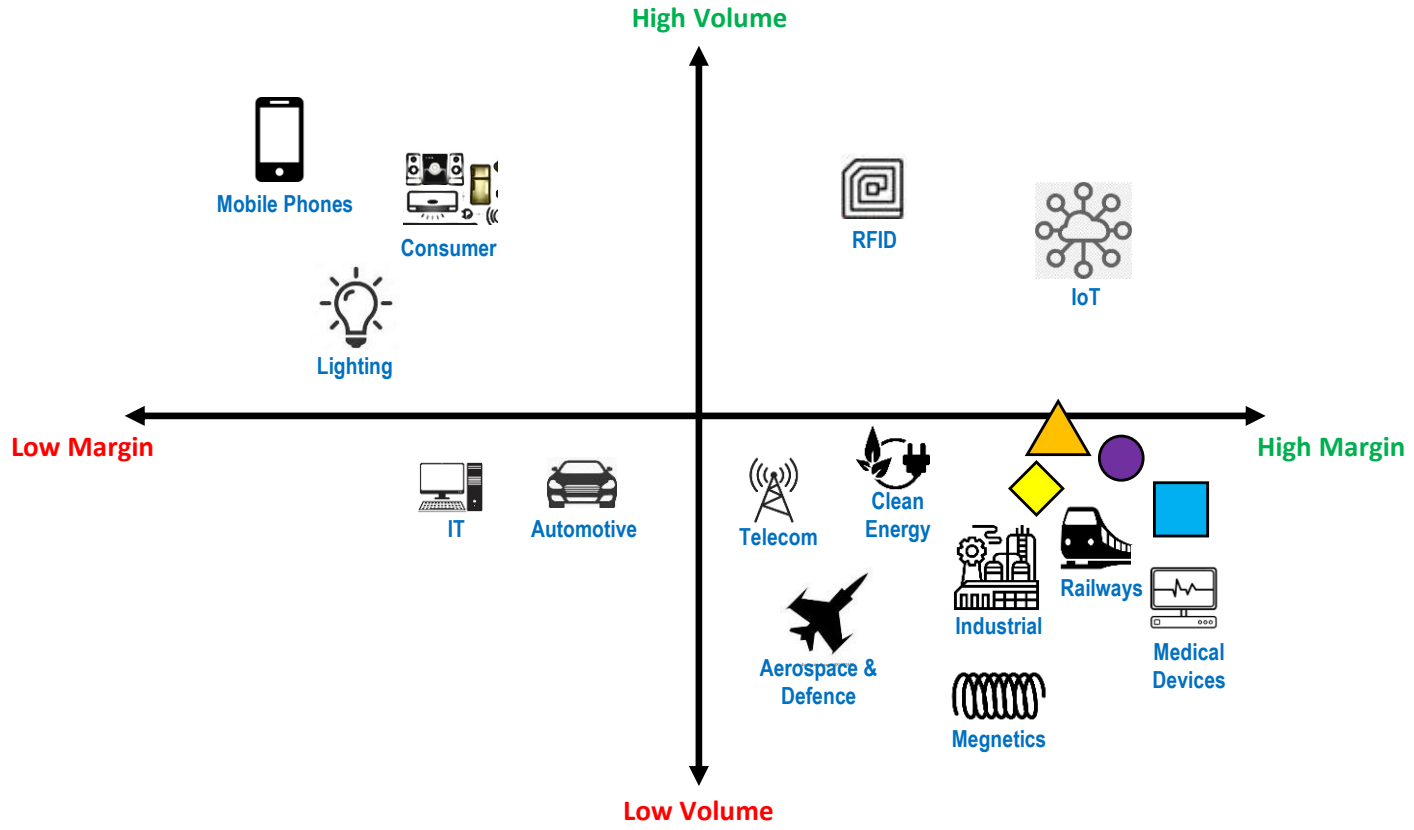
Exhibit 39. Exports have shaped up significant opportunities for Indian listed companies; Avalon and Cyient having the highest share



Source: JM Financial, Industry

Classification of application segments in volume and margin matrix

Exhibit 40. Volume-Margin matrix

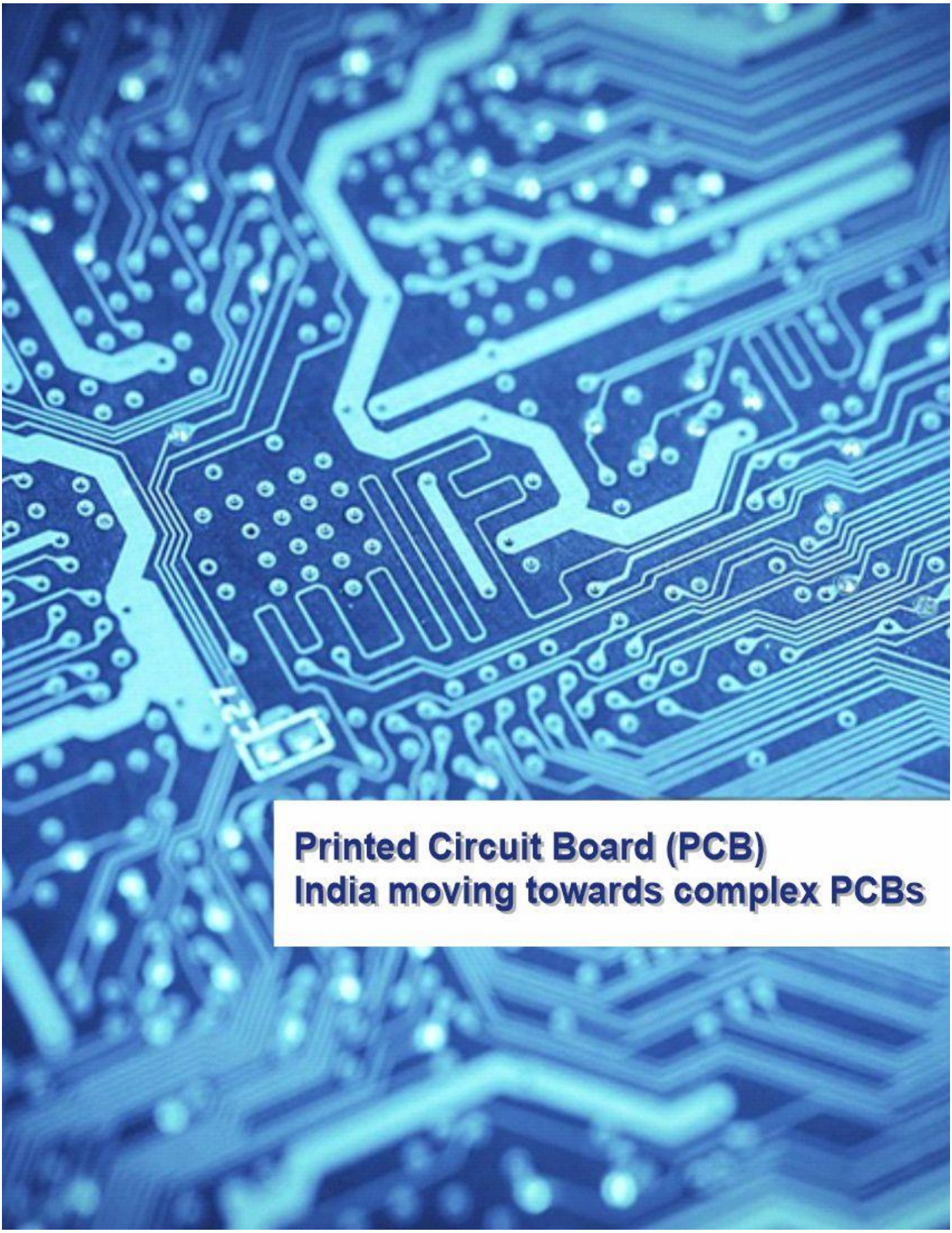


Source: JM Financial, Industry

Exhibit 41. Key players that we are covering work in high-margin segments

Revenue mix and margins	Syrma	Kaynes	Avalon	Cyient DLM
Automotive	19.7%	38.0%		
Industrial	31.4%	27.0%	30.5%	25.0%
Railways	1.8%	12.0%	21.6%	
Medical	8.0%	6.0%	7.7%	16.0%
IT/ IoT	7.0%	6.0%		
Consumer	32.2%	9.0%		
Clean Energy			21.7%	
Communication			8.5%	
Others			8.0%	
Aerospace & Defense		2.0%	2.1%	58.0%
Overall gross margin (%)	**24.8%**	**30.2%**	**35.8%**	**22.5%**
Overall OPM (%)	**9.2%**	**14.9%**	**11.9%**	**10.5%**

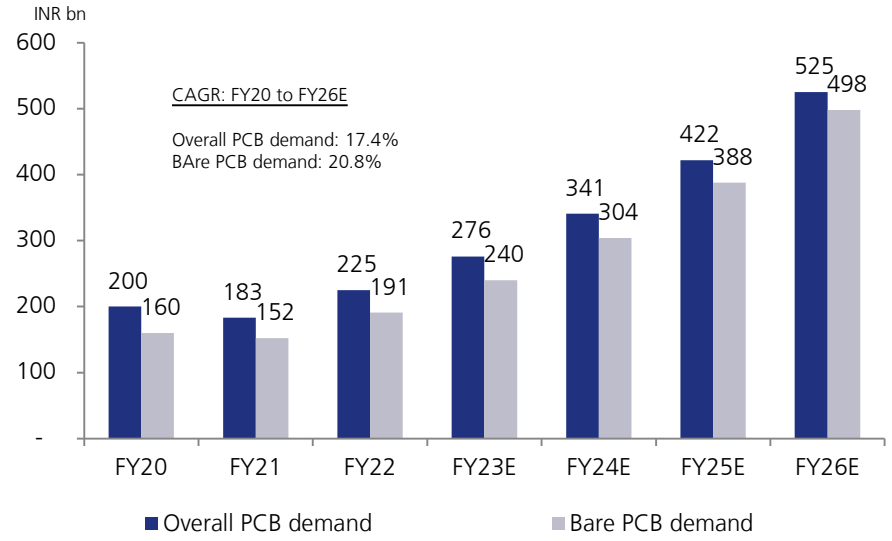
Source: JM Financial, Industry, Note numbers are updated as on FY23


Printed Circuit Board (PCB)
India moving towards complex PCBs

Printed Circuit Board (PCB): India moving towards complex PCBs

- Electronic manufacturing is gaining momentum in India, and since a PCB is the backbone of any electronic product, there will be rapid surge in demand for PCBs in India. Majority of the demand for PCB will be in the form of bare printed circuit boards, and their assembly will happen in India.

Exhibit 42. Domestic PCB demand likely to reach INR 525bn by FY26

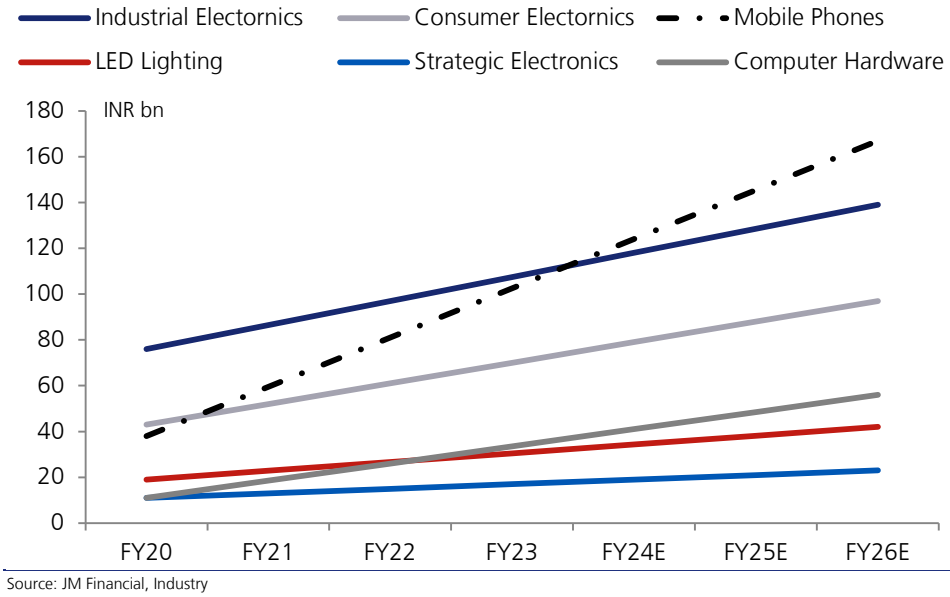


Source: JM Financial

Overall PCB demand is likely to grow at a CAGR of 17.4% to touch c.INR 525bn by FY'26. Bare PCB will account for more than 96% of this demand. Bare PCB demand is expected to grow at a CAGR of 20.8% to become c.INR 500bn in FY'26.

- Printed Circuit Boards (PCBs) come in various configurations, including single, double, or multi-layered designs. Single-layered PCBs represent the initial generation and are typically employed in basic electronic devices. However, as products have evolved in complexity, so too have PCBs. Multilayer PCBs have become commonplace, with smartphones often featuring up to sixteen layers, and advanced military electronic equipment possibly incorporating as many as a hundred layers. Components can be mounted on either one side of the PCB, termed single-sided PCBA, or on both sides, known as double-sided PCBA.

Exhibit 43. Computer and Hardware will see highest growth in PCB in next 2-3 years



Source: JM Financial, Industry

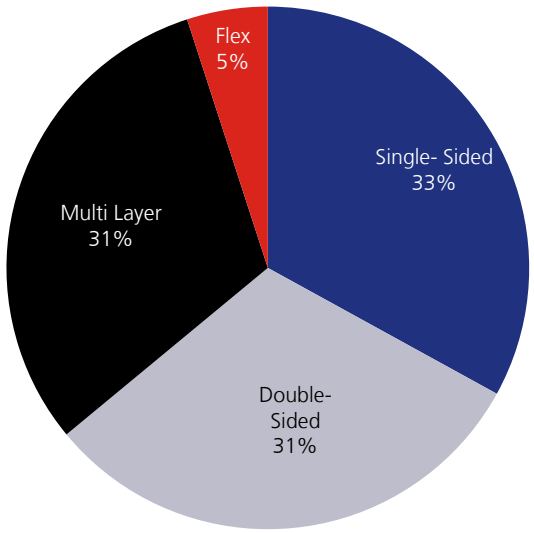
CAGR in domestic PCB demand
Computer Hardware: 30%
Mobile phones: 27%
Consumer electronics: 14%
LED Lighting: 12%
Industrial electronics: 10%
Strategic electronics: 9%

Most of the complex work still being done outside India

In FY20, single-sided and double-sided PCBs collectively represented nearly two-thirds of bare PCB utilization in India. This indicates that a substantial portion of intricate assembly tasks is still predominantly conducted outside India or imported into the country as PCB assemblies (PCBAs). However, this dynamic is undergoing a transformation, with the potential for significant expansion in the adoption of multi-layer PCBs in the forthcoming years. The market share of multi-layer PCBs, which stood at a mere 6% in FY19, surged to 31% in FY20, and has now surpassed 55% in FY23 (as per JM Estimations). Multi-layer PCBs find widespread application in mobile phones, televisions, medical electronics, and to some extent, in strategic electronics.

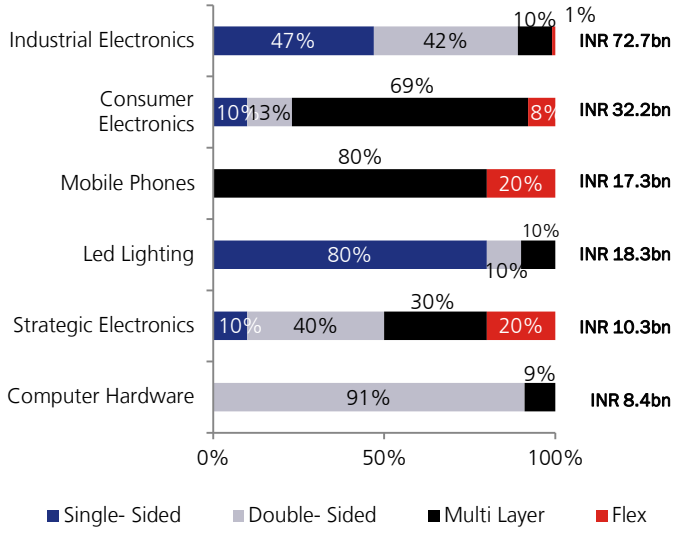
Manufacturing of complex PCBs in India will increase significantly. We expect players like Kaynes, Syrma, Epiton, Ascent (Amber JV), BPL, Avalon and Cyient DLM to enter into complex PCBs in the next 1-2 years

Exhibit 44. Bare PCB market split by type in India (FY20)



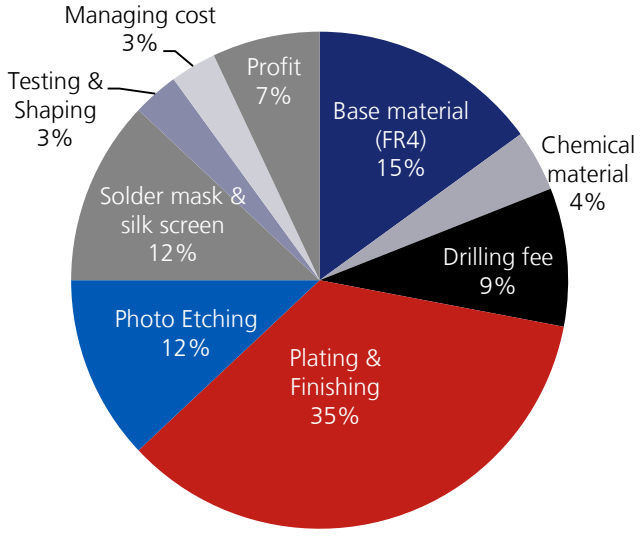
Source: JM Financial, Industry

Exhibit 45. Bare PCB market split by end user Industry (FY20)



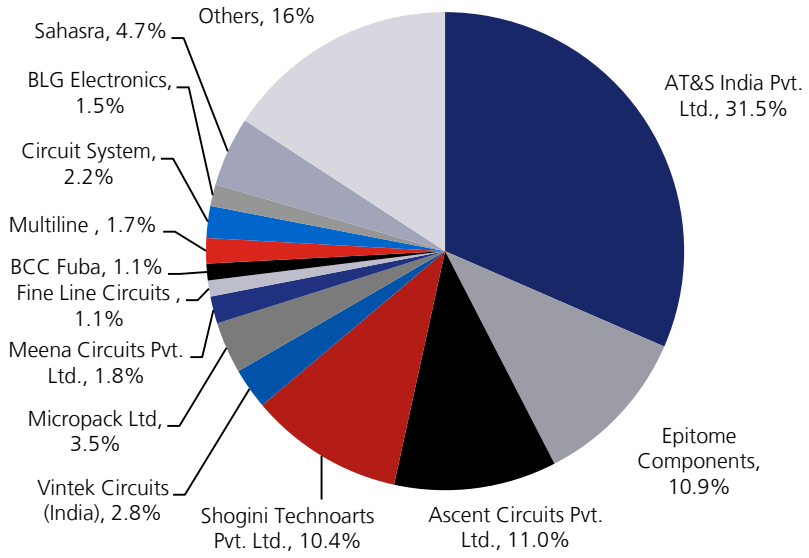
Source: JM Financial, Industry

Exhibit 46. Two Layer PCB cost break-down



Source: JM Financial, Industry

Exhibit 47. Bare PCB market split by domestic manufacturers in India



Source: JM Financial, Industry

Large part of the PCB demand in India is still met trhough imports

With increasing PCBA presence in India, bare PCBs+components manufacturing should increase

Exhibit 48. Financial data of leading PCB manfuacturer in India

(INR mn) As on FY23	Revenue	EBITDA	EBITDA Margin	PAT	PAT Margin	ROCE	ROE	Asset Turnover (x)
AT&S India Pvt. Ltd.	7,988	1,181	15%	268	3%	16%	18%	1.42
Epitome Components	2,761	464	17%	258	9%	21%	17%	1.52
Ascent Circuits Pvt. Ltd.	2,785	540	19%	305	11%	21%	16%	1.23
Shogini Technoarts Pvt. Ltd.	2,643	148	6%	2	0%	28%	1%	8.01
Vintek Circuits (India)	702	208	30%	137	20%	28%	25%	1.04
Micropack Ltd	884	275	31%	155	18%	23%	20%	0.9
Meena Circuits Pvt. Ltd.	466	-63	-14%	-94	-20%	-24%	NA	1.46

Source: JM Financial, Industry

Exhibit 49. Number of PCB companies in APAC region

PCB companies in APAC region	India	China	Vietnam	Thailand	Taiwan
PCB manufacturers	182	581	11	13	78
PCB assembly	154	211	13	13	35
PCB designers	113	90	6	1	7

Source: JM Financial, Industry

India already has strong capabilities in PCB assembly and designing, which will help the country to become the biggest beneficiary of the China +1 strategy vs. other EEs. With its entire focus on domestic manufacturing (Make in India), India has the potential to become a global manufacturing powerhouse, competing with China.


Insights on Semiconductor Industry

Insights on global semiconductor industry

The industry has five different segments – design, manufacturing, ATMP (Assembly, Testing, Marking, Packaging)/OSAT, logistics, and customers – which form a value chain; each segment feeds its resources down the chain to the next. It mainly relies on collaboration and trade between the United States, Taiwan, South Korea, Japan, Europe, and China. This value chain is highly innovative and efficient but not resilient.

Exhibit 1. Global Semiconductor Supply Chain

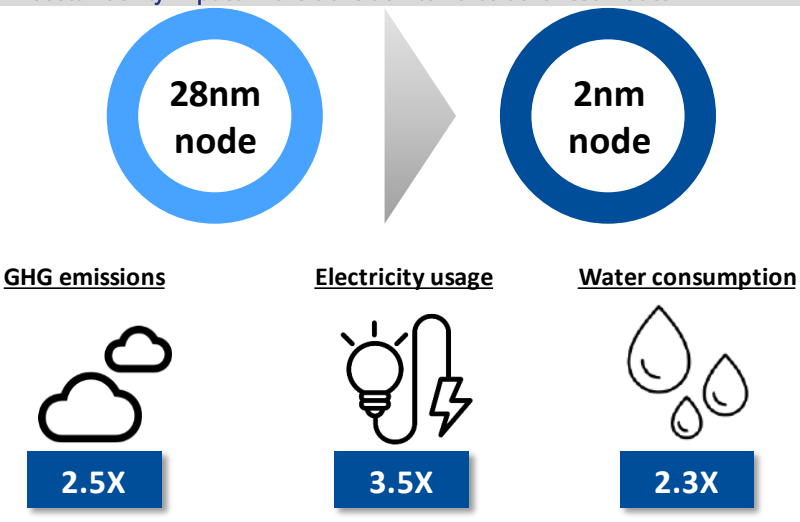
DESIGN	➢ Historically, the US has had the strongest chip design ecosystem, accounting for 53% of the global market. ➢ Design companies include both fabless (e.g.: Nvidia, Broadcom, Qualcomm, AMD, MediaTek, etc.) and IDM* (e.g.: Samsung, Sony, SK Hynix, Texas Instruments, Micron, Infineon, etc.)
MFG	➢ Front-end manufacturing, which involves manufacturing of chips, is carried out by foundries in their fabrication plants. ➢ Fabless companies, such as Qualcomm, NVIDIA, and HiSilicon, closely collaborate with foundries. ➢ The foundry market is dominated by a few top players concentrated in Taiwan and South Korea.
ATMP	➢ Back-end manufacturing involving assembly, testing, and packaging requires limited innovation and a small value add. ➢ Assembly, testing, and packaging are mostly outsourced to Asian countries (China being the largest OSAT market). ➢ The OSAT market is highly competitive, with several major players such as ACE, Amkor, and JCET.
LOGISTICS	➢ Due to the hyper-sensitive nature of wafers, the semiconductor industry requires logistics solutions. ➢ A few logistics companies service top global chip makers including Nippon Express (Japan), DHL (Germany), and Kuehne + Nagel (Switzerland).
CUSTOMER	➢ Semiconductors power all kinds of electronic devices and play an indispensable role in today's economy. ➢ Global applications include mobile phones, consumer electronics, PCs, ICT infrastructure, industrial, and auto. ➢ Mobile phones and ICT infrastructure constitute 50% of global semiconductor sales, followed by PCs (19%).

Source: : JM Financial, Industry, Aranca, *IDM – Integrated Device manufacturers who performs design + manufacturing + ATMP in-house (In the early decades of the industry, the IDM model was predominant, but the rapidly increasing size of the investments in both R&D and capital expenditure created the simultaneous need for both scale and specialization, which led to the emergence of the fabless-foundry model)

Semiconductors in everyday life: c.1k/3k semiconductors ranging from 10nm to 180nm are used in automobiles, 10+ semiconductors in coffee machines, and c. 165+ semiconductors in smartphones.

Sustainability: Semiconductor manufacturing is a resource-intensive sector, As demand for climbs and transistor density increases from node to node, electricity usage, water consumption, and greenhouse gases (GHGs) emitted per wafer are all projected to rise. Powering chips fabs and burning perfluorocarbons (PFCs), chemicals, and gases emit notable carbon emissions. Water usage and chemical wastage run high and recycling manufacturing by-products is costly and complex.

Exhibit 2. Sustainability impact in the transition towards advanced nodes



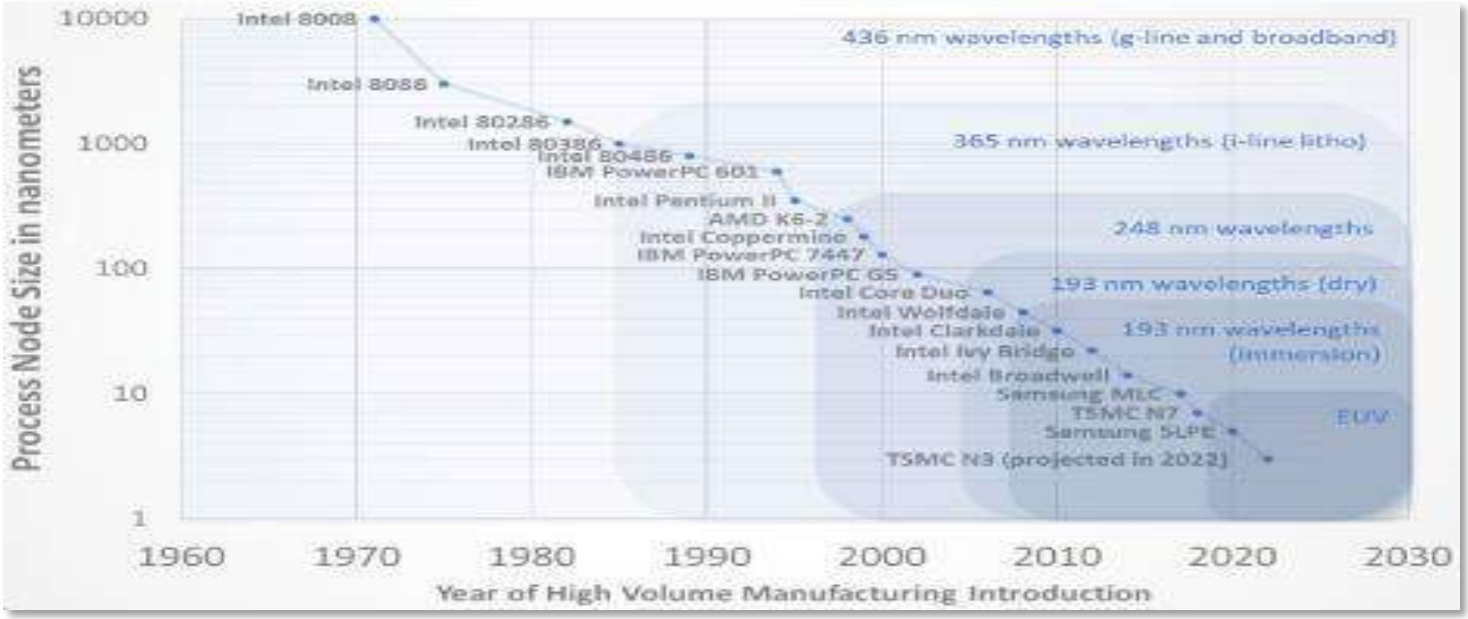
Source: JM Financial, Industry

Evolution of node size: Getting smaller and smaller

According to the International Roadmap for Devices and Systems, 2022 update, a 0.5nm equivalent node size on semiconductors will be necessary by 2037. Therefore, the ongoing trend for chip miniaturisation is likely to continue, as more energy-efficient solutions are in high demand to ensure that the ever-growing processing footprint remains sustainable.

Since the 1970s, semiconductor speed and performance has grown exponentially due to innovations

Exhibit 3. Evolution of nodes from 1960 to 2022: TSMC has been leading by developing the latest 3nm node

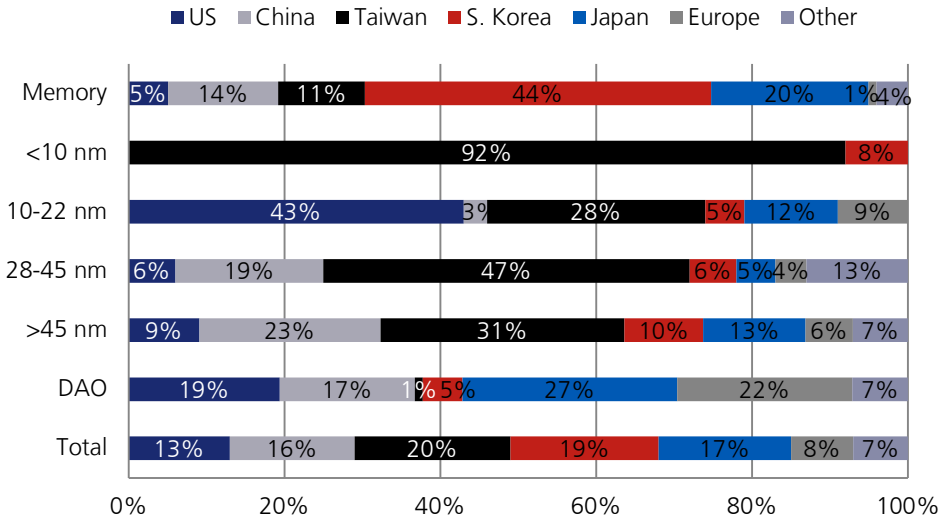


Source: JM Financial, Industry

Different chips are used for different purposes: Due to cost and complexity of advance node chips (16nm or smaller), **traditional chips** are preferred for some applications in the automotive industry, certain types of defence technology, aircraft, and consumer electronics. However, for advanced applications in artificial intelligence, quantum- and high-performance computing, and other critical and compute-heavy technologies, **advanced chips** are essential.

Country-wise node manufacturing capacity: The global semiconductor manufacturing industry is heavily concentrated in just five countries and only a few dozen companies.

Exhibit 4. Breakdown of the global wafer fabrication capacity by region, 2019: East Asia + China constitute c.75% of the wafer fabrication capacity; in particular, all advanced logic capacity < 10nm is currently located in Taiwan and South Korea



Source: JM Financial, Industry BCG, SIA, 1. Discretes, analog and optoelectronics and sensors 2. Other includes Israel, Singapore and the rest of the world. DAO - Discrete, Analog and Others.

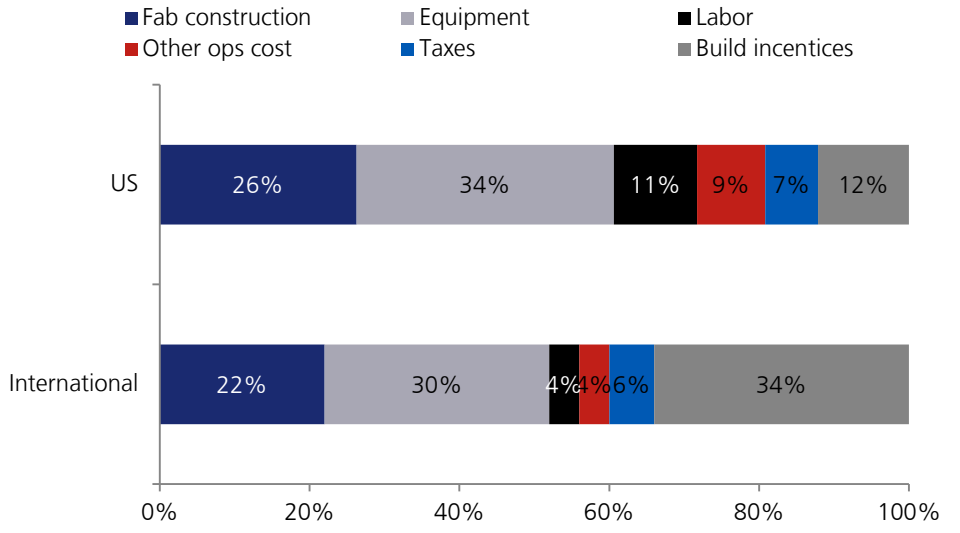
Many types of semiconductors, such as analog and mixed-signal (power supply and radio frequency (RF) chips, sensors and many more), do not depend on node shrinkage – they don't really benefit from being made smaller

Therefore, comparing fabs from Texas Instruments, Analog Devices or Infineon (several of the leading analog semiconductor companies) with fabs from Intel, Samsung or TSMC is comparing apples and oranges – because they are made for different needs

In the race for innovation, global players drop out as costs soar

As capex skyrocketed and technical knowhow became harder to acquire, fewer players survived in the advanced node space. Some decades ago, roughly 20 semiconductor companies (foundries and Integrated Device Manufacturers (IDMs)) produced chips at advanced nodes, but this declined significantly over time.

Exhibit 5. Cost breakdown of semiconductor fabs



Source: JM Financial, Industry

The economics of advanced wafer fabrication

- Skyrocketing costs of new fabs: Capital expenditure for a modern (5nm) fab is close to USD 20bn with annual operating expenditures of more than USD 1bn.
- High volume, high utilisation: To amortise such a huge investment within a few years, a fab needs a high utilisation rate. UMC, the second largest foundry in Taiwan, had quarterly utilisation rates of 93-99% in 2020.
- Increasing complexity and R&D intensiveness: Advanced logic fabs are more than just expensive equipment in gigantic cleanrooms. Ensuring rapid time to market, high yield rates (the percentage of "good" chips on a wafer after fabrication) and high utilisation rates, all at the same time, requires substantial process knowledge and managerial skills.

Major companies chose to focus on mature nodes

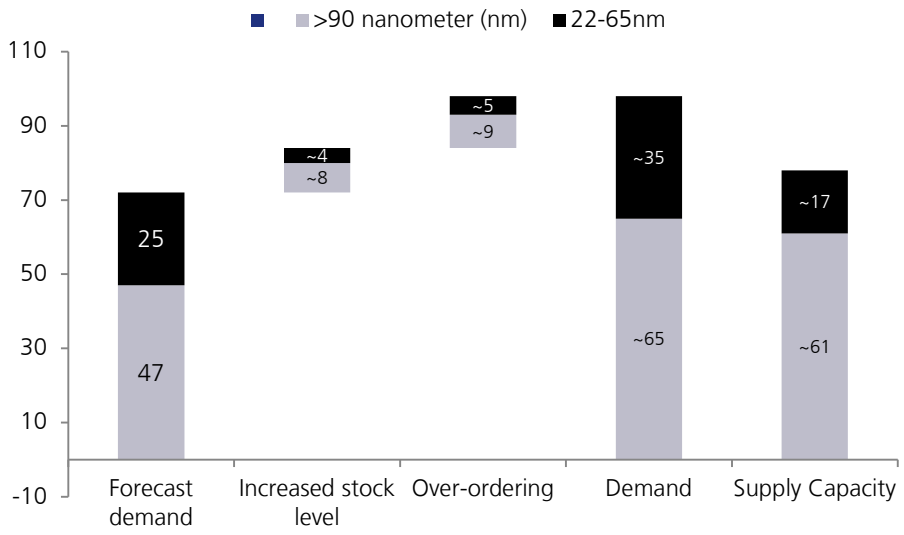
Due to rising costs and other manufacturing complexities, companies such as GlobalFoundries, ST, Sony, Infineon, Freescale, and NXP all strategically opted to build on the success they achieved at mature nodes, rather than sustain investment in leading-node technology. Today, only three firms successfully compete at manufacturing advanced nodes – TSMC, Samsung, and Intel. While the industry has experienced rapid growth in advanced nodes, growth in mature nodes has increased in the low single-digits, largely due to many trailing node-dependent end-markets (such as automotive), misjudged demand sensors, and underestimated lead times.

Mature node: Larger transistors, older tech; cost-effective for simpler applications

Advanced node: Smaller transistors, high performance; efficient for advanced electronics

Leading-edge node: Cutting-edge tech, smallest transistors; unlocks unprecedented device capabilities

Exhibit 6. Node-wise demand and supply,2022



Source: JM Financial, Industry

Of late, automotive companies have displayed a tendency to over-order semiconductors and increase stock levels – this is a contributing factor for supply-chain issues

The sector is expected to face a semiconductor shortage in technology nodes for up to five years, according to a McKinsey analysis

Global semiconductor market is worth USD 754bn

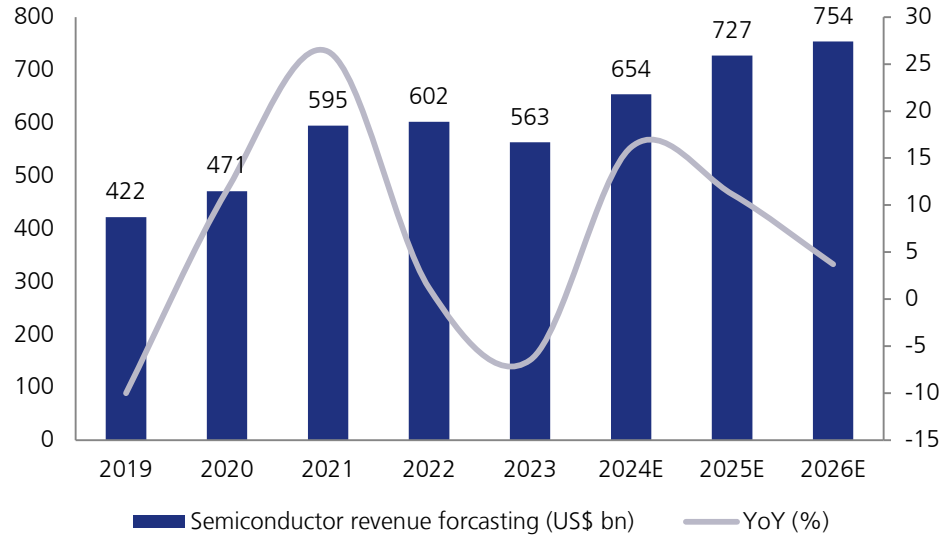
Global semiconductor revenue CAGR was 7% over FY19-23 and is likely to be 10% over FY23-26. The growth is driven by products ultimately purchased by consumers, such as laptops, smartphones, EVs, AI, etc.

Covid gave a major boost to demand for semiconductors: As remote work and school became common during the pandemic, demand shot up for semiconductor-enabled products, such as computers and other communication devices. The sales of chips used in consumer products grew by c.52% YoY over Apr'20 and Apr'21, while those used in communication/computers grew by c.32%/21% YoY respectively.

The top-five semiconductor suppliers contribute 42% of the USD 422bn in global chip sales revenue in 2019

Intel was the leader, followed by Samsung Electronics

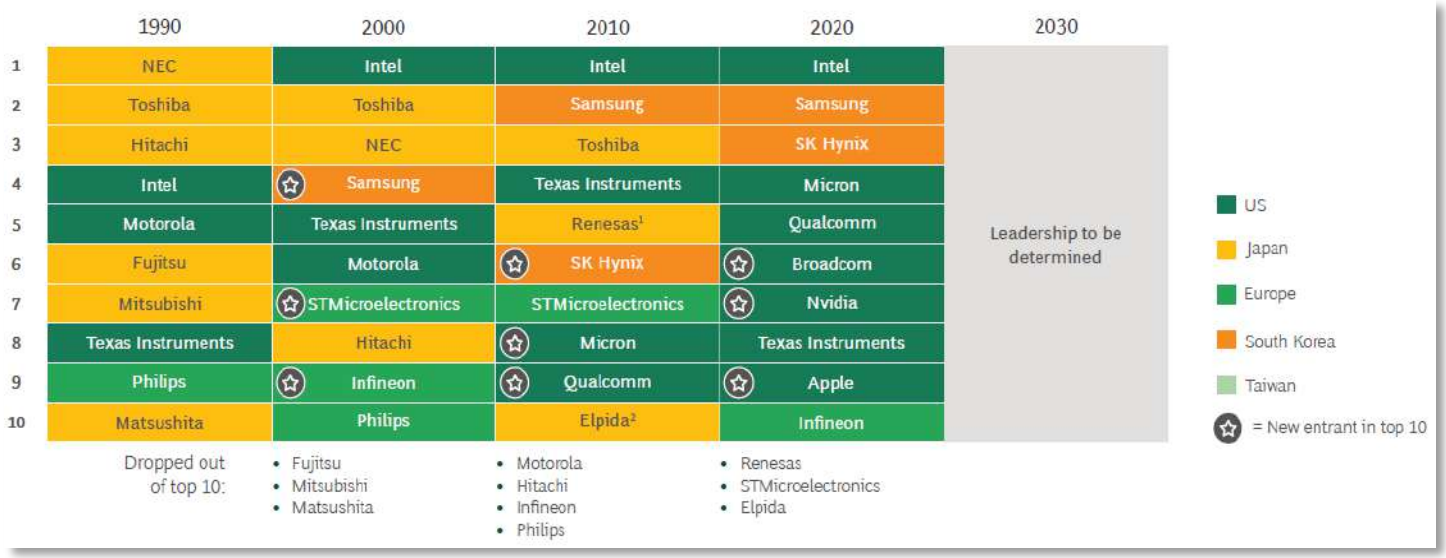
Exhibit 7. Global Semiconductor Industry revenue



Source: JM Financial, Industry

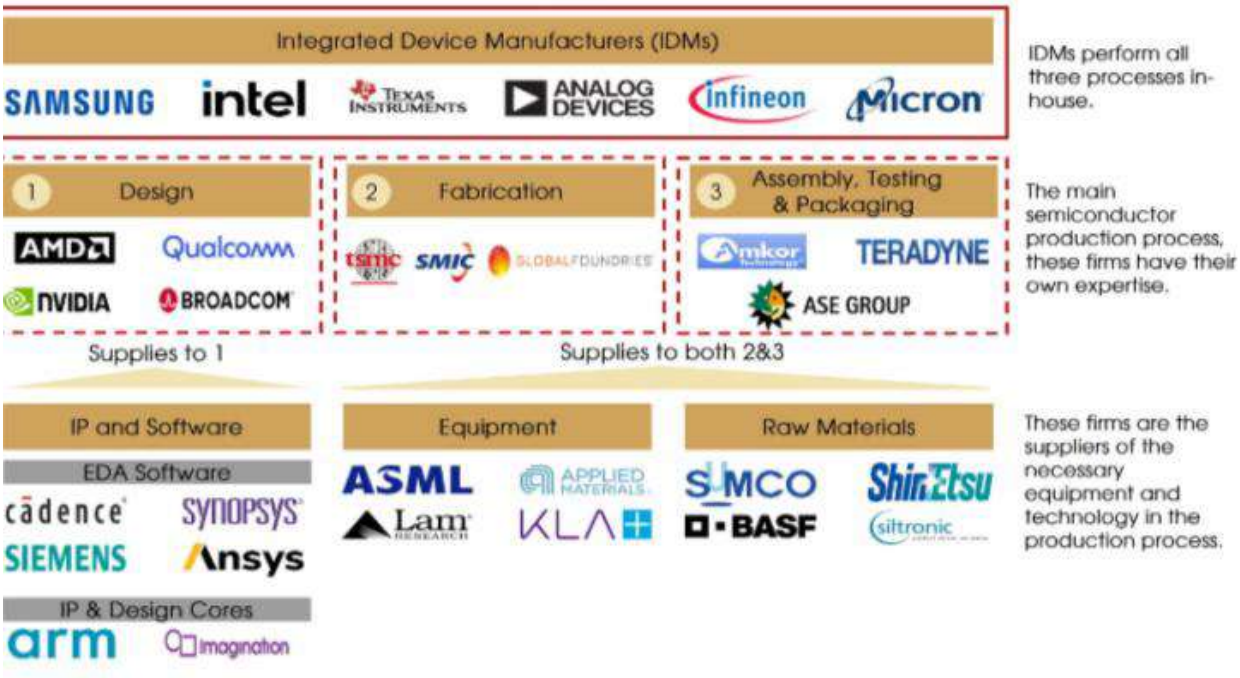
The trajectory of semiconductor leadership has exhibited notable shifts over successive decades. In the 1980s, Japanese firms held a prominent position, driving pivotal advancements. Presently, the United States has assumed a leading role, largely propelled by substantial investments in research and development, strategically favourable infrastructure, and a remarkable capacity to attract global talent.

Exhibit 8. Top 10 semiconductor companies by revenue across decades



Source: JM Financial, Industry Note: Ranking based on global semiconductor sales excluding pure-play foundries.

Exhibit 9. Who is dependent on whom in the semiconductor value chain?



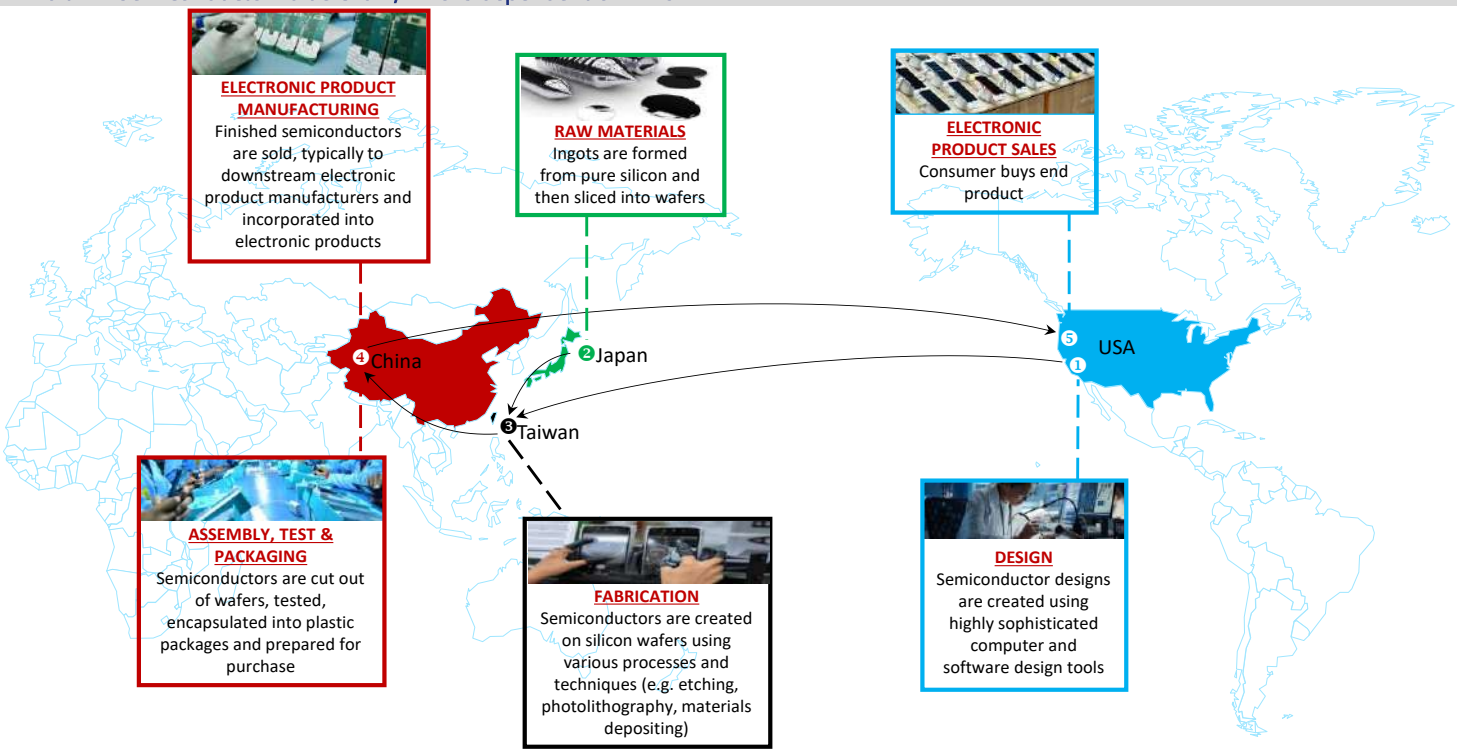
Source: JM Financial, Industry, CIGP, Semiconductor industry Association

Exhibit 10. Financial of global semiconductor players

INR Bn	Integrated Device Manufacturer (IDM)		Logic- Fabless Design		Foundries		OSAT	
Amongst leaders	Intel, USA	Micron, USA	Qualcomm, USA	Nvidia, USA	TSMC, Taiwan	UMC, Taiwan	ASE, Taiwan	PTI, Taiwan
Revenue	6,167	2,273	2,519	1584	37,919	5,034	1,306	198
GM	54.90%	44%	59%	61%	52%	26%	38%	57%
EBITDA Margin	**24%**	**30%**	**25%**	**28%**	**41%**	**16%**	**19%**	**33%**
PAT Margin	25%	27%	24%	28%	38%	15%	8%	12%
Asset T/o (x)	1.1	0.9	4.9	5.6	0.8	1.2	0.9	1
ROCE	18%	19%	39%	23%	25%	12%	6%	8%
ROE	22%	20%	84%	30%	26%	12%	16%	16%
Net Working Days	54	59	52	77	67	84	106	62
CFO	2,437	1,131	623	494	24,619	2,121	2,042	
Capex	1,517	833	123	85	16,885	991	1,666	
FCFF	920	299	500	409	7,735	1,129	375	
CFO/EBITDA (x)	1.6	1.7	1	1.1	1.6	2.6	8.2	

Source: JM Financial, Industry. Note the above numbers are Average of last 5 years; Also, the reporting period is different for most of the MNC. IDM: A semiconductor company that designs, manufactures, and sells integrated circuit (IC) products. Foundries: A semiconductor manufacturer that makes chips for other companies. Also called "fabs". Outsourced Semiconductor and Test (OSAT): Vendors that provide third-party IC-packaging and test services

Exhibit 11. Semiconductor value chain; who is dependent on whom?



Source: JM Financial, Industry

Exhibit 12. Semiconductor industry market split: By value-added activity and region, 2022

Segment	% of Total	Market Size (INR Bn)- FY22	US	Europe	China	South Korea	Japan	Taiwan	Others
EDA & Core IP	3%	1,535	1,105	307	46	23	23	31	-
Logic	29%	14,839	9,942	1,187	890	594	594	1,336	297
Memory	9%	4,605	1,289	23	23	2,671	368	184	46
DAO	16%	8,187	3,029	1,474	737	491	1,719	327	409
Total Design		**29,167**	**15,366**	**2,991**	**1,696**	**3,779**	**2,704**	**1,878**	**752**
% share of Design		**57%**	**53%**	**10%**	**6%**	**13%**	**9%**	**6%**	**3%**
Manufacturing Equipment	12%	6,140	2,579	1,289	61	184	1,658	61	307
% share of Equipment			**42%**	**21%**	**1%**	**3%**	**27%**	**1%**	**5%**
Materials	5%	2,559	256	154	486	435	358	588	281
% share of Materials			**10%**	**6%**	**19%**	**17%**	**14%**	**23%**	**11%**
Wafer Fabrication	19%	9,722	1,069	875	2,042	1,653	1,556	1,847	681
% share of Wafer Fab			**11%**	**9%**	**21%**	**17%**	**16%**	**19%**	**7%**
OSAT	7%	3,582	179	143	1,254	322	215	1,003	466
% share of OSAT			**5%**	**4%**	**35%**	**9%**	**6%**	**28%**	**13%**
Total Market (INR Bn)	**100%**	**51,170**	**19,450**	**5,453**	**5,540**	**6,374**	**6,491**	**5,378**	**2,487**
% share of Total			**38%**	**11%**	**11%**	**12%**	**13%**	**11%**	**5%**

Source: JM Financial, Industry

In IC designing, USA has the maximum market share

In IC manufacturing, all major APAC countries have equal share, with Taiwan leading the pack

In OSAT, China has maximum share

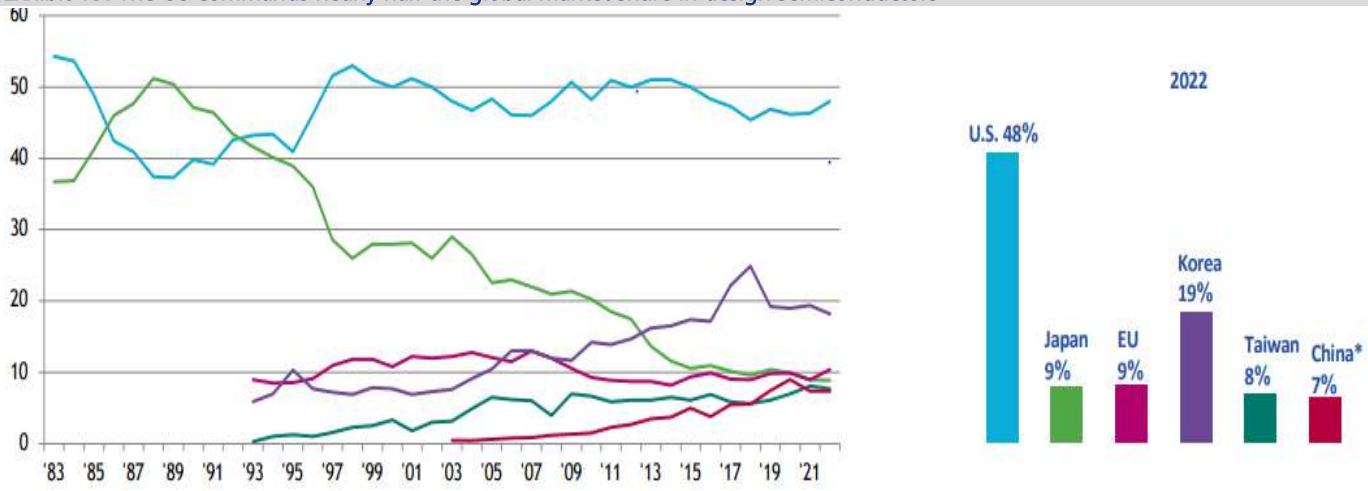
The cost of a state-of-the-art chip manufacturing facility (also known as "fab") is at least USD 20bn

US dominates the semiconductor market with high design capabilities

Design is the key activity that differentiates one semiconductor from another and guides how raw silicon wafers become state-of-the-art chips, so it's no surprise that design requires significant R&D investment. US semiconductor firms maintain a leading position in R&D, design, and process technology. Today, US-based firms have the largest global market share at 48% while other countries' firms have 7-20%. US' leading position fuels a virtuous cycle of R&D spending, which allows it to maintain its technological superiority, which, in turn, leads to higher market share and higher profit margins that encourages more R&D investment.

The U.S. semiconductor industry typically spends between 15% and 20% of its annual revenue on R&D—about USD 40bn in 2021

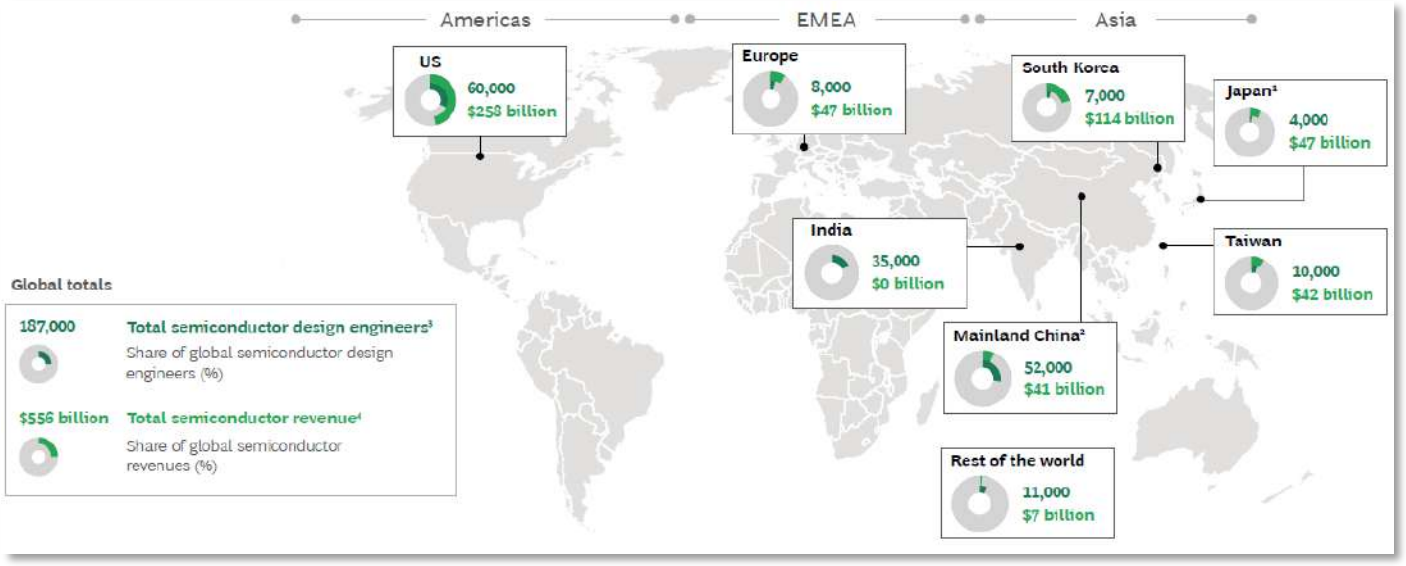
Exhibit 13. The US commands nearly half the global market share in design semiconductors



Source: JM Financial, Industry

Nearly one-third of global semiconductor design engineers are in the US, drawn by its historically strong academic programmes like STEM (science, technology, engineering, and mathematics), crucial for semiconductor design education. However, current US STEM enrolment is around 19%, while countries like China (40%), India (32%), South Korea (30%), and Western Europe (23%) have higher rates. Moreover, US university enrolment in these areas relies to a large extent on foreign nationals.

Exhibit 14. Estimated location of semiconductor design engineers from top global companies, 2021



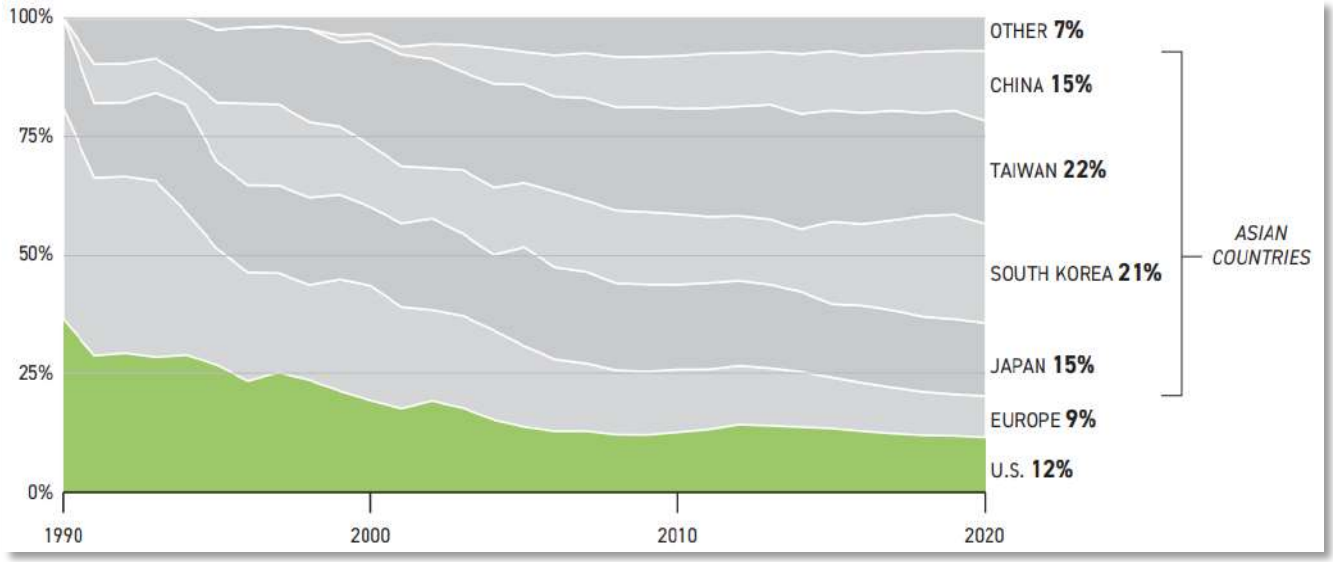
Source: JM Financial, Industry, SIA Factbook 2022, BCG. **Note**: Numbers may be underestimated due to incomplete availability of publicly available data. **Note**: [1]Japan design workers are calculated as design workers working in Japanese companies but not necessarily located in Japan.[2]Includes all members of the R&D workforce employed by local fabless companies.[3]This total excludes engineers engaged in manufacturing-related R&D.[4]Based on company HQs, as of 2021.

India possesses nearly 20% of the global design workforce, ranking third after the US and China. Despite this, its contribution to global semiconductor revenue remains limited. We expect India's potential in semiconductor design to grow significantly, driven by government incentives in the form of DLI scheme and increased capital investments by Indian companies.

US leads the global design market, but manufacturing capacity has fallen in past decades

Specifically, the US leads in research and development-intensive activities, such as chip design. But it's a different story for manufacturing. In 1990, the US' share of semiconductor manufacturing was 37%, second only to Europe. Since then, it has been outpaced by a handful of Asian countries that have been investing heavily in chip manufacturing, most notably Taiwan, China, Japan and South Korea. Both manufacturing and raw materials are now highly centralised in a handful of Asian countries.

Exhibit 15. US semiconductor manufacturing capacity share fell c.25% since 1990

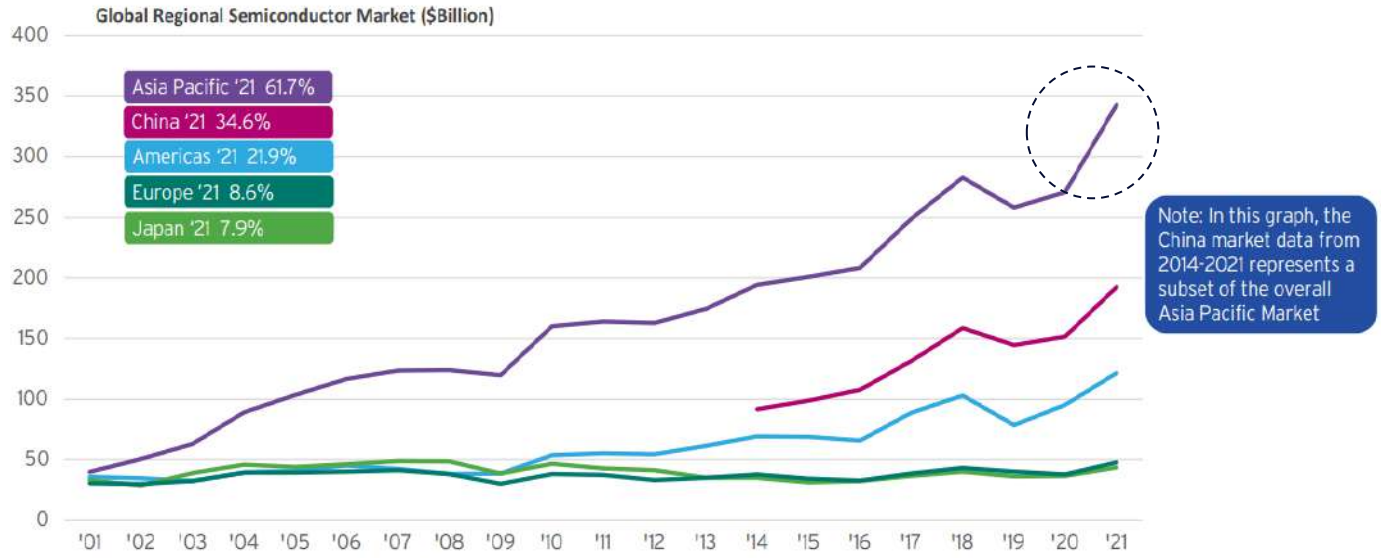


Source: JM Financial, Industry

APAC is one the largest regions in the semiconductor supply chain

In 2001, the Asia Pacific market surpassed all other regional markets in sales, as electronic equipment production shifted to the region. It has multiplied in size since then, from USD 39.8bn to over USD 330.94bn in 2022. China is, by far, the largest country market in the Asia Pacific region, accounting for 55%/31% of the Asia Pacific/ global market.

Exhibit 16. In FY21, APAC* region witnessed the highest growth of c.61.7% with China growing at 34.6%



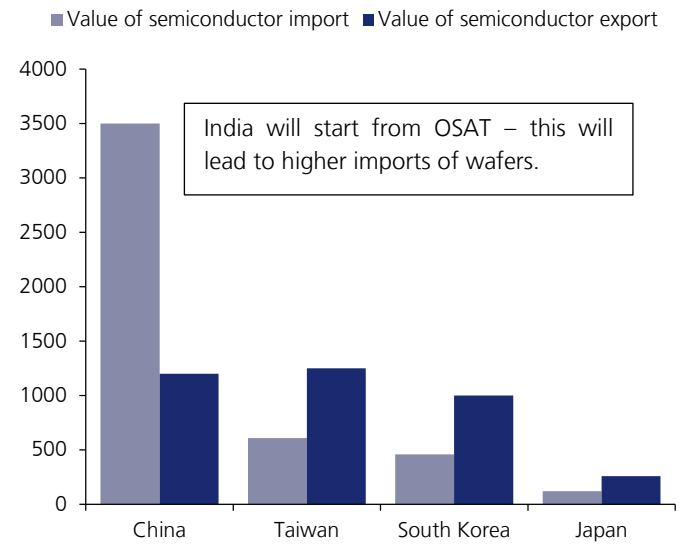
Source: JM Financial, Industry, World Semiconductor Trade Statistics (WSTS) and SIA Estimates. *APAC majorly includes China, Taiwan, Japan, S. Korea.

Note: This data reflects sales of semiconductors to electronic equipment makers only – final electronic products containing semiconductors are then shipped for consumption around the world.

A brief country-wise history of the semiconductor industry

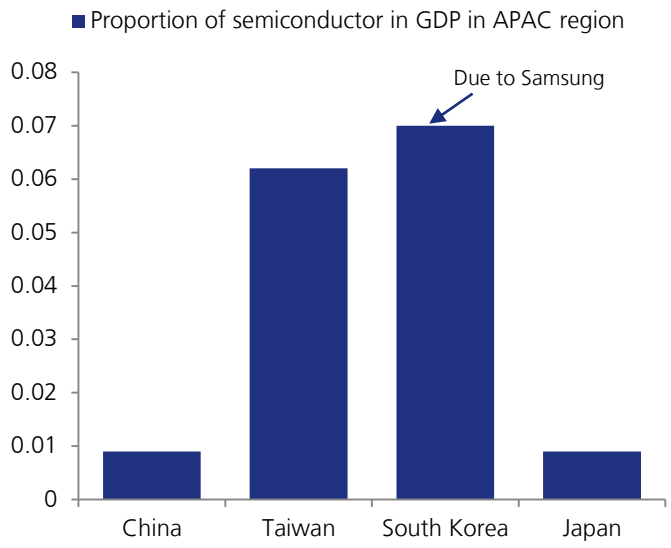
- The global semiconductor industry originated in the USA in the 1950s and later transferred to Japan in the 1970s and 1980s.
- Japan's success was supported by collaboration between corporations and research institutes, driven by the government.
- South Korea followed suit, establishing its dominance through industry support programmes and consortiums.
- Taiwan proactively introduced technology and independent R&D, leading to rapid growth in its semiconductor industry.
- Since reform and opening up in China, the country realised the importance of semiconductors, and rapidly formed an entire chain consisting of IC design, chip manufacturing and OSAT.

Exhibit 17. China has highest imports, being leading manufacturer of end-products



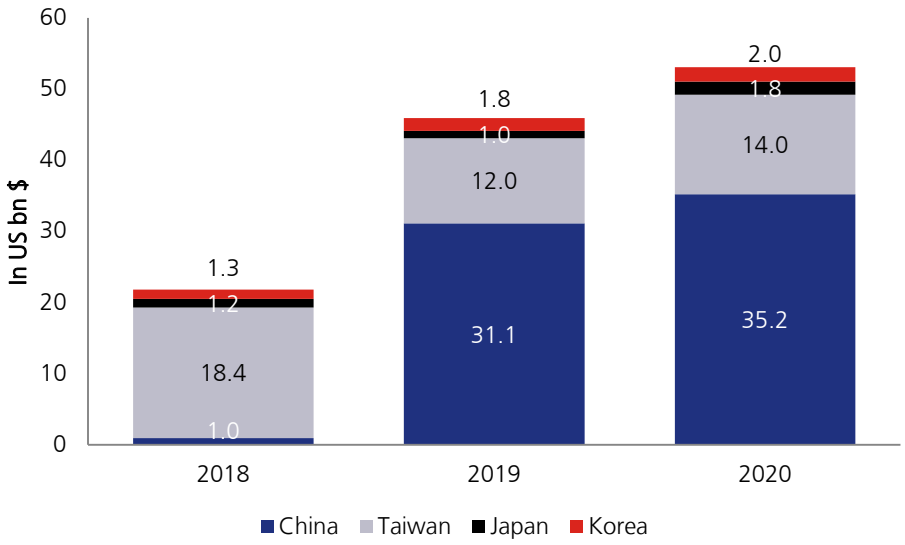
Source: JM Financial, Industry

Exhibit 18. In 2021, South Korea had the highest proportion of semi-conductors in overall GDP



Source: JM Financial, Industry

Exhibit 19. Government investment in semiconductors industry in APAC region



Source: JM Financial, Industry

Government investment/ support was a major factor that drove the success of the semiconductors industry in these four countries of the APAC region

India is now seeing increased government support, with semiconductors incentive policy of USD 10bn, making it a favoured destination for global companies

From why India to why not India? Ans: Govt's moves

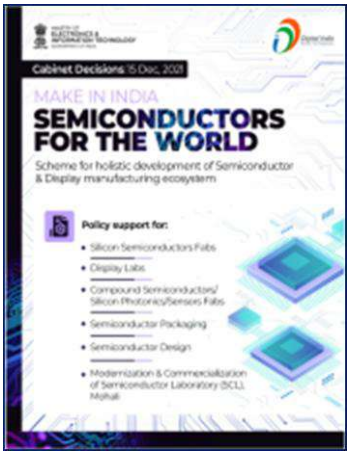
Exhibit 20. Fiscal support offered by government for electronic manufacturing in USD 30bn

Incentive outlay c.US$ 10bn	Incentive outlay US$ 7bn	Incentive outlay US$ 13bn
Support for semiconductor and display ecosystem 1. Semiconductor fabs and display fabs 2. Compound Semiconductor and ATMP 3. Design Linked Incentive (DLI) 4. Modernization of Semiconductor Laboratory (SCL)	**Support for electronics manufacturing** 1. Production Linked Incentives for mobile phones 2. Capex linked incentives for components, sub-assemblies 3. Development of electronics manufacturing clusters	**Support for allied sectors production linked incentives for** 1. Advanced chemistry cell 2. Automobiles & auto COMPONENTS 3. Telecom & networking 4. Solar PV modules 5. White goods

Source: GOI, JM Financial,

Centre's policy: Programme for development of semiconductors and a display manufacturing ecosystem in India

On 15 Dec'21, the Cabinet, led by Prime Minister Narendra Modi, approved significant revisions to the Programme for Development of Semiconductors and Display Manufacturing Ecosystem in India. Some of the key modifications are listed below.



Key modifications (Refer table on pg 11):

- Government to provide 50% fiscal support of the project cost on a pari-passu basis for all technology nodes under the Scheme for Setting up of Semiconductor Fabs in India.
- Government to extend 50% fiscal support of the project cost on a pari-passu basis under the Scheme for Setting up of Display Fabs.
- Government to offer 50% fiscal support of the capital expenditure on a pari-passu basis under the Scheme for Setting up of Compound Semiconductors / Silicon Photonics / Sensors Fab and Semiconductor ATMP (Assembly, Test, Mark, and Pack) / OSAT (Outsourced Semiconductor Assembly and Test) Facilities in India. This scheme will also include discrete semiconductor fabs.

Exhibit 21. Design linked incentive (DLI) scheme by CG

Design led Schemes	Benefit	Product/Criteria
Design infrastructure support	Reimbursement of INR 3mn per application	MPW fabrication of design and post-silicon validation activities.
Product Design Linked Incentive (P-DLI)	Reimbursement of 50% of expenditure; max INR 150mn	Design of semiconductors
Deployment Linked Incentive (DLI)	6-4% reimbursement on net sales of designed semiconductor goods over 5 years and max INR 300mn.	Revenue threshold: (1) For MSME/Startup: INR 10-50mn from year 1 to 5. (2) Other domestic companies: INR 50mn from Year 1 to 5. Incentives: Year 1/2: 6% Year 3/4: 5% Year 5: 4%

Source: JM Financial, Industry

The Ministry of Electronics and IT (MeitY) announced two additional semiconductor design start-ups – Aheesa Digital Innovations and Calligo Technologies – under the DLI scheme, bringing the total to 7 (target is 100). These start-ups will focus on making chips and IP core development for automotive, mobility, and computing sectors

Exhibit 22. Semicon India Policy framework

Category	CG	SG#	Applicant	Criteria	Application Received*
Semiconductor Fabs	50%	>20%	30%	Wafer Size: 300mm Capacity: 40K WSPM Investment > US$ 2.5bn Minimum Revenue > US$ 1bn	1. International semiconductor consortium ISMC, a JV between Abu Dhabi based Next Orbit Ventures and Israel's Tower semiconductor 2. IGSS Ventures, Singapore based 3. Tarq semiconductors, Hiranandani group company
Display Fabs	50%	>20%	30%	Technology: 8th Generation/above (for TFT LCD) or 6th generation/above (for AMOLED) Capacity (Panels/month): >=60K panels/month (For TFT LCD) or >=30k (for AMOLED)	1. Vedanta 2. Elest
Compound & Discrete Semiconductor	50%	>20%	30%	Minimum Investment: US$ 13mn Wafer Size: 150/200 mm Installed Capacity: >500 WSPM	1. SPEL semiconductor Ltd. 2. HCL technologies. 3. Valenkani Electronics 4. Ruttonsha Interantional Rectifier Ltd. 5. Micron Technologies 6. Kaynes Technologies 7. Syrma Technologies
Packaging OSAT/ATMP	50%	>20%	30%	Minimum Investment: US$ 6.5mn Technology: Flip Chip, Embedded Die, 2.5D/3D, Fan-outs, Packaging, Chiplet, SiP, etc.	8. Sahasra semiconductors Pvt. ltd.

Source: JM Financial, Industry Note: WSPM: Wafer starts per month. TFT: Thin Film transistors. *updated till July 2023 #Only those SG who have approved specific semiconductor policy

We expect OSAT will significantly benefit domestic EMS companies in terms of expansion of margins and healthy return ratios.

State-wise policy:

Gujarat Semiconductor Policy (FY22-27)

- Capital subsidy: Additional capital assistance of 40% of the capex assistance given by CG (net additional capital assistance of 20%).
- Subsidy on land procurement:
  - The government will provide 75% subsidy on the first 200 acres of land required for a fab project. Additional land would be available at 50% subsidy.
  - All eligible projects will be entitled to a one-time reimbursement of 100% stamp duty and registration fees.
- Incentive on water availability:
  - Access to portable water at a rate of INR 12 cubic meters for a period of 5 years, which would increase by 10% YoY for the subsequent 5 years.
- Incentive on power tariff and electricity duty:
  - Subsidy of INR 2 per unit for a period of 10 years

Uttar Pradesh semiconductor policy

- Capital subsidy**:** 50% additional capital subsidy on the capital subsidy approved by GOI (net additional capital assistance of 25%).
- Power subsidy: Units shall be eligible for power tariff as per industrial rates.
- Electricity duty: 100% exemption on electricity duty for a period of 20 years.
- Land rebate:
  - 75% subsidy on the first 200 acres of land on prevailing sector rates on purchasing land from state agencies. On additional purchase of land for the unit, or for ancillary units, 30% subsidy will be allowed.
  - Stamp duty and registration fees: 100% exemption on purchase/lease of land.

Odisha semiconductor policy

- Odisha hopes to establish at least one semiconductor manufacturing unit and 100 fabless design companies in the state.
- Capital sub: Additional 25% incentives for Silicon, Compound, Display & ATMP.
- Power supply: Reimbursement of INR 2 per unit for 10 years.
- Water supply: At a rate of INR 7.65 per cubic meter for 10 years.
- Land: 25% discount for mega projects.
- Other fiscal incentives: State CGSR reimbursement up to 100% of FCI.
- Interest subsidy: 5% on term loan, up to INR 250mn p.a. for 7 years.
- All other benefits admissible under Odisha IT policy 2022.

Assam Electronics (Semiconductor, etc.) Policy 2023

- Assam cabinet has approved productivity-linked incentives on 25 Aug'23 focused on attracting semiconductor fabrication and design investments.
- With this policy, Assam will soon attract investments to manufacture semiconductors in the state mainly due to clean and pure water of river Brahmaputra.

Kerala budget 2024

- Amount of INR. 100mn earmarked for OSAT project.
- Amount of INR. 140mn earmarked for the manufacture of printed circuit boards (PCB).

Exhibit 23. Timeline: Developments in India's semiconductors sector

Date	Highlights
December 15, 2021	The Indian government clears INR 850bn (>US$ 10bn) package to boost semiconductors and display manufacturing. Incentives worth INR 2.3tn (approx. US$ 30.16bn) to be available – to position India as a global hub for electronics manufacturing.
December 21, 2021	MeitY invites applications from 100 domestic companies, start-ups, and MSMEs for its Design Linked Incentive (DLI) Scheme, which aims to nurture at least 20 domestic semiconductor design companies to achieve a turnover of over INR 15bn in the next five years.
May and July 2022	International consortium ISMC (US$ 3bn investment) and Singapore-based IGSS (investment worth INR 256bn) will be setting up semiconductor plants in Karnataka and Tamil Nadu, respectively.
September, 2022	Vedanta and Foxconn, in a 60-40 joint venture, will be setting up India's first semiconductor production plant, a display fab unit, and a semiconductor assembling and testing unit.
November, 2022	Reliance Industries and leading software firm, HCL, are "independently 'evaluating' deals to purchase a 30% equity stake each in the semiconductor wafer fab applicant ISMC Analog."
March, 2023	In March, the US Commerce Secretary and India's Commerce Minister signed an MoU on establishing a semiconductor supply chain and innovation partnership.
May 10, 2023	India intends to reopen the application process for US$ 10bn worth of incentives and assistance aimed at promoting chip manufacturing.
May 16, 2023	The government is expected to green-light the Vedanta-Foxconn (VSFL) bid, but certain guarantees and information needs to be provided.
June 01, 2023	India's ambitious plans to become a competitive player in the semiconductor market face setbacks, with the proposed US$ 3bn facility by Israel and Semiconductor Manufacture Consortium stalled due to Tower Semiconductor being acquired by Intel.
June 20, 2023	Indian cabinet has given its approval to Micron's USUS$ 2.7bn investment plan to set up a semiconductor ATMP unit in Gujarat.
June 21, 2023	Prime Minister Modi has invited Micron Technology to boost semiconductor manufacturing in India during his official visit to the country.
June 22, 2023	PM Modi also met with Gary E. Dickerson, CEO, Applied Materials and invited the firm for the development of process technology and advanced packaging capabilities in India.
	Micron Technology announces plans to allocate a maximum of US$ 825mn for establishing a chip assembly and testing facility in India. The total investment, with backing from the Centre and Gujarat government, amounts to US$ 2.75bn.
June 28, 2023	Micron Technology enters into a Memorandum of Understanding (MoU) with the Gujarat government to establish a semiconductor unit worth INR 225bn (US$ 2.74bn) at Sanand, Gujarat. The facility is expected to be operational within 18 months.
July 1, 2023	UK-based SRAM & MRAM Group announces plans to establish a semiconductor fabrication facility in Odisha, with an initial investment of INR 300bn for the first phase Future plans: SRAM & MRAM Group aims to invest approximately INR 2 trillion by 2027 in expanding the semiconductor unit in Odisha.
July 3, 2023	C-DAC approves five applicants to the Design-Linked Incentive (DLI) Scheme, which is a part of the INR 760bn-budget Program for Development of Semiconductors and Display Manufacturing Ecosystem in India
July 10, 2023	Foxconn pulls out of its joint venture with Vedanta for semiconductor manufacturing and Vedanta Group acquires complete control of the joint venture with Foxconn and aims to establish semiconductor and display production facilities in Gujarat
July 12, 2023	Foxconn communicates its intention to establish four to five semiconductor fabrication lines in India and submits applications to the Indian government.
July 14, 2023	Foxconn engages in discussions with Taiwan Semiconductor Manufacturing Co (TSMC) and Japan's TMH Group to form new partnerships for semiconductor fabrication units in India.
July 19, 2023	The HCL Group considers entering the semiconductor sector and plans to present a proposal to the Indian government for establishing an assembly, testing, marking, and packaging (ATMP) unit at an estimated project cost between US$200-300 million
July 20, 2023	India and Japan formally agree to establish a joint mechanism for collaboration in the semiconductor field, covering areas such as design, manufacturing, equipment research, talent development, and supply chain resilience
	Rapidus Corporation, a semiconductor manufacturer headquartered in Tokyo, formed with the support of major Japanese companies, will be an important part of the India-Japan MoU
July 21, 2023	The Indian government approves the modernization of the Semiconductor Laboratory (SCL, Mohali) to transform it into a brownfield chip manufacturing unit.
	The Odisha Cabinet approves the Odisha Semiconductor Manufacturing & Fabless Policy to attract investors and facilitate the manufacturing of semiconductor chips in Odisha.
July 25-30, 2023	Semicon India 2023 event takes place in Gandhinagar, Gujarat, featuring leading semiconductor companies, academic institutions, and representatives from 23 countries.
July 31, 2023	Prominent industry suppliers, such as Simmtech and Air Liquide, which specialize in providing printed circuit boards and high-purity industrial gases for chip manufacturing, are currently engaged in discussions with the Indian government to initiate their operations in India.

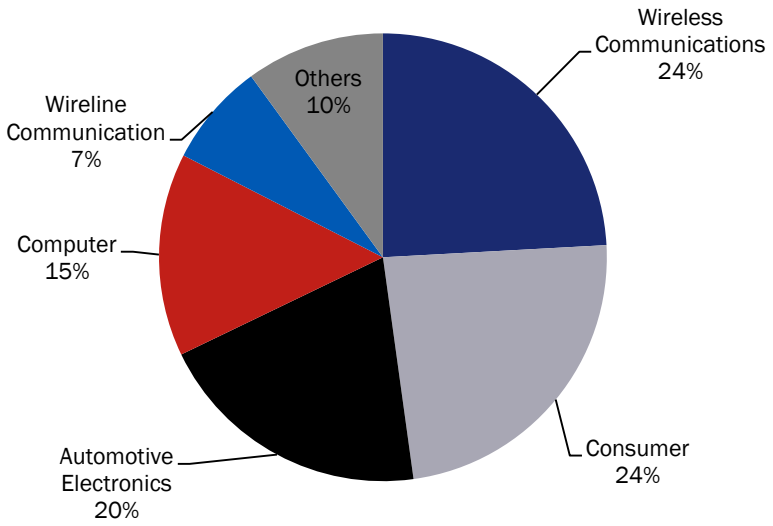
Policy announcements

Source: JM Financial, Industry

Semiconductors is a USD 110bn opportunity for India

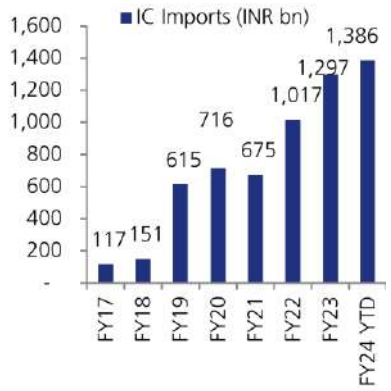
India's semiconductor industry, including software, AI, and hardware, is set to outpace global growth. The market is expected to reach USD 110bn, at a CAGR of c.22% from FY20 to FY30, contributing 10% to the global semiconductor market by FY30.

Exhibit 24. USD 110bn semiconductor market opportunity by 2030 breakup



Source: JM Financial, Industry

IC imports CAGR at c.41% over FY17-23



CAGR of imports from Taiwan/ China/ Hong-Kong/Korea/Singapore was c.40%/ 41%/ 100%/ 32%/ 39% and the share of Hong-Kong as % of overall imports increased to 22% in FY23 from just about 2% in FY17.

India's positioning in the skilled workforce required for the semiconductor ecosystem

A major hindrance in developing a semiconductor ecosystem in India is workforce upgradation. There is also a significant gap between academics and the practical knowledge that the industry needs – which needs to be reduced.

The presence of a skilled workforce is vital for semiconductors chip manufacturing, and Bengaluru has led the way by employing numerous software engineers, postgraduates, and Ph.D. holders in chip design. With the right manpower and government support, Bengaluru has the potential to expand beyond software and establish semiconductor fabrication (fab) production within India.

India boasts a strong academic foundation for the semiconductors manufacturing supply chain, but collaboration with industry leaders is crucial to align with global standards and position the country as a key player in this sector. This will require significant investment and time to qualify for the semiconductor market's requirements.

Exhibit 25. Education qualification required for semiconductors and India's status

Parameters	EDSM - Silicon CMOS	Manufacturing Technician	Semiconductor Packaging	Display FAB	Sensor FAB	Customer support	Process Improvement	Packaging & Support Engg.
Global Benchmarks	Masters or PhD in Micro Electronics	Bachelor's Degree in Electro-Mechanical	Masters or PhD in micro electronics			Master's degree, Microelectronics / Optics / Physics / Material Sciences	Machine Learning / AI design eng. MSc or PhD in ML/AI	Bachelor's Degree with basic integration knowledge
Indicator: Availability	HIGH	MED	HIGH	HIGH	LOW	LOW	HIGH	LOW
Indicator: Readiness	HIGH	MED	MED	MED	LOW	LOW	HIGH	LOW
Indicator: Maturity	HIGH	MED	MED	MED	LOW	LOW	HIGH	LOW
Remarks for India	Several institutes offer degrees and courses related to micro electronics	India is one of the largest countries with mechanical and electrical engineers	Several institutes offer degrees but no practical knowledge	Several institutes offer degrees and courses related to micro electronics	Curriculum does not have sensor FAB-related subjects	India has the relevant workforce, but it would require appropriate training	India is already a major country in these aspects and rendering its services to many western countries	India has relevant workforce that would require appropriate training

Source: JM Financial, Industry

Exhibit 26. Key players in India Semiconductor ecosystem

In Packaging, India has small like – SPEL and Chip-Test. Additionally, now Kaynes, CG power, Suchi Semicon and ASIP (Advanced System in Package Technologies) will be entering in packaging.

Source: JM Financial, Industry

Design: India's obvious strength

Almost all top design houses in the world, including Intel, Texas Instruments, Qualcomm, or Arm Ltd., have at least 30% of their global workforce in India.

India has nearly 20% of the global design workforce, ranking third after the US and China. Despite this, its contribution to global semiconductor revenue remains limited. We believe India's potential in semiconductor design is set to grow significantly, driven by government incentives in the form of Design-Linked Incentive (DLI) Scheme and increased capital investments by Indian companies.

India's design capabilities are on par with some of the best players in the field, including those in the San Francisco Bay Area. It comfortably leads the pack in both semiconductor design and embedded system software

Semiconductor manufacturing is an unpenetrated sector in India

To foster manufacturing in semiconductor components, there are two streams that India needs to focus on – silicon-based technologies, which constitute about 80%/90% of the semiconductors manufactured today, and evolving compound semiconductor technologies like Gallium Arsenide, Gallium Nitride, Silicon Carbide, etc.

There is no state-of-the-art fab for high-end, commercial semiconductors in India. As a result, successive Indian governments have been attempting to incentivise companies into setting up fab units within the country

At present, there are three fabrication units in the country:

(1) Semiconductor Complex Limited (SCL) in Chandigarh works on silicon technologies.
(2) Silicon Technology and Applied Research Centre (STAR-C) in Bengaluru houses fabrication facilities for micro electromechanical systems (MEMS).
(3) Gallium Arsenide Enabling Technology Centre (GATEC) in Hyderabad focuses on compound semiconductor devices as well as related technologies and research.

SCL is equipped to fabricate 180nm CMOS process on a 6-inch and 8-inch wafer. It also has packaging and testing capability

SITAR has a 6-inch wafer processing capacity, but the technology node is not advanced

However, these facilities mainly cater to the requirements of the Indian Space Research Organisation (ISRO) and the Defence Research Development Organisation (DRDO).

Apart from establishing a fabless ecosystem, the next low-hanging fruit for India would be an OSAT/ATMP facility. Although countries like Malaysia and Philippines have already taken the lead in this sector, there are critical opportunities that India can still tap.

"As a result, its design ecosystem can complement Taiwan's strengths in manufacturing, effectively creating a global powerhouse. As a simple first step, both sides can examine the possibility of cooperating in OSAT/ATMP businesses. In this regard, the IESA will work assiduously with the Government of India to ensure an enabling policy environment."

Krishna Moorthy,

Ex-President of the India Electronics and Semiconductor Association (IESA)

Apart from infrastructural requirements like electricity, water supply and land, skilled manpower is essential to the semiconductor industry

By improving on these aspects, India can convince semiconductor industries in Taiwan, the U.S., South Korea etc., to diversify their investments in the country

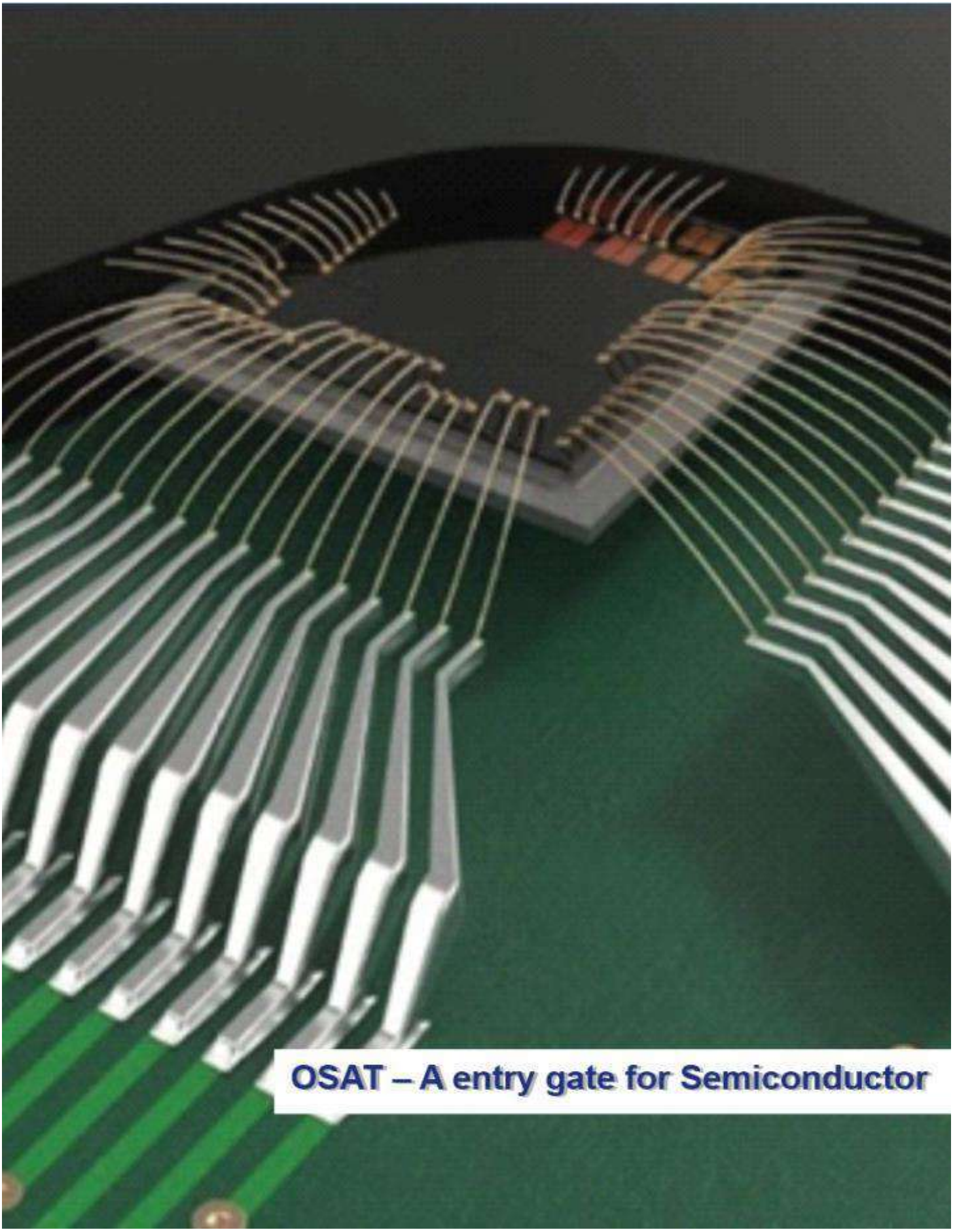
As per Government sources, the potential Taiwanese players for collaboration are:

•Semi fab: Powerchip, TSMC, UMC, VIC

•Display fab: AU Optronics, Innolux, Hannstar

•Packaging: ASE Technology

•Compound semiconductors: WIN Semiconductors, AWSC


OSAT – A entry gate for Semiconductor

India's OSAT opportunity – INR 1,000bn by 2030

In FY20, India's OSAT revenue from the three companies (Tessolve Semiconductor Pvt. Ltd., SPEL Semiconductor Ltd – a listed company, Continental Device India Ltd – CDIL Pvt. Ltd.) was c.INR 7bn; including other companies such as Chiptest Engineering Pvt. Ltd. and Semi-Conductor Lab (SCL) it would be c.INR 8bn (JM estimate). This INR 8bn represents a value addition of c.0.7% of the total India semiconductor market value of INR 1,125bn (USD 15bn) in FY20.

We expect OSAT value addition to increase above global standards (c.7%) to 12-15% by 2030 as India will initially focus on low hanging opportunity of OSAT and which will be followed by designing. This can lead to the India OSAT opportunity of c.INR 1000bn (USD 110bn * 12% * 75 (exchange rate)**) from INR 8bn in FY20.**

The OSAT market in India has not yet taken off due to the costs involved in importing wafers that are fabricated abroad. However, government incentives mentioned below to subsidise cost are showing good early results.

Exhibit 27. Semicon India policy framework

Category	CG	SG#	Applicant	Criteria	Application Received*
Packaging OSAT/ATMP	50%	>20%	30%	**Minimum Investment: US$ 6.5mn** Technology: Flip Chip, Embedded Die, 2.5D/3D, Fan-outs, Packaging, Chiplet, SiP, etc.	1. SPEL semiconductor Ltd. 2. HCL technologies. 3. Valenkani Electronics 4. Ruttonsha Interantional Rectifier Ltd. 5. Micron Technologies 6. Kaynes Technologies 7. Syrma Technologies 8. Sahasra semiconductors Pvt. ltd.

Source: JM Financial, Industry, GoI, *updated till July 2023 #Only those SG who have approved specific semiconductor policy

OSAT growth drivers for India

- Low-cost labour availability: The OSAT model is a labour-intensive, high-volume, and low-margin business. India has sufficient labour availability (people with a Diploma/ B.Tech in EE / Mechanical & Electronics).
- Government incentives: Mentioned in Semicon India Policy Framework table on this page.
- Global tailwinds: The ATMP arena is dependent on a very few players (mostly in China and Taiwan). Amidst geopolitical tensions between the US and China, fabless companies and integrated device manufacturers are looking to diversify their ATMP partners.
- High middle-class consumption: India is a large consumption market for electronics, industrial automation, and automotive segments.

OSAT announcements in India

- Tata Electronics applied for setting up OSAT worth INR 400bn in Assam.
- Kaynes Tech chose Telangana for INR 28bn semiconductor OSAT facility.
- HCL group is moving closer to setting up USD 400mn OSAT facility in Karnataka.
- CG Power sought a nod for USD 791mn OSAT facility in India.
- Noida-based Sahasra Electronics invested INR 3.5bn on a semiconductor packaging unit. It will invest INR 6bn over 5-6 years. Till now, it has invested c.INR 1.1bn to start the first phase of assembly and packaging of chips. In the next 4-5 years, it is targeting INR 5bn revenue from the semiconductor business.
- CDIL Semiconductors to add new assembly lines, to increase its capacity by 100mn units.
- Micron to invest USD 2.75bn in setting up a semiconductor testing facility in Gujarat's Sanand.
- SPEL will incur INR 1.1bn in two phases (INR 550mn in each phase) towards expansion of capacity of its package portfolio

Indian OSAT company briefs

SCL

- SCL is an autonomous body under Ministry of Electronics & Information Technology (MeitY), Government of India; it is engaged in R&D in microelectronics, to meet India's strategic needs.
- Formerly known as Semiconductor Complex Limited, a Government of India Enterprise, it was converted into a semiconductor Laboratory under the Department of Space from 1 Sep'06. SCL has integrated facilities and supporting infrastructure all under one roof; it undertakes activities focused on design, development, fabrication, assembly & packaging, testing and quality assurance of CMOS and MEMS devices for various applications.

SPEL Semiconductor Ltd

- SPEL is India's first Semiconductor IC Assembly & Test facility. It pioneered the OSAT market in India and continues to steadily do so. It is a trusted and strategic contract manufacturing partner for many of the world's leading semiconductor companies.
- Incorporated in 1984, it is based in Chennai, Tamil Nadu. It initially supplied to the domestic market but soon acquired the expertise to serve the global market. SPEL's customers are some of the biggest Integrated Device Manufacturers (IDMs) and fabless companies in the United States and Asia.
- SPEL offers packaging technology for semiconductors used in diverse end-market applications including communications, consumer electronics and computing. It provides full turnkey solutions that include wafer sort, assembly, test and drop-shipment services, which help customers accelerate time-to-revenue for their new products. SPEL also offers value-added services such as package design, failure analysis and full

Continental Device India Pvt. Ltd

- Pioneered the manufacturing of Silicon Semiconductor Chips and Devices in India in 1964. It launched its Electronic Manufacturing Services (EMS) division (Deltron) in 1982.
- Manufacturing semiconductors for over 50 years. It has created a name for CDIL in India and is a brand that is recognised globally.
- It offers a range of semiconductor chips and devices that include diffused wafers, transistors, diodes, rectifiers, thyristors and regulators, with specialties in the metal can and custom designed packages.

Tessolve Semiconductor Pvt. Ltd

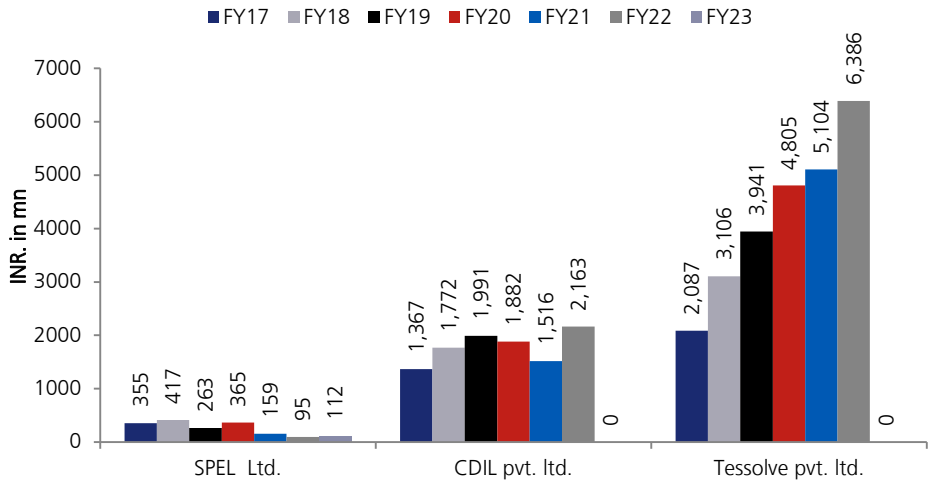
- TSPL was incorporated in 1993 and is based in Bengaluru, Karnataka, with additional offices in Chennai, Noida, Hyderabad, Singapore, USA, Malaysia, Germany, China, UK and Japan. It operates as a subsidiary of Hero Electronix Pvt. Ltd and is engaged in the manufacture and supply of semiconductor products. It also provides semiconductor testing and product-engineering-related services.
- The company offers products such as ate board design, magik-2 modules, connectivity modules, sensor controllers, gateways, IoT backend, etc. It also offers services such as test engineering, radio frequency, board design, wireless technology, training, cloud development, system design.
- It caters to industries such as industrial, avionics, automotive, fintech, medical, etc.

Chiptest Engineering Pvt Ltd

- Chiptest Engineering Private Limited is a Chennai-based company incorporated on 5 Feb'01. It is involved in semiconductor IC test engineering & hardware products with associated embedded solutions for global customers.

Financials of Indian OSAT companies

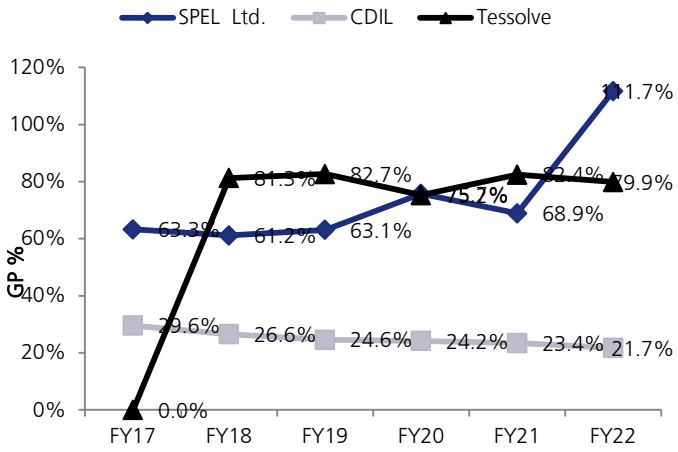
Exhibit 28. Revenue: Tessolve has grown significantly vs. others; SPEL saw negative CAGR due to the pandemic, but its revenue grew 18% YoY in FY23



SPEL is a pure OSAT player while CDIL is mainly into manufacturing silicon semiconductor chips; Tessolve is mainly into providing design services

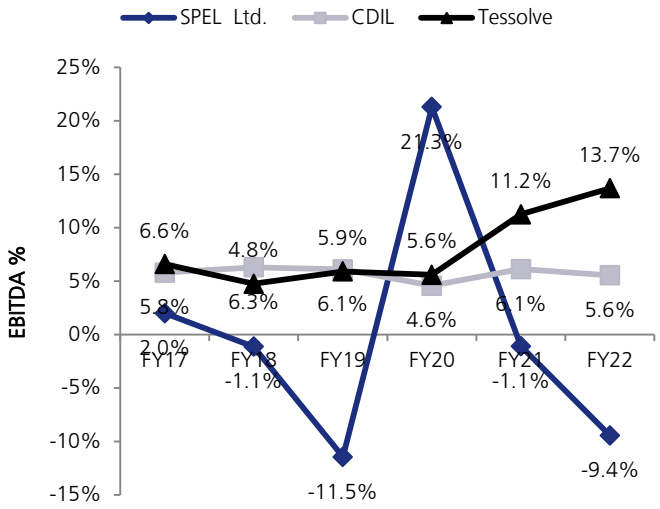
Source: Industry, JM Financial, Industry

Exhibit 29. Gross Profit



Source: JM Financial, Industry

Exhibit 30. EBITDA Margin



Source: JM Financial, Industry

Variability can be seen across companies. Inventory gain was observed for SPEL in FY23 though historically margins have been 60-70%

Tessolve's EBITDA margin has been improving since FY19 and is now the highest at c.14%

CDIL margins have historically been in the mid-single-digit range

A lot of variation in SPEL's margins

Industry insights from expert meetings

Semiconductor Industry:

- → According to SEMI's director, India is at an advantage because it is a massive consumption market, there is strong government support, and wages are relatively low.
- → The Indian government is considering 10 applications by chipmakers under a USD 10bn capex-linked incentive scheme, with two of the proposals being for silicon fabs, three for compound semiconductor fabs, and five for packaging chips.
- → NXP Semiconductor is in talks with the government to establish a fab in India.
- → India's chemical industry lacks the capability to produce the specialised ultra-high-purity chemicals that the semiconductors industry needs. The Indian government has asked IESA (India Electronics and Semiconductor Association) to form a task force to ensure chemical companies adhere to stringent purification criteria and secure storage requirements necessary for semiconductor manufacturing. Approximately 15-16 Japanese companies have already partnered with IESA to provide the necessary technology.

OSAT:

- → Current bottlenecks for OSAT: Extensive paperwork can lead to time-consuming delays of up to 2 years.
- → OSAT costs vary depending on the size of the IC (Integrated Circuit).
- → Establishing a comprehensive OSAT assembly line requires an investment of USD 100mn-120mn.
- → OSAT operations are characterised by low labour intensity.
- → Following OSAT by Malaysian/Philippines companies, packaged ICs and other components are generally transported to distribution centres (which act as a market for all different components) in Singapore/Hong Kong.
- → Micron's OSAT facility primarily focuses on memory chips, which find extensive applications in gaming and mobile technologies, and will primarily serve captive demand.
- → Packaging for other types of chips is similar to memory chips, allowing India to expand its expertise beyond memory chips.
- → As per Mr Ved Prakash, director IESA, engaging in OSAT operations makes strategic sense for EMS companies.
- → It is better for foundries to outsource OSAT due to cost and quality efficiency.
- → HCL Tech is planning to get into high-end OSAT assembly. The application has been approved by CG for 50% subsidy.
- → For China +1, India is generally preferred over other Asian countries due to its cost advantage and availability of natural resources.
- → Finding a renowned technological partner is one of the biggest barriers for people entering into the semiconductor ecosystem.
- → A technology partner should either be the provider of equipment or an established OSAT player.
- → A good technology partner should have: (1) production-ready technology, (2) skin in the game, and (3) continuous support from the technology partner.
- → A complex OSAT facility will take 18-24 months to start production. After this, if everything goes well, it will take another 3 years to reach 90% utilisation.
- → Though OSAT comes after wafer manufacturing (foundries) stage in the value chain, customers for OSAT in most cases are fabless companies, not foundries. Therefore, it's the fabless companies that command the complete flow of chips.

Global OSAT market size at INR 3.58tn in 2022

Asia-Pacific dominates the Outsourced Semiconductor Assembly and Test Services (OSAT) market with nearly 90%+ share. The region has emerged as a key hub for semiconductor manufacturing, driven by factors such as cost advantages, a skilled workforce, a strong supply-chain ecosystem, and extensive government support. As a result, countries like Taiwan, China, and South Korea have successfully been able to attract major OSAT players in the semiconductor industry.

OSAT companies offer third-party IC packaging to silicon devices that are made by foundries and test services; their customers are generally fabless companies

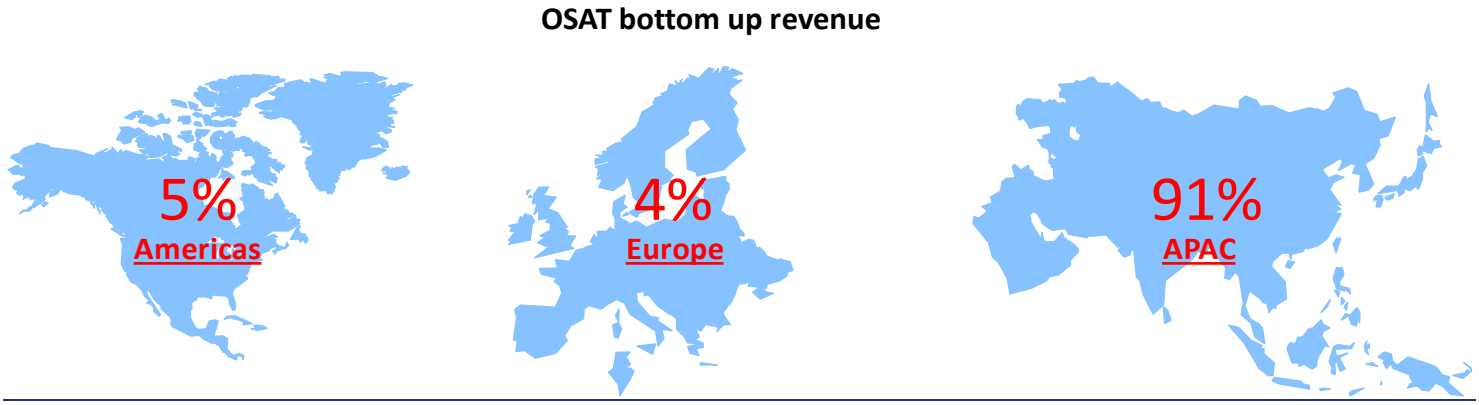
OSAT companies, integrated device manufacturer (IDMs), and foundries use materials and equipment to assemble and package finished wafers

Exhibit 31. Assembly, testing, marking, and packaging: Sectors, market size, and leading firms

Sector	2019 market size	Select leading firms (Headquarters)
OSAT	US$ 16bn	ASE (Taiwan), Amkor (USA), JCET (China), Powertech (Taiwan), TongFu (China), Tianshui (China), UTAC (Singapore), etc.
In-house ATPM (by foundries and IDMs)	US$ 14bn	Intel (USA), Samsung (USA), S.K. Hynix (South Korea), Micron (USA), TSMC (Taiwan), etc.

Source: JM Financial, Industry Estimate, Khan, Mann, and Peterson, "The Semiconductor Supply Chain"

Exhibit 32. Most packaging, test, and assembly houses are in lower-cost locations, including China, Taiwan, Malaysia and Vietnam



Source: JM Financial, Industry

Growth drivers for OSAT

- → Demand for semiconductor chips has increased in industries such as consumer electronics, aerospace, defence, automotive, and healthcare. For instance, in North America, growth is led by aerospace players like SpaceX and Boeing, which use semiconductors in a wide range of applications such as missile guidance systems, radar, satellite communication, etc.
- → Increasing wafer fabrication facilities – as per SEMI's World Fab Forecast Report, 92 fabs will begin operation between Jan'22 and Dec'24 and construction of 93 fabs will start in the same period (explained in detail on page 13/14).
- → Significant electrification in emerging markets, such as Vietnam and India.
- → Increasingly complexity of chips, such as the use of silica carbide semiconductors, which are known for less power loss compared to traditional silicon semiconductors. For instance, in Apr'23, Denso Corporation launched silica carbide power semiconductors in the new Lexus RZ electric vehicles inverter.
- → Innovation and development of new products. For instance, in Jun'22, UTAC holdings*, Taiwan, launched a new low-cost-generation test system for image sensors.

*In Jan'21, Sigurd microelectronics acquired UTAC Taiwan for USD 165mn, a move that boosted its manufacturing output by 40-50% and increased annual sales by USD 73.3mn.

As per Mordor intelligence, OSAT market will see a CAGR of 8% over FY23-28 to reach c.INR 5.28trln (USD 64bn)

OSAT process flow: A low value-add to the supply chain

- Semiconductor assembly and test process involves wafer cutting, mounting onto substrates, wire bonding or conductive resin connection, sealing, and additional operations like post-mould cure, trim & form, plating, and printing.
- After packaging, the product undergoes testing before being warehoused for shipment.
- Semiconductor devices come in various package forms: Pin insertion, surface mount, and advanced packages like DIP, SOP, QFP, BGA, CSP, and SIP*, each with advanced technical features.
- Over time, packaging has seen three major innovations: (1) Transitioning from pin-in packages to surface-mount packages in the 1980s, (2) adopting ball matrix packages in the 1990s for higher pins and improved device performance, and (3) focusing on chip-level and system packages to minimise packaging area.

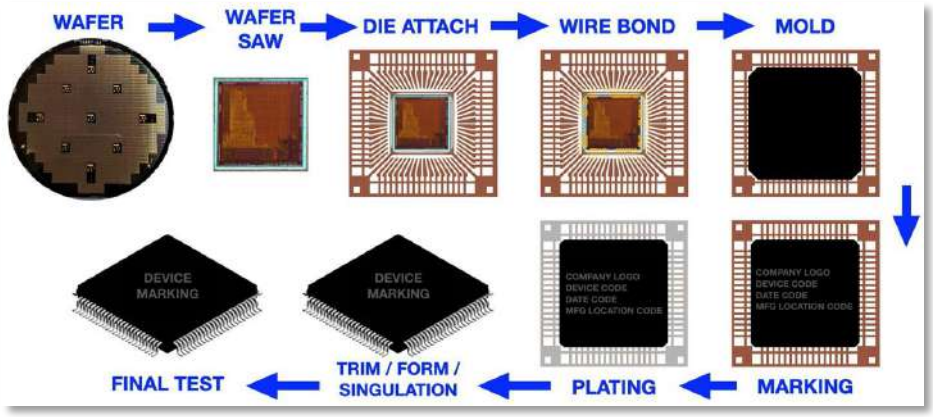
*Dual Inline Package (DIP), Small Outline Package (SOP), Quad Flat Package (QFP), and Ball Grid Array (BGA), Chip Scale Package (CSP), Single in-line package (SIP).

Exhibit 33. Package type relation end market application

Sr. No.	Package Type	Semiconductor Devices	End-market Application
1	Leadframe-based (includes QFN and SON)	Analog, discrete, power, general purpose logic, mixed signal devices, microcontrollers and memory	Computers and peripherals, memory cards, communication devices, mobile phones, tablets, games, automotive, industrial, and consumer/toy application
2	Chip Scale Packages	Digital signal processors, analog, memory, microcontroller, gate array, radio frequency, sensors, and power devices	Mobile phones, tablets, laptop gamming consoles, automotive, memory card, and other wireless, telecommunication devices
3	Ball Grid Array	High-end gate arrays, microprocessors, digital signal processors, graphics processors, chipsets, and other advanced logic, radio frequency, and advanced memory products	Computers and peripherals, telecom and network systems, automotive, gaming consoles, set top boxes, industrial, and military and aerospace
4	Flip Chip Packaging	High-end logic such as MPU, CPU/GPU, ASIC,FBGA, DSP, baseband and application processors for wireless products, radio frequency, mixed signal, analog and sensors	Personal computers, tablets, mobile phones, high-performance servers and networking systems, gaming consoles, automobiles, and military and aerospace
5	Wafer Level Packaging	Audio codec, power management IC, processors, antenna controller, RF, wireless connectivity, LED drivers, and sensors	Laptops, mobile phones, tablets, watches, games and wearables

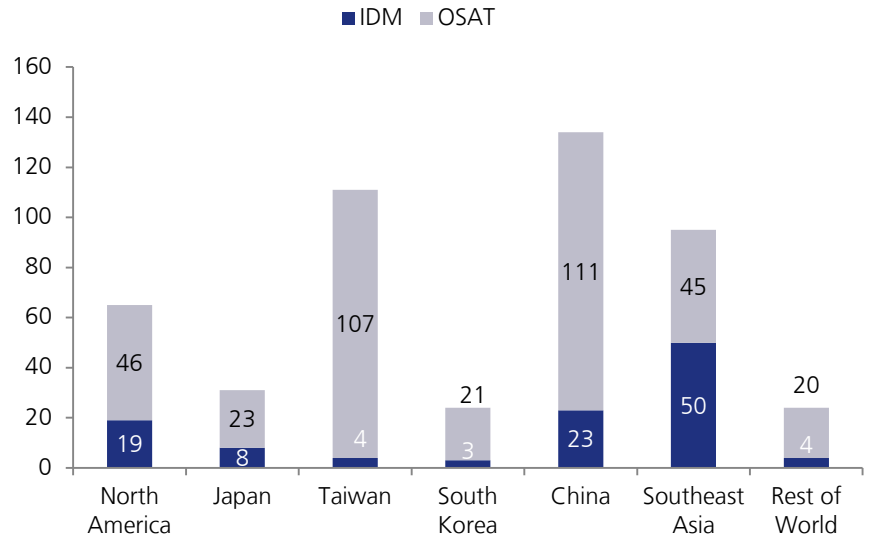
Source: JM Financial, Industry

Exhibit 34. Basic assembly process flow



Source: JM Financial, Industry

Exhibit 35. Total no. of ATMP/OSAT facilities counted by SEMI in 2021: 484



Source: JM Financial, Industry, Worldwide assembly and test facility database.

Today, the vast majority of ATMP facilities (about 87%) exist in Indo Pacific countries, with a heavy concentration of OSAT providers in Taiwan, China, and South-east Asia (particularly in Singapore, Malaysia, Vietnam and Philippines). Out of the 484 facilities counted by research firm SEMI in 2021, 134 or 28% were in China

Increased fab capex…

The global semiconductor industry is likely to enhance its overall output capacity to an unprecedented level ahead. SEMI expects 127 out of the total 1,470 wafer fabs to upgrade, and 93 new ones to begin construction between Jan'22 and Dec'24, in order to meet accelerating global demand. The five largest players are expected to incur capital expenditure exceeding USD 600bn by 2030.

Exhibit 36. Major semiconductor companies increase investments to address rapid growth in demand

Semiconductor companies	Planned Investments (in US$ bn)	Rationale	Duration/ Start
Intel	85	· Intel's IDM 2.0 strategy aims to create a next-generation European chip ecosystem and address the need for a more balanced and resilient supply chain. · The company plans to become a major provider of US and EU based foundry capacity in order to meet surging global demand for semiconductors.	Over the next decade
Samsung	205	· Samsung intends to expand its foundry production capacity by 3x by 2026 amid global chip shortage. It would expand its production lines in Pyeongtaek, Seoul, and build a new factory in the US. · A part of the US$ 205bn would be used for semiconductor expansion.	Through 2026
TSMC	100	· TSMC plans to invest US$ 100bn for increasing its manufacturing capacity in its plants in order to meeting the growing need of semiconductors over the next three years.	2026
Micron	150	· Aims to build cutting-edge memory manufacturing technology and R&D over the next 10 years. The investment would also include fab expansion in the US.	Over the next decade
SK Hynix	106	· SK Hynix plans to construct a 4.15mn sq. m. industrial cluster that would accommodate four new semiconductor fab plants and scale up the production capacity.	2026

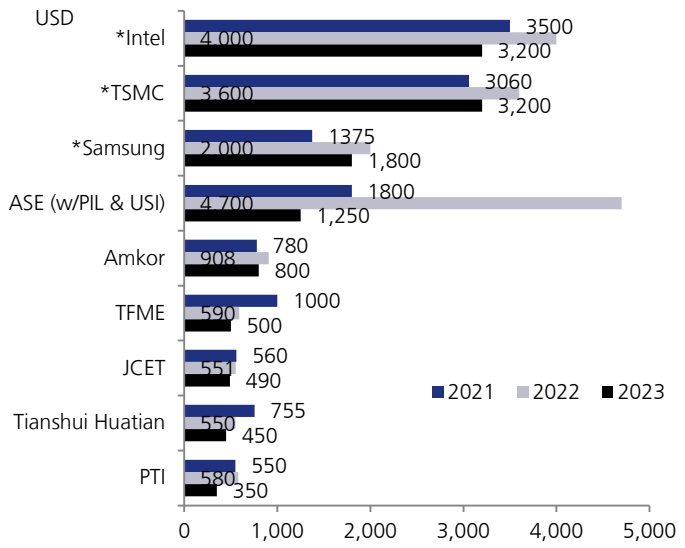
Source: JM Financial, Industry Estimate, Aranca

…leading to higher advanced chip packaging demand

Output capacity investments are leading to increased demand for advanced chip packaging; leading chipmakers and OSAT companies have spent around USD 14.5bn on advanced packaging fabs and tools in 2022. In 2023, Intel announced a USD 4bn investment, leading the market, followed by TSMC (USD 3.6bn), Samsung Foundry (USD 2bn), and ASE Group (USD 1.7bn). Even when their advanced packaging capex budgets are expected to shrink to USD 11.9bn due to a chip market downturn, the sums are massive!

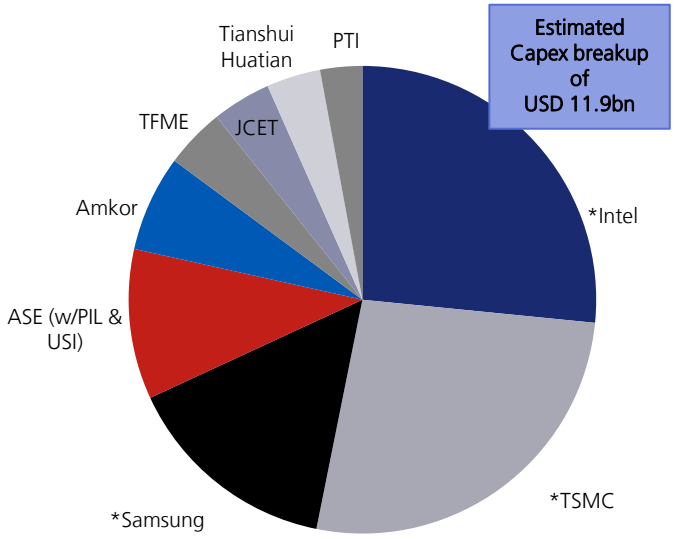
For details on advance chip packing refer annexure 1

Exhibit 37. Estimated 2021-23 packaging capex by top players (USD mn)



Source: JM Financial, I Industry Yole Intelligence *TSMC, Intel and Samsung's packaging capex were estimated based on earning statements and announcements of investment since packaging is not their primary business focus. All capex data is estimated based on information gathered during Q1 CY23

Exhibit 38. Estimated 2023 packaging capex split



Source: JM Financial, Industry Industry Yole Intelligence *TSMC, Intel and Samsung's packaging capex were estimated based on earning statements and announcements of investment since packaging is not their primary business focus. All capex data is estimated based on information gathered during Q1 CY23

With the exception of a few like ASE Group, most OSAT players might hesitate to offer advanced packaging services due to the substantial investments and risks involved. Chipmakers should provide additional technical support and profit incentives to encourage greater engagement from OSATs in advanced packaging.

Current outlook for the OSAT market

In 2023, the semiconductor industry grappled with destocking due to reduced demand in consumer electronics and non-AI cloud servers. OSAT plant capacity utilisation ranged from 50-65% in H1, which should recover to 60-75% in H2. The overall semiconductor OSAT market is estimated to decline by 13% YoY in 2023, but should recover in 2024, driven by the gradual rebound of the semiconductor sector and increased focus on advanced packaging and heterogeneous integration (assembly of various semiconductor components, such as chips of different technologies or functionalities, onto a single package to enhance overall system performance and functionality).

Financials of global OSAT companies

Among the worldwide top-10 OSAT vendors, 9 are located in the Asia/Pacific region; there are 6 in Taiwan, 3 in China, and 1 in the United States, with a total market share of 88% in 2020. Vendors in Taiwan include ASE, PTI, KYEC, Chipbond, ChipMOS, and Sigurd; vendors in China include JCET, TFME, and HuaTian. The US vendors are represented by Amkor.

For details on global OSAT companies – refer to Annexure 2

Exhibit 39. Top-10 global OSAT companies in 2020

Rank	Company	Area	2019 (INR in bn)	2020 (INR in bn)	Annual Growth %	Market Share 2019	Market Share 2020
1	ASE	Taiwan	941.7	1200.6	27.50%	37.50%	42.84%
2	Amkor	USA	285.3	374.3	31.20%	11.36%	13.36%
3	JCET	China	239.8	284.6	18.67%	9.55%	10.15%
4	PTI	Taiwan	151.6	191.8	26.47%	6.04%	6.84%
5	TFME	China	84.3	115.8	37.43%	3.36%	4.13%
6	HUATIAN	China	82.6	90.1	9.12%	3.29%	3.22%
7	KYEC	Taiwan	58.2	72.9	25.23%	2.32%	2.60%
8	ChipMOS	Taiwan	46.4	57.9	24.96%	1.85%	2.07%
9	Chipbond	Taiwan	46.5	56.1	20.48%	1.85%	2.00%
10	Sigurd	Taiwan	22.9	31.3		0.91%	1.12%
Top ten total			**1959.26**	**2475.34**	**26.34%**	**78.03%**	**88.33%**
Other			551.64	327.11	-40.70%	21.97%	11.67%
Total			**2510.9**	**2802.45**	**11.61%**	**100.00%**	**100.00%**

Source: JM Financial, Industry Company data. All company figures are converted to INR. Total OSAT market is estimated by applying a constant 7% value addition to the global semiconductor market estimated by Taiwan industry report. Some of these companies are also engaged in other value-added activities apart from OSAT. ASE - Advanced Semiconductor Engineering; JCET - Jiangsu Changjiang Electronics Technology Co. Ltd; PTI - Powertech Technology Inc; TFME - Tongfu Microelectronics Co; KYEC - King Yuan Electronics Co. Ltd; HuaTian – Tianshui Huatian Technology.

Summary of P/L for all global OSAT companies

The overall revenue of OSAT companies in 2020 grew 12% YoY, among which the revenue of the top-10 grew 26%. These top-10 companies gained enormous market share to c.88% in 2020 from c.78% in 2019

- → **Revenue:** Apart from a few Malaysian companies (Globetronic and KESM), five-year revenue CAGR has been positive for all geographies, including China, Taiwan, and South Korea. Chinese company Tonfu saw the highest revenue CAGR of c.32%, as AMD, a major IC design manufacturer, started business with Tonfu. LB Semicon of South Korea saw 33% CAGR, but on a relatively small base.
- → **Contribution margins:** No pattern could be deduced due to high variability in all countries. However in Taiwan, we saw two clear types – one enjoying higher margins of 25-30% while the other had slightly lower ones of 18-22%.
- → **Operating margins:** Again, no pattern emerged due to high variability in all countries. In China, JCET enjoyed the highest margins of 18%+, in Taiwan, Chipbond had 22%+; in Malaysia, Globletronic and Inari had 22%+; and in South Korea, Hana Micron had 8%+. USA's Amkor saw operating profit CAGR of c.22% over CY17-22.
- → **PAT margins:** Most companies across the globe make mid-to-high-single-digit PAT margins; however, a few companies in Taiwan such as Chipbond, Sigurd, and KYEC made higher margins of 10-15%. In Malaysian markets, double-digit margins have sustained historically. USA's Amkor is seeing a steady rise in margins to 11% in CY22 from c. 3% in CY17.
- → **RoE and RoCE:** In general, returns have been better for Taiwan and USA companies. Barring a few, Malaysian companies saw decreasing returns in CY22 vs. CY17. Returns increased steadily for South Korean companies, but varied quite a bit for Chinese ones.
- → **Asset turns:** Unsurprisingly, globally, OSAT companies have asset turns below 1x, with Amkor (USA) being the only company to cross 1x in CY20, and able to sustain it in CY22. Although unevenness was visible across geographies, asset turn for Chinese and Taiwanese companies moved in sync over CY17-22.

China – a global OSAT market leader

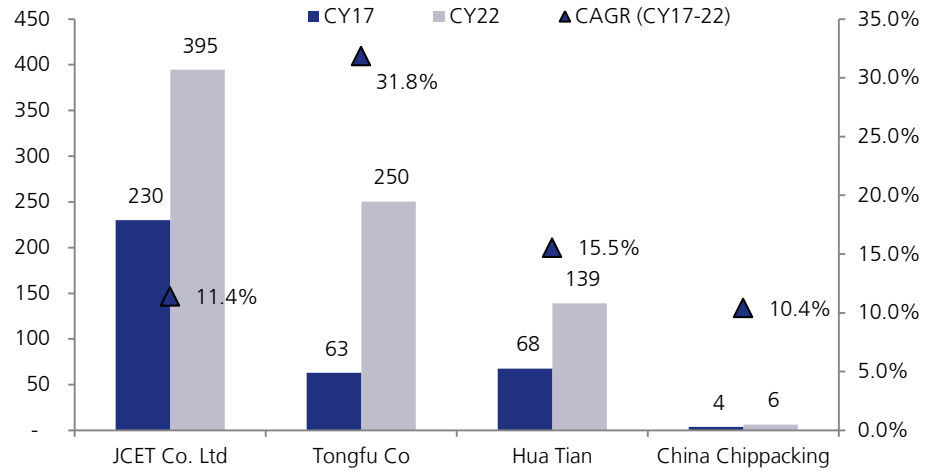
China expanded its efforts in the OSAT business via the acquisition route

In 2015, JCET, China's largest OSAT, acquired Singapore's STATS ChipPAC, a move that propelled China into the upper OSAT ranks. In the same year, Huatian, China's third largest OSAT, acquired US-based FlipChip International. OSAT companies in China continue to expand in line with its government's semiconductor domestication policy.

Financials of Chinese OSAT companies

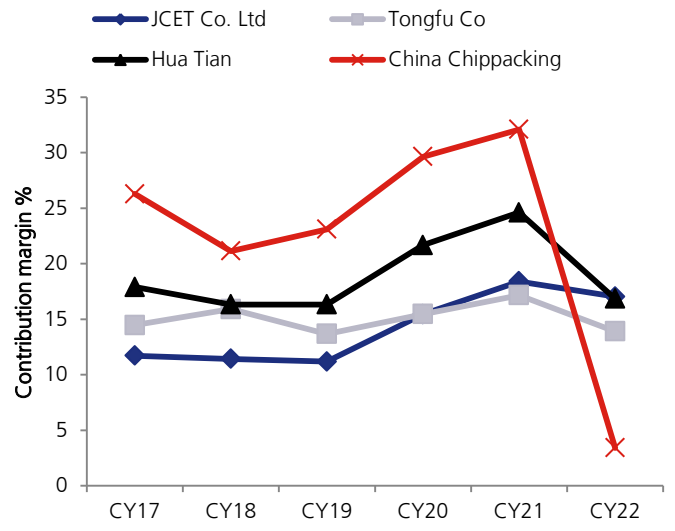
Top-3 Chinese OSAT players (JCET, Tongfu and Huatian), included in world's top-10, contribute c.80-85% of top-10 Chinese OSAT companies' revenue. Other Chinese OSAT companies include Payton Technology, China Resource Microelectronic, Wafer Level CSP, Taiji Semiconductor, Forehope, etc.

Exhibit 40. Revenue: Tonfu's rev CAGR was c.31% because AMD, a major IC design manufacturer, coordinated with the company



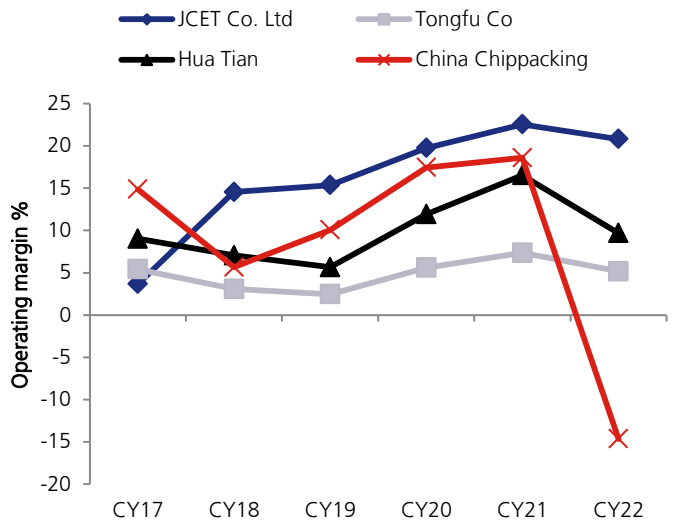
Source: JM Financial, Industry

Exhibit 41. Contribution margin (%): Historically ~13-17%. Chippacking was probably the only Chinese OSAT company that saw a 32% YoY decline in revenue in CY22



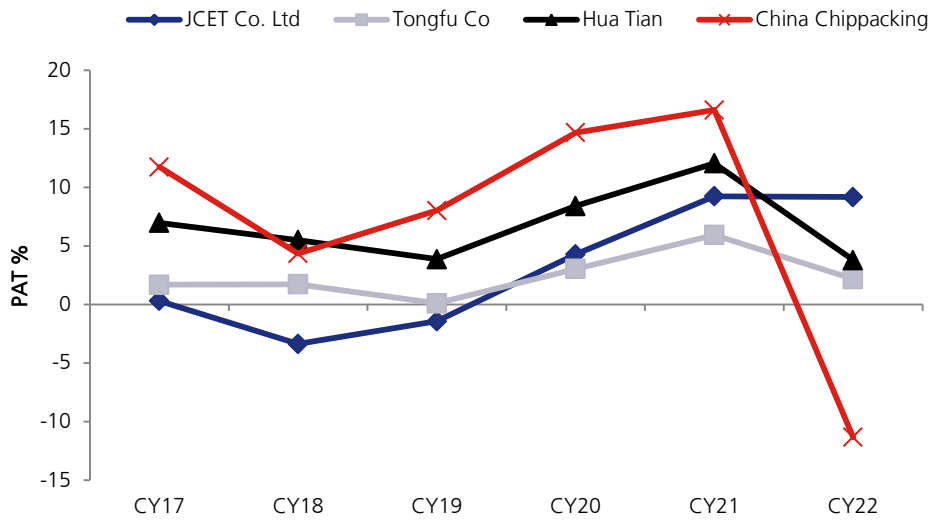
Source: JM Financial, Industry

Exhibit 42. Operating margin (%): Quite a bit of variability in OPM; we can see that China's #1 OSAT company (JCET) has historically higher OPM



Source: JM Financial, Industry

Exhibit 43. PAT margin (%): In CY22, JCET had the highest PAT margins, but historically, it lagged; overall PAT margins are in mid-single digits



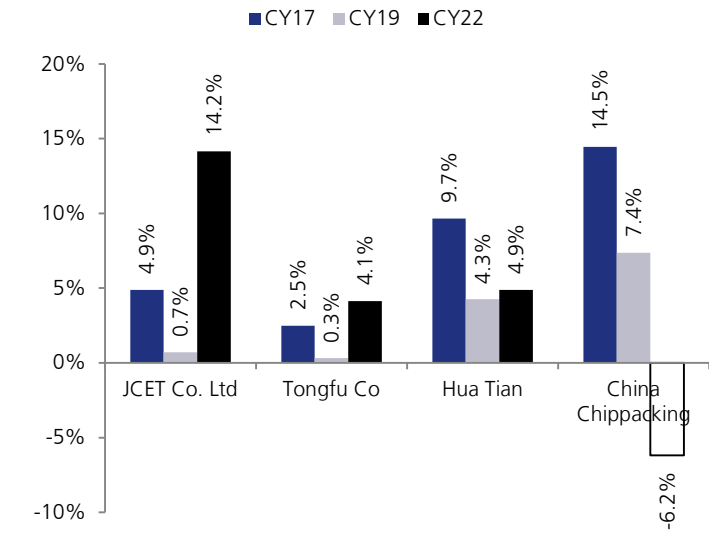
PATCAGR(CY17-22)
JCET–120%
Tonfu–39%
HuaTian–2%
Chippacking – NA

Source: JM Financial, Industry

Market bottomed in CY19, has been volatile since

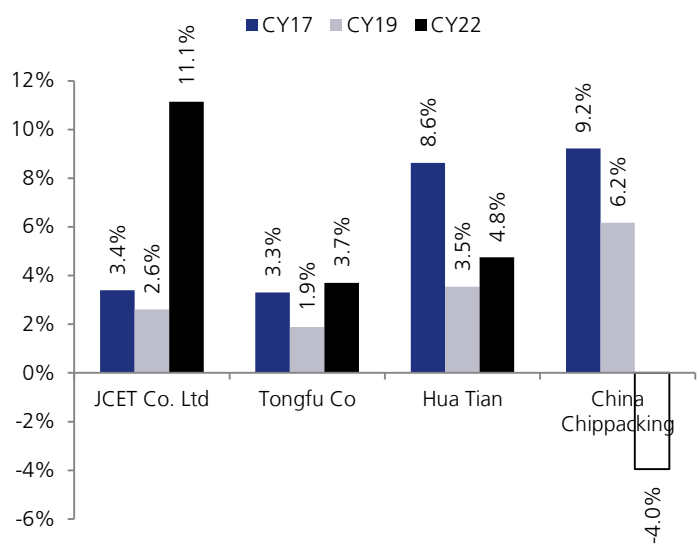
The financials of Chinese OSAT companies show that the market declined after CY17, and bottomed in CY19. From here, it gained traction, mainly due to shortage and supply chain issues attributed to the pandemic, rising significantly until CY21. In CY22, it declined again, which we believe is because of inventory de-stocking, and which is visible in CY23 as well.

Exhibit 44. RoE (%): Quite some variation; JCET has consistently reduced debt



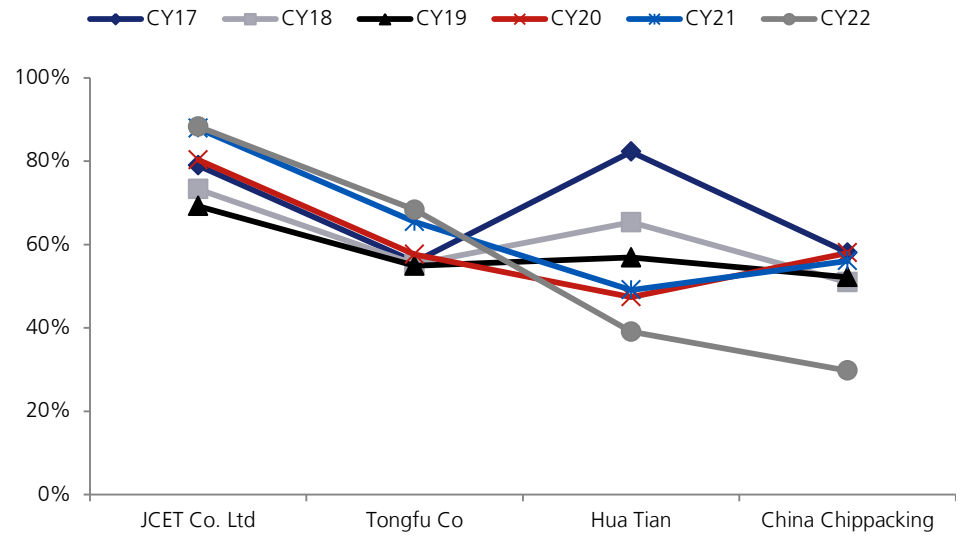
Source: JM Financial, Industry

Exhibit 45. RoCE (%): Variability; debt levels of players other than JCET increased



Source: JM Financial, Industry

Exhibit 46. Asset turns (x): Consistently below 1; stabilised at c.0.6x for these companies



Source: JM Financial, Source: JM Financial, Company Data

Exhibit 47. Debt and equity: The only Chinese company consistently reducing debt was JCET

Company Name	Debt			Equity		
(INR mn)	CY17	CY19	CY22	CY17	CY19	CY22
JCET Co. Ltd	145,277	149,607	94,470	93,988	129,270	295,421
Tongfu Co	27,830	58,370	143,501	61,413	66,506	174,571
Hua Tian	10,838	35,664	88,561	58,835	101,456	230,154
China Chippacking	2,441	1,664	6,710	3,373	4,811	10,667

Source: JM Financial, Industry

Taiwan ranks #2 in terms of global OSAT market share

As of 2021, there were 37 packaging and testing companies in Taiwan. Revenue increased by 16.3% from the previous year to reach NT$ 638.4bn in 2021, with NT$ 435.4bn in packaging and NT$ 203.0bn in testing.

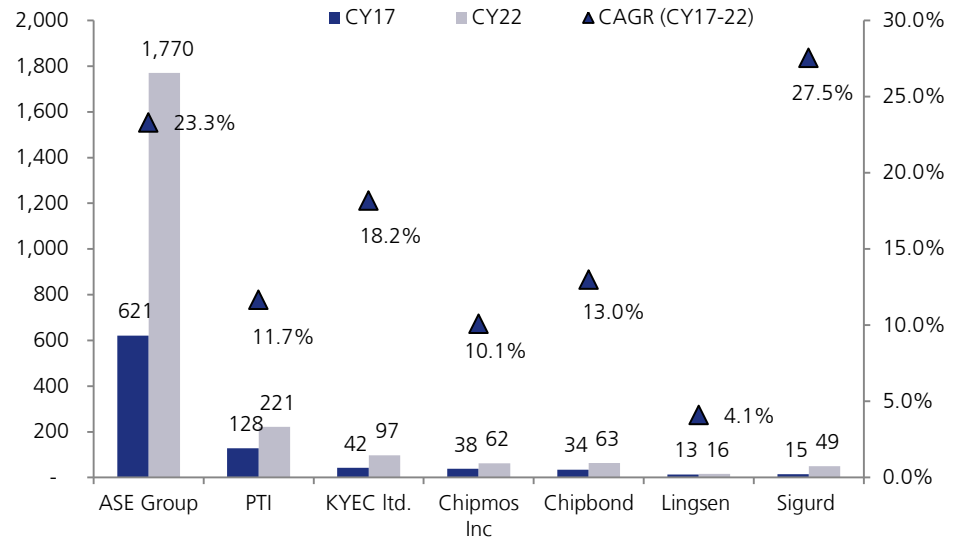
Exhibit 48. Major indices of Taiwan's packaging and testing industry

Particulars	2014	2015	2016	2017	2018	2019	2020	2021	2022(e)
No. of Companies	37	37	37	37	37	37	37	37	37
Revenue (NT$Bn)	454	441	464	477	493	501	549	638	695
Growth (%)	10.4%	-2.8%	5.1%	2.8%	3.4%	1.6%	9.6%	16.3%	8.9%
Capital investment/ Revenue (%)	21.0%	19.4%	20.5%	20.4%	21.7%	21.0%	20.0%	20.2%	20.0%
R&D Expense/ Revenue (%)	3.4%	3.6%	3.3%	3.2%	3.2%	3.3%	3.3%	3.1%	3.0%

Source: JM Financial, Industry

Revenue from top-5 companies (ASE technology holding, Powertech Technology (PTI), King Yuan Electronics Co. (KYEC), Chipmos and Chipbond) comprised a substantial 77.5% of Taiwan's total packaging and testing revenue, demonstrating the dominance of the top companies in the industry.

Exhibit 49. Revenue (INR bn): ASE group's CAGR of c.23% was mainly due to its capabilities in packaging and testing advanced node chips

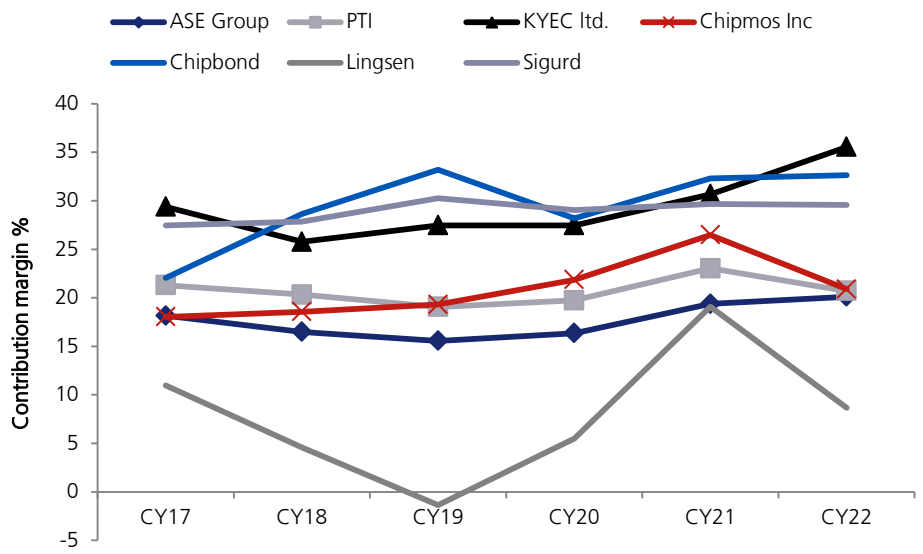


Source: JM Financial, Industry

All of ASE's segments (packing and testing – 54% of rev. EMS – 45%) saw almost similar CAGR over CY17-22

For PTI, the packing and testing segment (90% of rev.) saw high-single-digit CAGR over CY17-22

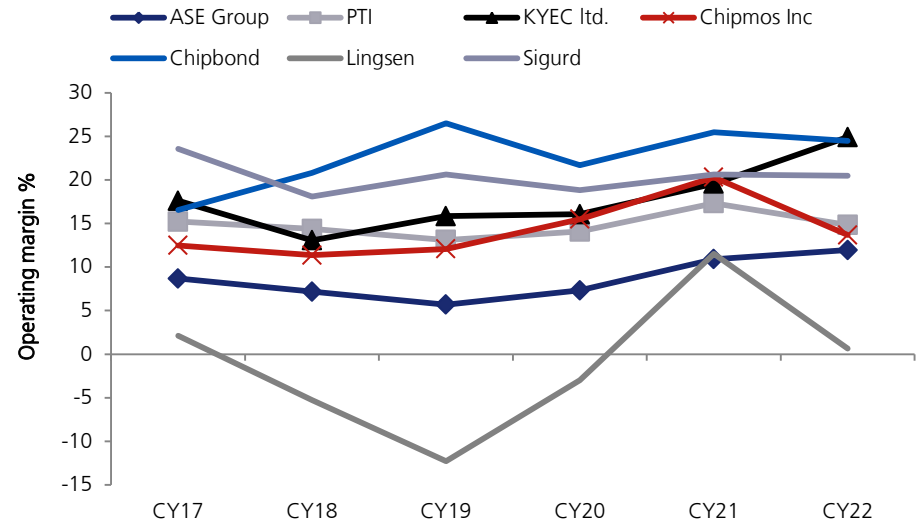
Exhibit 50. Contribution margin (%)



Source: JM Financial, Industry

Divergence - companies such as Sigurd, Chipbond, and KYEC saw higher margins (25-30%). Others such as ASE, PTI, and Chipmos had relatively lower margins (17-22%)

Exhibit 51. Operating margin (%)



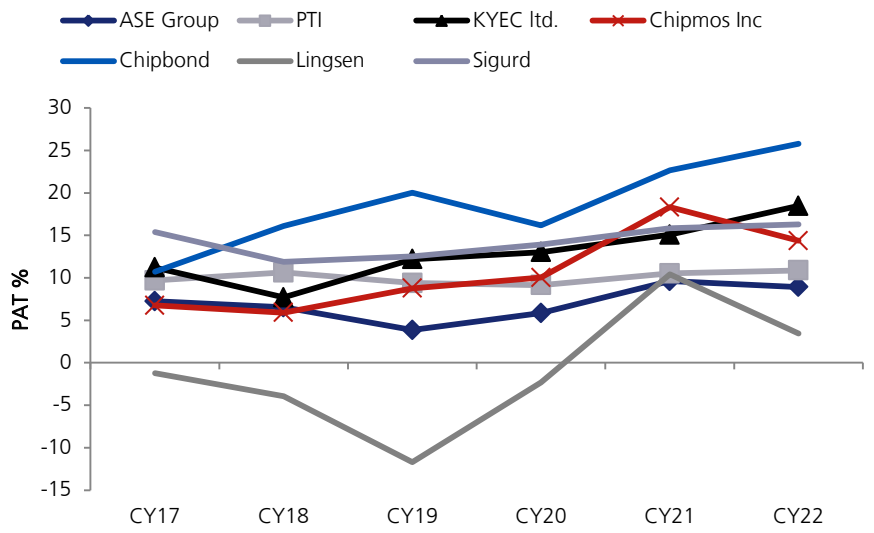
Source: JM Financial, Industry

Sigurd, Chipbond and KYEC had higher operating margins

PTI and Chipmos saw a steady increase until FY22

ASE had lower margins than peers, possibly because c.45% of its business is EMS

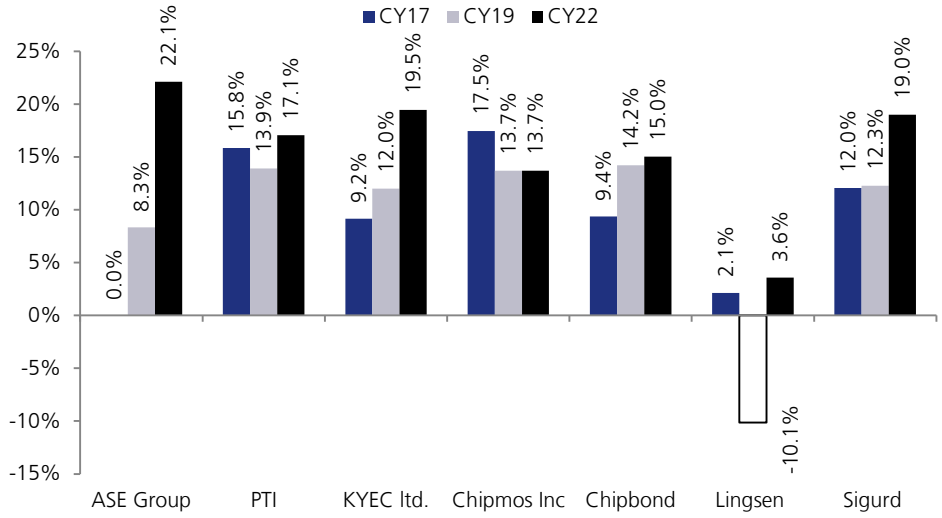
Exhibit 52. PAT margin (%)



Source: JM Financial, Industry

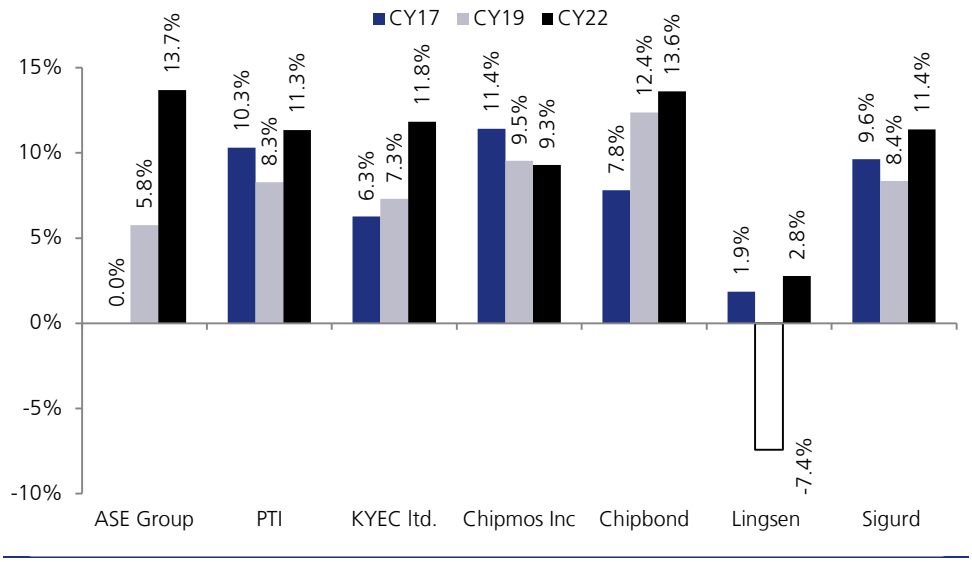
At a PAT level, Taiwan companies are better off than Chinese ones, as they achieved lower double-digit margins vs. mid-single digit margins of Chinese companies

Exhibit 53. RoE (%): Baring few, Taiwanese companies have higher double-digit RoE



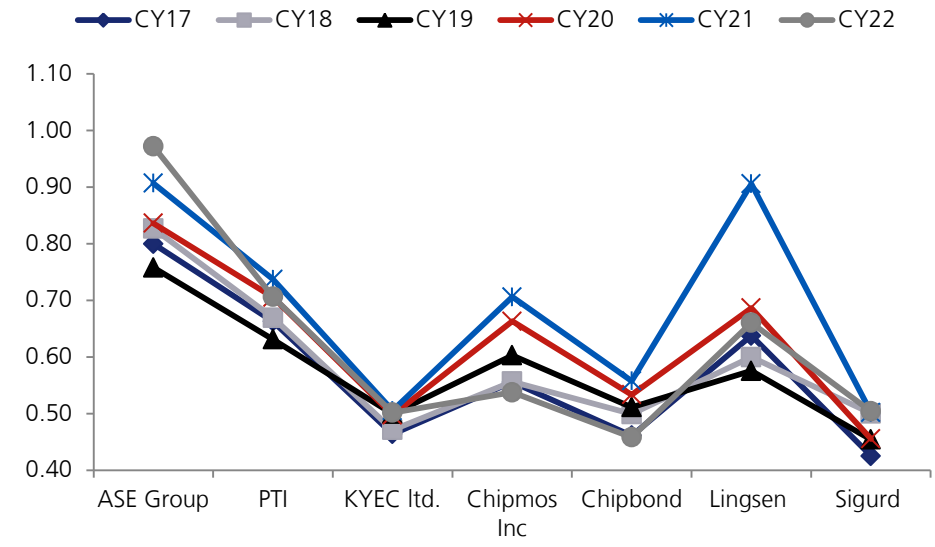
Source: JM Financial, Industry

Exhibit 54. RoCE (%): Baring few, Taiwanese companies have higher lower-digit RoCE



Source: JM Financial, Industry

Exhibit 55. Asset Turns (x)



Asset turns are slightly lower than Chinese companies; historically, at c.0.5x

Source: JM Financial, Industry

Exhibit 56. Debt and equity

Company Name	Debt			Equity		
(INR mn)	CY17	CY19	CY22	CY17	CY19	CY22
ASE Group	164,663	525,650	511,535	439,037	510,405	860,992
PTI	67,364	77,576	86,166	106,925	130,724	178,491
KYEC ltd.	25,861	52,628	72,125	53,915	62,384	99,429
Chipmos Inc	22,901	23,180	40,068	39,585	46,794	66,775
Chipbond	11,023	11,806	9,250	54,539	70,702	110,045
Lingsen	4,110	4,531	5,160	13,482	12,647	16,011
Sigurd	7,508	19,159	37,319	22,221	32,202	52,157

Source: JM Financial, Industry

Taiwan's manufacturing industry

Presently, significant global regions such as the US, the EU, China, and Japan lack the capacity for advanced chip production. In contrast, Taiwan holds a competitive advantage due to cost-efficient production, a skilled workforce, and strong government support for its semiconductor firms.

Taiwan Semiconductor Manufacturing Company (TSMC) and United Microelectronics Corp (UMC) are prominent Taiwanese contract chipmakers. TSMC's dominance stems from its advanced manufacturing prowess, rapid high-yield chip production on a large scale while United Microelectronics Corp (UMC) has comparatively less advanced capabilities.

Region-wise market share in manufacturing, 2022 – JM estimate

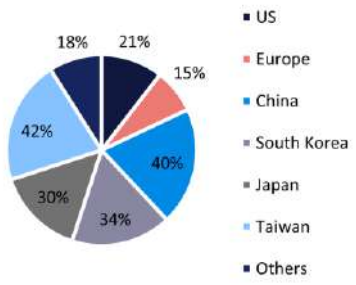
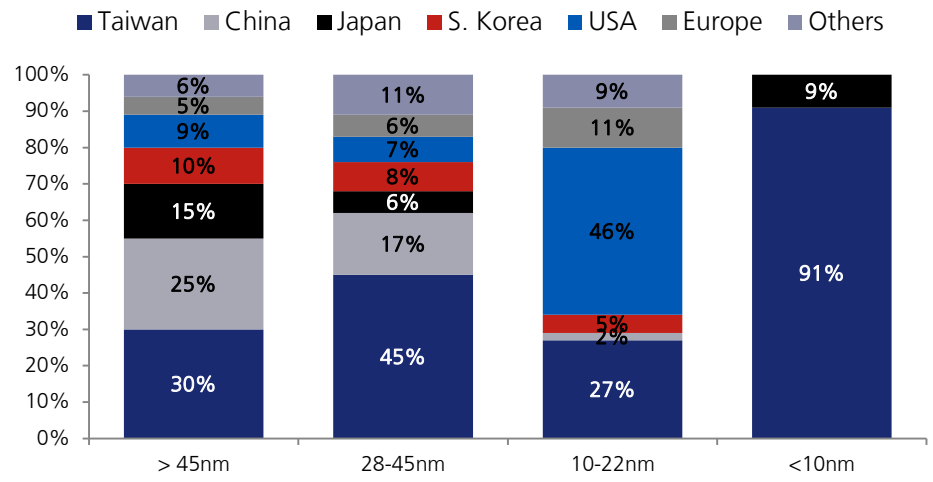


Exhibit 57. Region-wise market share in advanced chip production, 2022



Source: JM Financial, Industry

- Samsung and TSMC are neck to neck in developing advanced (under 10nm) chips. TSMC has a large capacity with proven technology for producing advanced chips and has high yield rates compared to Samsung.
- Intel designs and develops chips for itself but does not operate as a contract manufacturer. It will start foundry operations in 2025.
- SMIC has scaled to 7nm chip development but has been placed on the chip export blacklist by the US administration.
- GlobalFoundries manufactures less advanced (more than 10nm) chips.

Exhibit 58. Foundries' existing advanced chip production capabilities

Company	Region	3nm	5nm	7nm	10nm	>10nm
TSMC	Taiwan	in 2023	✔	✔	✔	✔
Samsung	S. Korea	✔	✔	✔	✔	✔
Intel	USA	✕	✕	in 2023	✔	✔
GlobalFoundries	USA	✕	✕	✕	✕	✔
UMC	Taiwan	✕	✕	✕	✕	✔
SMIC	China	✕	✕	✕	✕	✔

Source: JM Financial, Industry

What are low-nm chips? Where are they used?

- The lower the nanometer (nm), the more advanced the chips are.
- Low-nm chips provide faster processing and consume less power than high-nm chips.
- Emerging technologies such as high-performance computing, AI, 5G, autonomous vehicles, cloud computing, high-end gadgets, and metaverse rely on low-nm chips.
- Day-to-day components such as vehicles, refrigerators, calculators, and television use high nm (>10nm) chips.

De-risking Taiwanese mfg. and OSAT dependence

Any permanent disruption to Taiwan could create global economic disruptions that would require a minimum of 3 years and USD 350bn investment to build capacity in the rest of the world as a replacement for Taiwanese foundries. Building local supply chains in each region will require significant incremental investment of c.USD 1trln with a resulting 35-65% rise in semiconductor prices.

To curb dependence on Taiwan and prevent global supply chain disruptions, major semiconductor countries are announcing huge capex to establish the missing link of the semiconductor value chain. The table below illustrates the incentives offered by countries, taking a step towards self-reliance.

Exhibit 59. Major countries take steps to address global supply-chain disruptions

Country	Incentives offered
USA	• Congress passed the CHIPS* Act in Jan 2021 to promote R&D and manufacturing of domestic chips. • The USICA# Act in June 2021 and Americas COMPETES Act in Feb 2022 include **a US$ 52bn investment** in the sector. • Congress is considering legislation known as the FABS Act to establish a semiconductor investment tax credit.
Europe	• The European Commission announced a new European Chips Act involving **US$ 49bn** in public and private funding. This broad initiative would boost Europe's R&D innovation and bring leading-edge manufacturing to the region. • The goal is to double the EU's share in global chip production to 20% by 2030 – from 9%
China	• China implemented several policies, including tax reduction and funding support, to boost the semiconductor sector. • Since 2015, China has allocated at least US$ 180bn in support of this industry. By 2025, China aims to achieve 70% self-sufficiency in high-tech industries.
South Korea	• The government revealed the "K-Semiconductor Strategy" where chip makers pledged investments of over US$ 451bn by 2030. • Tax deductions and infrastructure packages were also planned to encourage chipmakers' competitiveness. This could lead to annual semiconductor exports increasing to US$ 200bn, which is twice the amount in 10 years.

Source: JM Financial, Industry

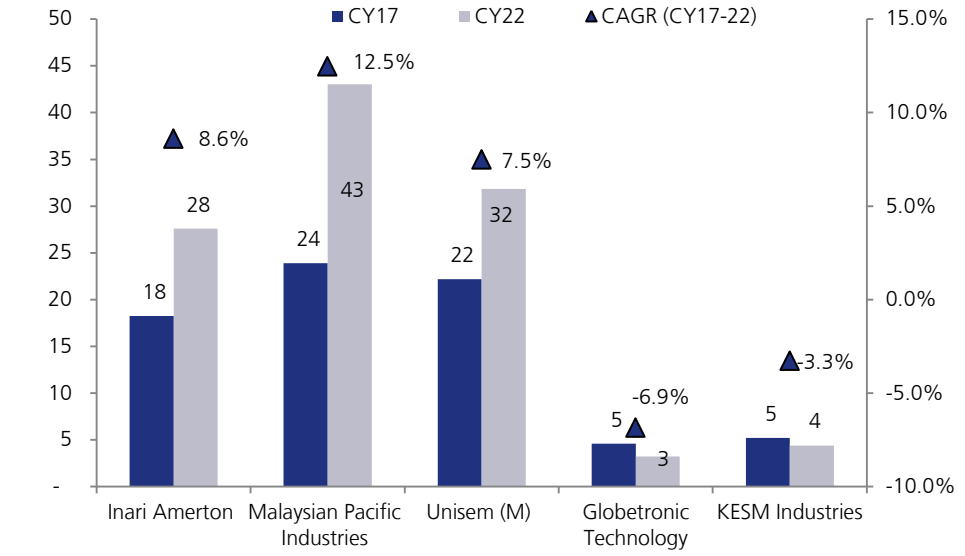
Malaysia's OSAT market – Potential technology partners for India

There are five listed OSAT companies in Malaysia – Inari Amerton, Malaysian Pacific Industries (MPI), Unisem (M), Globetronics, and KESM Industries. These companies offer to package or assemble solutions that involve the processing of bare semiconductors into finished semiconductor and help in protecting the die as well as facilitating electrical connections and heat dissipation.

Note on Globetronics

- It was founded in 1991 by Michael Chong, as an electronics manufacturing services (EMS) company. Over the years, Globetronics has shifted its focus, deviating from common semiconductor products and moving up the value chain, to more complicated and higher-value products (i.e., micro sensors, timing devices, SSL and LED) and services (i.e., assembly, packaging and testing).
- The sensors and optical products contribute c.61% of revenue while optoelectronics products, small outline components, LED components and modules account for c.39%. The products are used in electronics, satellite navigation, mobile phones, computers, etc.
- Main revenue is derived from Singapore (71.5%), Malaysia (24.4%), United States (4.0%) and others (0.1%).
- FY22 analysis: FY22 revenue was down 13% largely due to the scaling down of the 'Quartz crystal and timing devices' business. This segment accounted for 15% of FY21 group revenue, but reduced to 8% in FY22. To a lesser extent, the sensor segment has also seen its revenue contribution drop by 13% YoY, as a result of weak smartphone demand, and a competitive wireless ear-buds market.
- Customers: One of its major customers is AMS AG, which is the key component supplier of iPhone Face ID facial recognition. It mainly produces optical path components for the front camera, which generate the signals required by the Face ID.

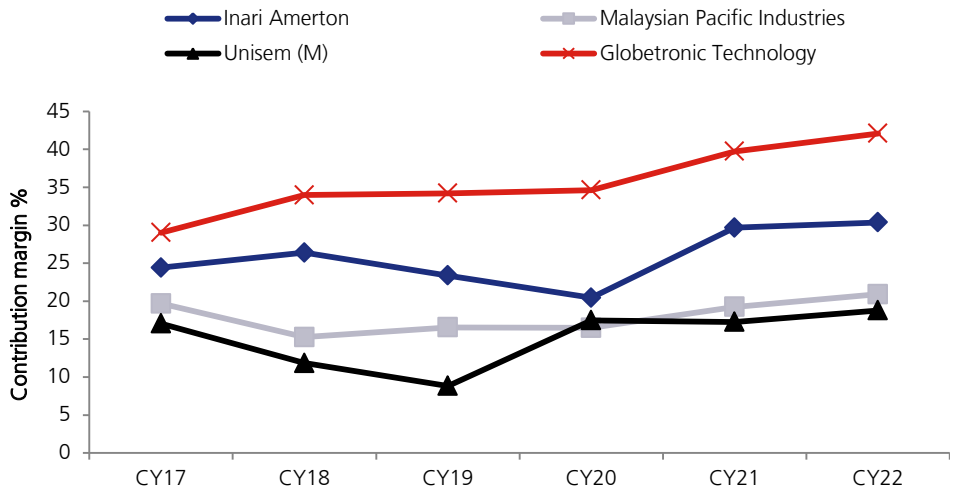
Exhibit 60. Revenue of Malaysian companies over CY17-22



Source: Industry, JM Financial, Industry

Revenue CAGR for Malaysian companies is lower than that of established Chinese and Taiwanese companies
Among all, MPI saw the highest revenue CAGR of 12.5% over CY17-22

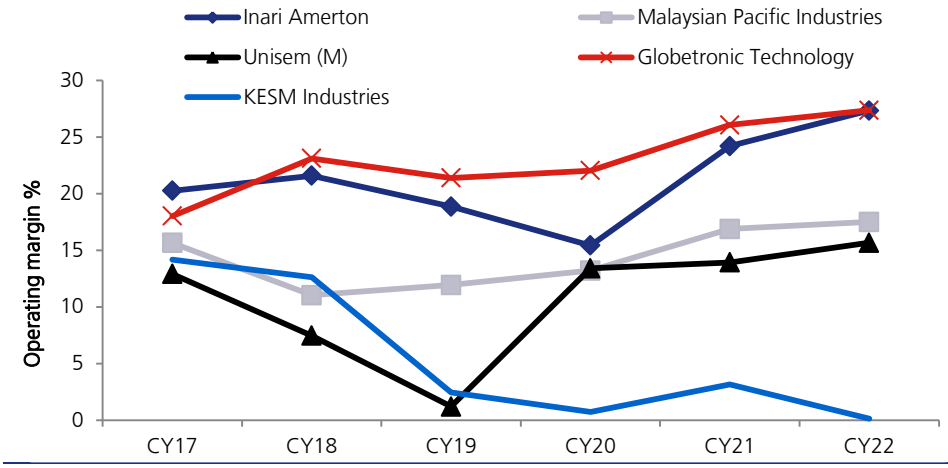
Exhibit 61. Contribution margin (%): Quite a bit of unevenness



Globetronics' margins have improved due to scaling down of its lower-margin timing devices business; its sensor business earns relatively higher margins

Source: JM Financial, Industry

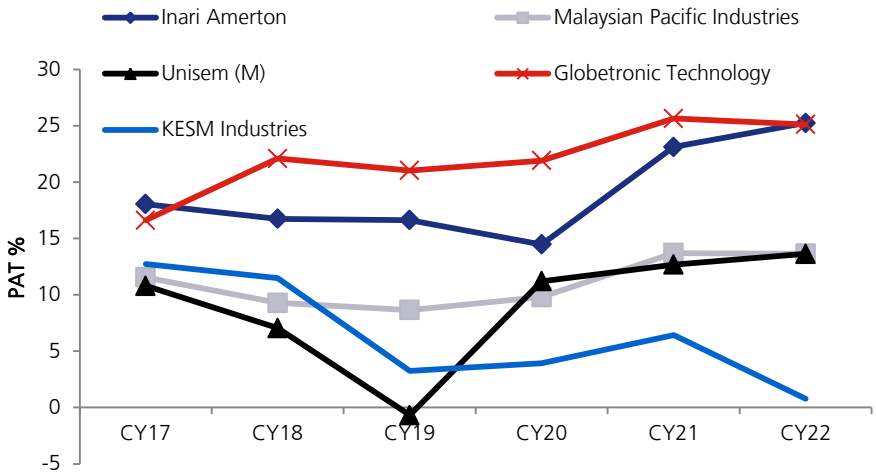
Exhibit 62. Operating margin (%)



Globetronics and MPI have seen a steady increase in operating margins, while they have fluctuated for others

Source: JM Financial, Industry

Exhibit 63. APT margin (%)

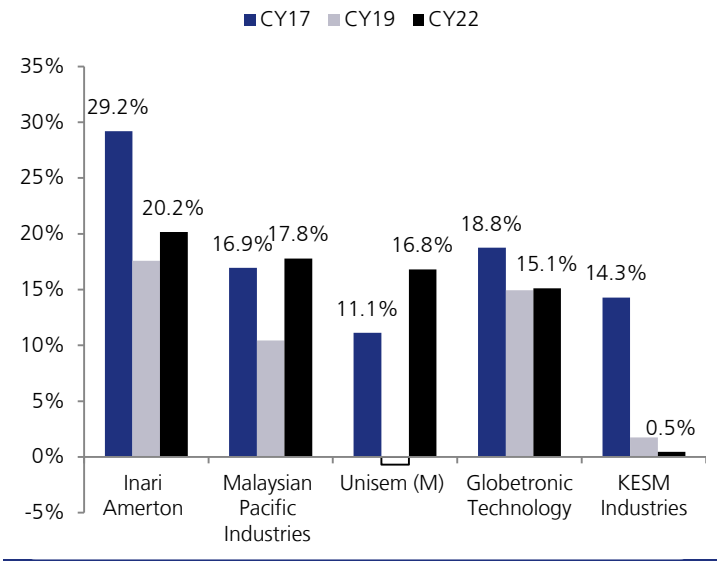


Globetronics has the highest PAT margins, consistently

Inari has seen significant changes in margins from CY20 to CY22

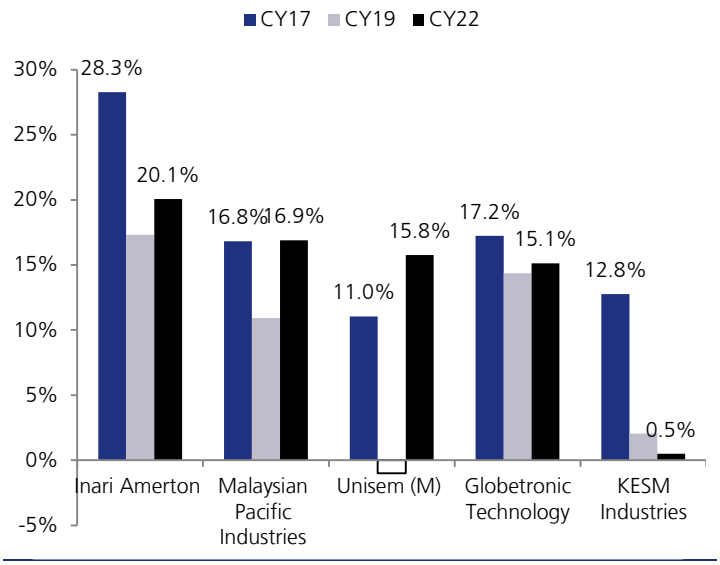
Source: Industry, JM Financial, Industry

Exhibit 64. ROE (%): Although Globetronics earns higher margins, Inari has higher RoE



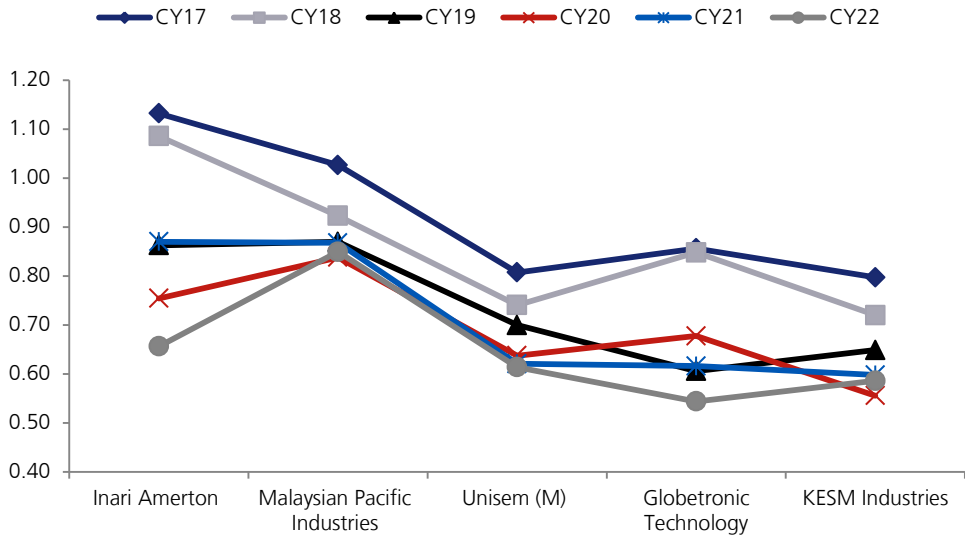
Source: JM Financial, Industry

Exhibit 65. ROCE (%): Most Malaysian companies saw a decline in returns over CY17-22



Source: JM Financial, Industry

Exhibit 66. Asset turn (x)



Source: JM Financial, Industry

In CY17, asset turns were over 1x, but in CY22, this number dropped to 0.6-0.8x with MPI at the higher end

Exhibit 67. Debt and Equity

Company Name	Debt			Equity		
(INR mn)	CY17	CY19	CY22	CY17	CY19	CY22
Inari Amerton	616	248	270	13,129	18,692	45,002
Malaysian Pacific Industries	1,383	NA	3,936	19,978	24,977	41,610
Unisem (M)	706	3,032	3,689	22,997	23,598	45,371
Globetronic Technology	805	72	NA	4,423	5,168	5,641
KESM Industries	1,041	1,025	487	4,933	6,003	6,465

Source: JM Financial, Industry

Globetronics and KESM have been consistently reducing debt; in fact, Globetronics is now a debt-free company

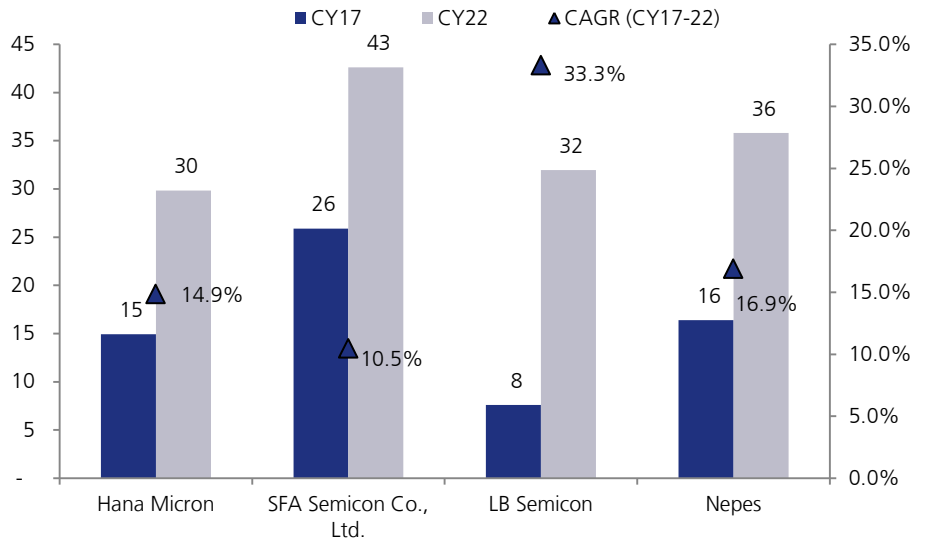
South Korea's OSAT market

In the Korean semiconductor ecosystem, the presence of OSAT companies is negligible, unlike in the US, Taiwan, and China.

The combined market share of all Korean back-end processing companies cannot even match that of Taiwan's PTI. Currently, only four Korean back-end processing companies are included in the global top-25. They are Hana Micron, SFA Semiconductor, LB Semicon, and Nepes.

The Korean back-end processing industry is also faced with a shortage of manpower. As of 2020, the number of Korean packaging specialists is around 50, while TSMC's R&D workforce increased 2.6x to 7,404 in 2020 from 2,881 in 2010.

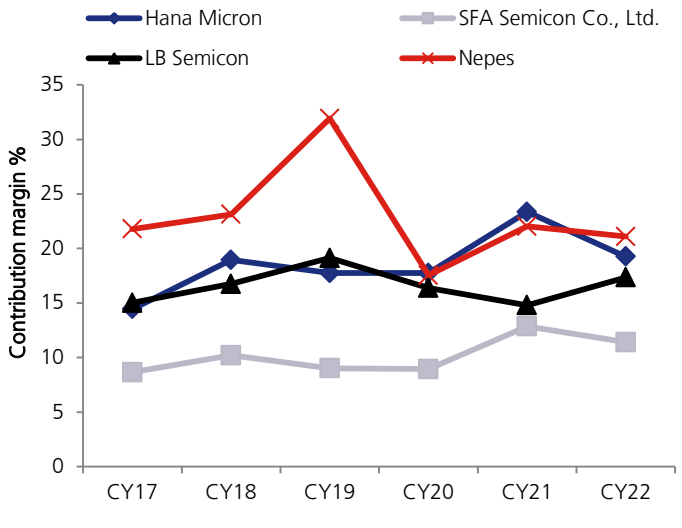
Exhibit 68. Revenue: CY22 revenue of all South Korean companies was in a similar range



Source: JM Financial, Industry

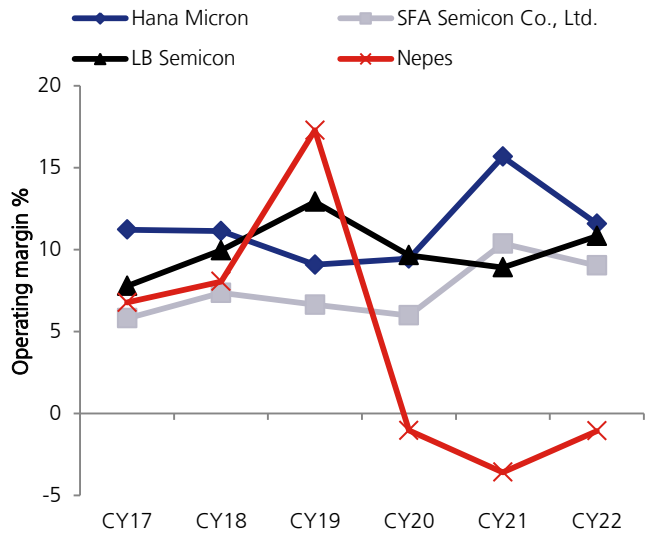
LB Semicon saw the highest revenue CAGR due to a small base

Exhibit 69. Contribution margin (%): Range-bound at 16-20%; SFA seems to have given up margins for higher revenue growth



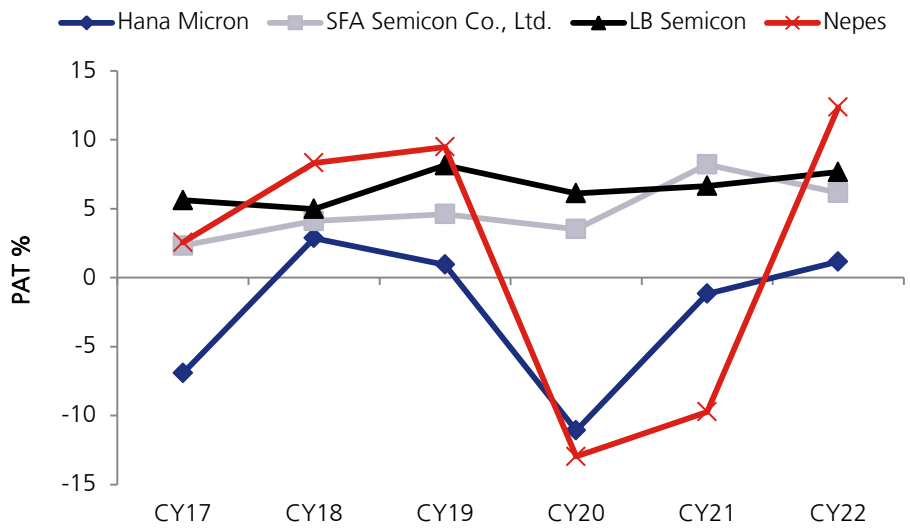
Source: JM Financial, Industry

Exhibit 70. Operating margin (%): Has fluctuated, but in CY22, it was range-bound at 8-11%, except for Nepes



Source: JM Financial, Industry

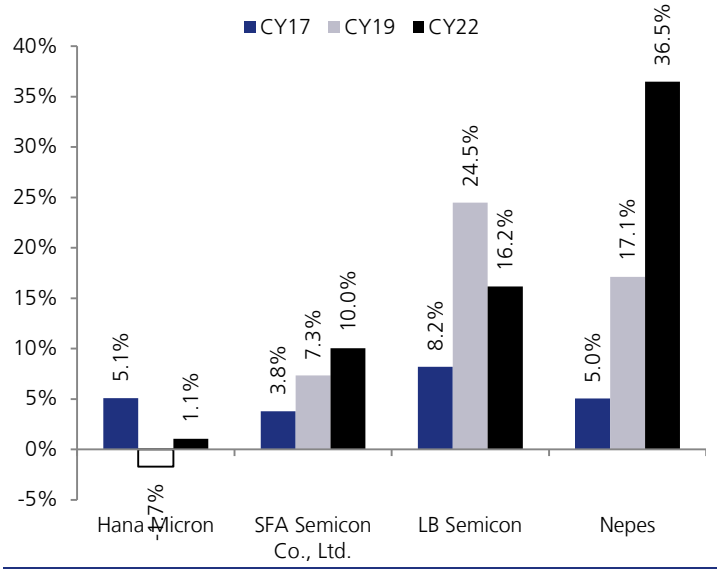
Exhibit 71. PAT margin of South Korea – OSAT Compaines



Historically, SFA and LB have been in the mid-single-digit range

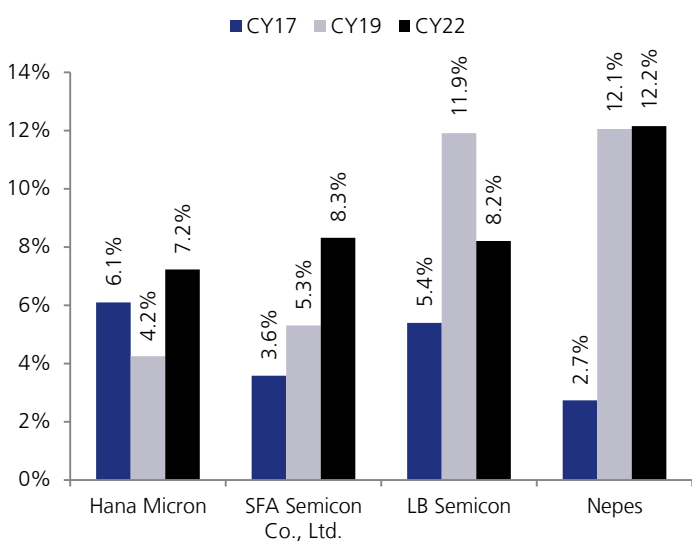
Source: JM Financial, Industry

Exhibit 72. ROE (%): RoE in CY22 higher than CY17 levels, except for Hana Micron



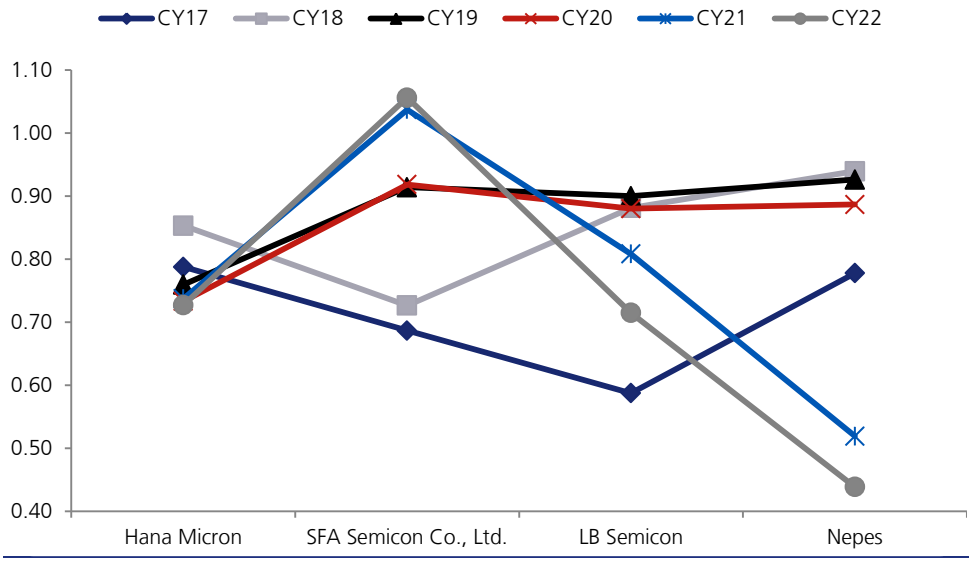
Source: JM Financial, Industry

Exhibit 73. ROCE (%): RoCE up in CY22 for all companies vs. CY17 levels



Source: JM Financial, Industry

Exhibit 74. Asset turns (x): Only South Korean cos have variability in asset turns, though it has remained below 1x



Source: JM Financial, Industry

Exhibit 75. South Korea's OSAT companies - OSAT and Equity

Company Name	Debt			Equity		
(INR mn)	CY17	CY19	CY22	CY17	CY19	CY22
Hana Micron	12,341	12,192	19,552	7,379	8,302	12,908
SFA Semicon Co., Ltd.	16,099	14,768	7,940	16,129	19,477	31,858
LB Semicon	6,624	12,164	19,932	6,007	11,673	25,092
Nepes	7,242	10,956	36,700	7,231	11,756	25,828

Source: JM Financial, Industry

Most companies increased their debt substantially, except SFA, which reduced it by c.50% over CY17-22

USA's OSAT market

USA-based Amkor, currently the world's #2 semiconductor packaging company, aims to top the sector dominated by Taiwan rivals, including industry leader ASE Holdings. It has c.20 packaging facilities with more than 30,000 employees in eight countries. The company is concentrating on semiconductor packaging for automobiles as the global car industry is rapidly growing with electric vehicles and future mobility.

Amkor completed a semiconductor packaging and test facility in Vietnam in Oct'23 and plans to start its mass production in 4Q.

"We developed cutting-edge technology based on active investment and became the world's top OSAT company for automotive semiconductors," said an Amkor official

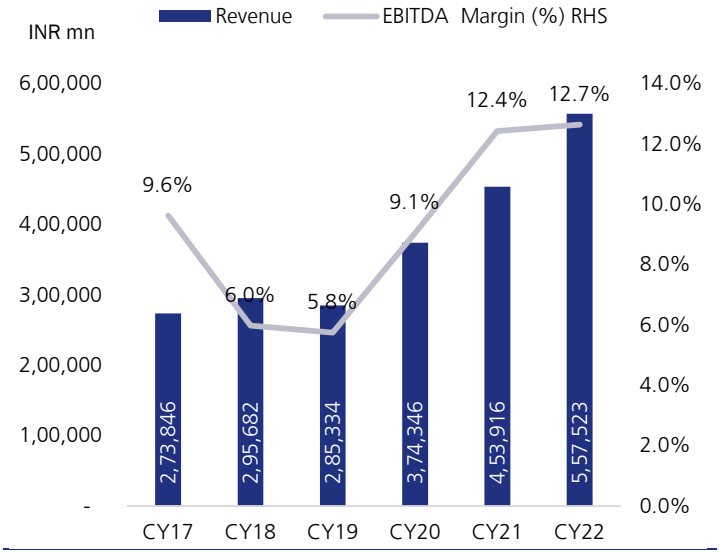
Exhibit 76. Amkor's packaging plant in Vietnam under construction

Source: JM Financial, Industry Company data. #This pic was taken in May/ June when the factory was under construction.

CAGR over FY 17-22

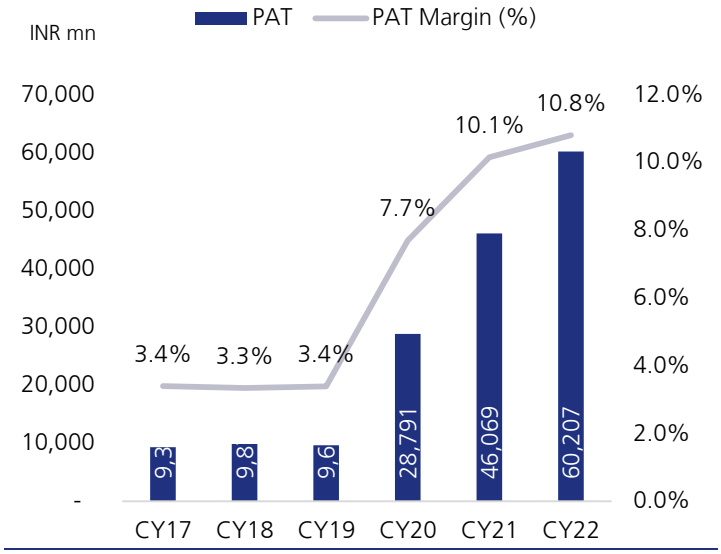
Revenue: 15.3%
Contributing Profit: 16.1%
Operating Profit: 21.7%
PAT: 45.2%

Exhibit 77. Amkor reported a strong revenue growth with improving OPM



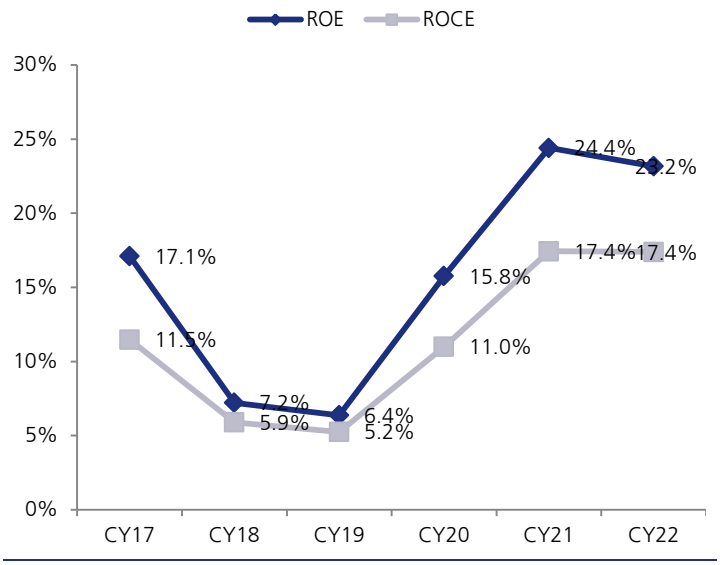
Source: JM Financial, Industry

Exhibit 78. PAT and PAT margins reported a strong improvement from CY17 to CY22



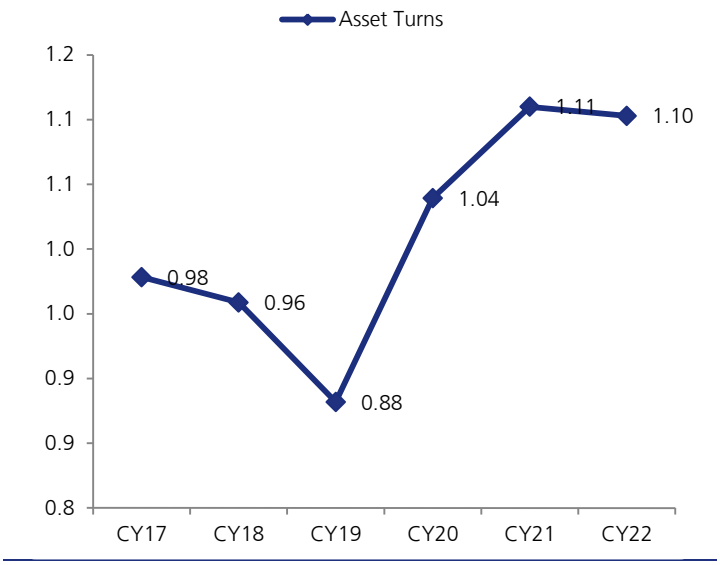
Source: JM Financial, Industry

Exhibit 79. Amkor RoE vs. RoCE: Since the semiconductor chip shortage in the pandemic, returns have increased significantly



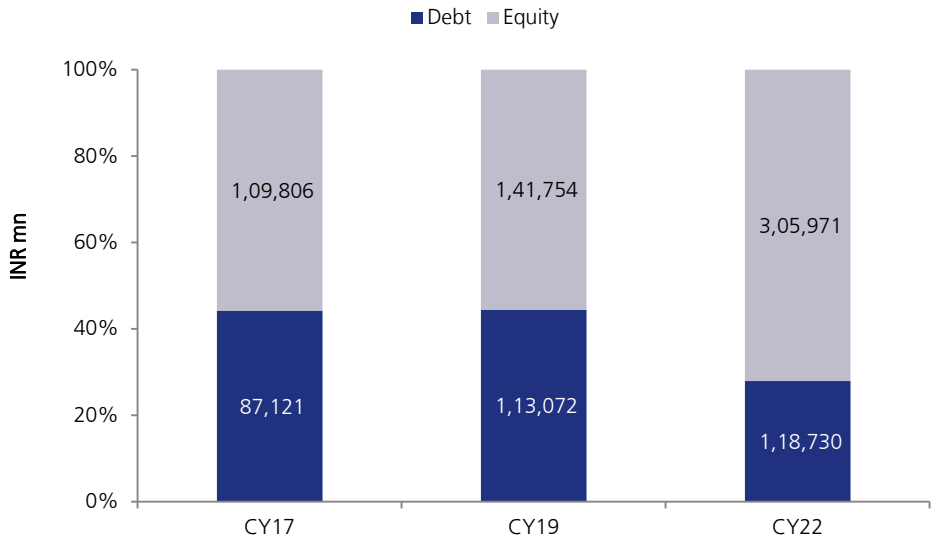
Source: JM Financial, Industry

Exhibit 80. Amkor asset turns (x): Assets turns of greater than 1, highest among OSAT companies across regions



Source: JM Financial, Industry

Exhibit 81. Debt vs. equity



Source: JM Financial, Industry

Debt has risen 3x over CY17-22; in CY22, it had a debt-to-equity ratio of c.2.6x up from c.1.3x in CY17

ASE (Taiwan) vs. Amkor (USA): A comparison

- ASE and Amkor are the two largest OSAT companies in the world, with a combined global market share of c.56% (in terms of total revenue in CY20).
- ASE has a more diversified business with complementary services providing EMS, while Amkor solely provides assembly and testing services. This makes ASE a one-stop-shop for semiconductor companies for packaging, testing, and EMS.
- ASE gets 53% revenue from the communications segment, while Amkor gets 38%. However, Amkor leads, and remains highly committed to the automotive segment – from where it gets 20% of its revenue vs. 3% for ASE.

ASE Technology Holding Co., Ltd. vs Amkor Technology

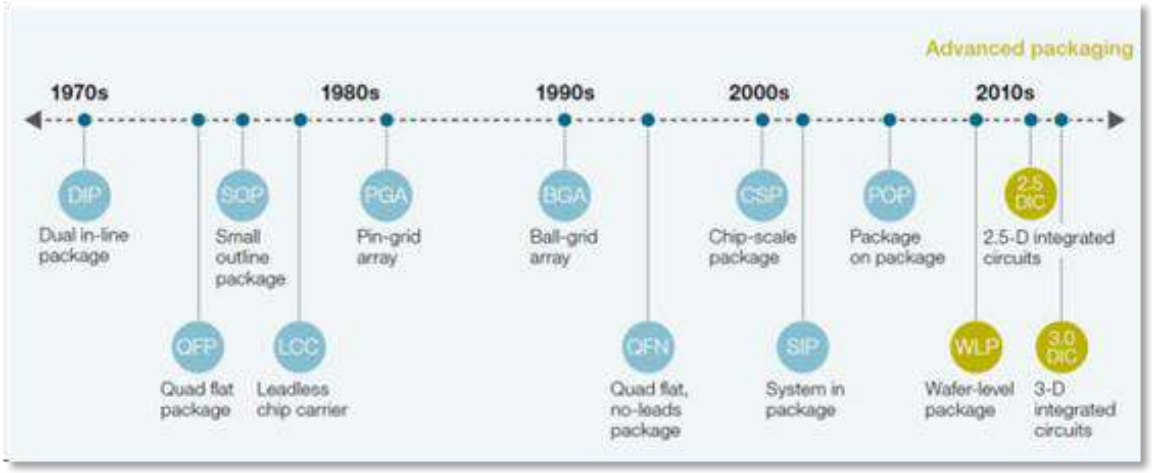
Annexure 1: Advanced packaging

Advanced packaging refers to a subset of conventional semiconductor packaging that uses novel techniques and materials to increase integrated circuit performance, power, modularity, and durability. These advanced packages have a variety of benefits: lower latency, increased bandwidth, better efficiency and power delivery, and higher input/output density.

There are about 1,000 different package types available to semiconductor manufacturers. Package types are differentiated and segmented by interconnect type. Interconnects are what connect one finished semiconductor chip to another in a package. The purpose of interconnects is to transmit electronic signals between semiconductors and PCBs quickly and accurately. More advanced packaging techniques are associated with a decrease in package size and power consumption along with an increase the density of interconnects.

Wire bonds, the prevalent interconnects in current packaging, face a challenge. Their size hasn't scaled down in tandem with transistor density, resulting in a communication gap Advanced packaging addresses this by employing innovative approaches like "bumps," "balls," or "wafer-level packaging" instead of wires to connect chips

Exhibit 82. Electronic packaging evolution from 1970s to present



Over time, manufacturers have employed different types of packaging techniques depending on the system into which the ICs are incorporated

Source: JM Financial, Industry Seunghyuk Choi, Christopher Thomas, and Florian Weig, "Advanced-Packaging Technologies: The Implications for First Movers and Fast Followers" (McKinsey, 2014)

Exhibit 83. Types of advanced packaging technologies – a non-exhaustive list

Advanced packaging technology	Notable sub-segments	Advanced packaging wafer spilt, 2020	Wafer spilt compound annual growth rate, 2019-25	Leading firms
Flip-Chip	Chip Scale Package	43%	8%	ASE, Amkor, TSMC, JCET
	Ball Grid Array			OSATs: ASE, Amkor, JCET IDMs: Micron, SK Hynix, Samsung
2D, 2.5D, 3D Stacking	N/A	5%	15%	Intel, TSMA, Samsung, SK Hynix, Sony
Fan-Out	Wafer-level packaging	4%	15%	TSMC, ASE, JCET
	Panel-level packaging		12%	Samsung, ASE
Fan-In	Wafer-level packaging	48%	5%	TSMC, ASE, JCET, Amkor
Embedded System in Package (SiP)	N/A	<1%	23%	ASE, SEMCO

Source: JM Financial, Industry

Annexure 2: Global OSAT company briefs

Exhibit 84. Annexure 2: Global OSAT company briefs

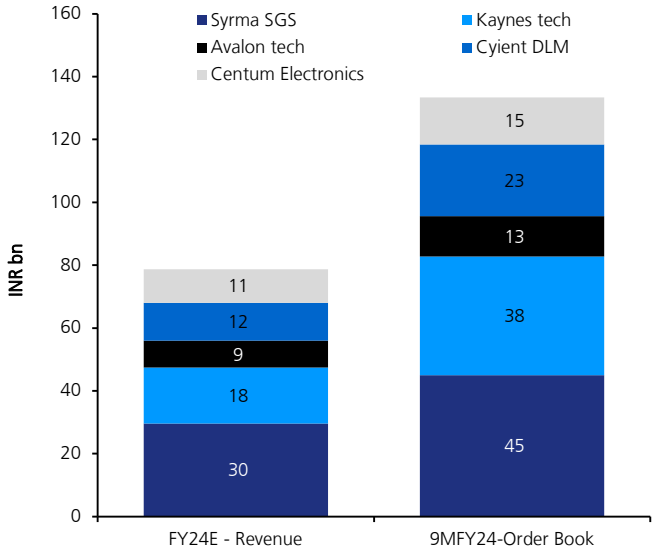
Sr. No.	Company Name	Country	Incorporation Year	Brief Info
1	JIANGSU CHANGJIANG ELECTRONICS TECHNOLOGY CO. LTD	China	1998	Testing and distribution of integrated circuits, discrete devices, chip design and manufacture of discrete devices.
2	TONGFU MICROELECTRONICS CO	China	1997	Makes integrated chips, provides assembling and testing service for memory, microprocessor, micro-controller, hybrid circuit, analog circuit, and other related services throughout China.
3	TIANSHUI HUATIAN TECHNOLOG-	China	2003	Specializes in IC testing and packaging for the semiconductor ICs, devices and components
4	CHINA CHIPPACKING TECHNOLO	China	2006	Provides integrated circuit packaging solutions. Testing, quad flat no-lead (QFN) packaging, and other services. Offers services in China.
5	INARI AMERTON BERHAD	Malaysia	2006	Investment holding company involved in the electronics manufacturing services (EMS) industry. Via subsidiaries, it provides semiconductor packaging services such as back-end wafer processing, assembly and testing for global customers in Radio Frequency (RF) and in Optoelectronic products. Has manufacturing facilities in Malaysia, China and Philippines. Customers: Microchips, Qorvo, Skywork, Solutions, Qualcomm, Broadcom, Osram, Elmos, Richtekm Epson
6	MALAYSIAN PACIFIC INDUSTRIES BERHAD	Malaysia	1962	Investment holding company; subsidiaries are engaged in providing OSAT and manufacturing of lead frames for its customers across the globe Customers: Elmos, Qorvo, Infineon, Allegro Microsystem
7	UNISEM (M) BERHAD	Malaysia	1989	It manufactures semiconductor devices. Provides turnkey solutions to its customers in wafer grinding, packaging and testing of integrated circuits, tape and reel, and dropship services. Packaging and testing wide range of lead frame packages. Customers: Qorvo (its customer base is APPLE), Skywork Solutions, Broadcom, Elmos, Allegro Microsystems, Microchip and Renenas
8	GLOBETRONIC TECHNOLOGY BERHAD	Malaysia	1991	Through its subsidiaries, manufactures and assembles integrated circuits, optoelectronic products, technical ceramic substrates, ESD protective materials, small outline components, and technical plating services and packaging materials. Globetronics also sells computer hardware and software.
9	KESM INDUSTRIES BERHAD	Malaysia	1978	It provides burn-in services, including electrical testing of semiconductor IC and tape and reel assembly. KESM is only involved in burn-in and test, not in semiconductor assembly.
10	HANA MICRON	South Korea	2001	Designs, develops, manufactures, and sells semiconductor packages for memory and non-memory semiconductor products. Also produces USB flash drives (UFDs).
11	SFA SEMICON CO., LTD.	South Korea	1998	Manufactures semiconductor chips, such as small out-line package (SOP), dual in-line package (DIP), and quad flat package (QFP) for network, communication, and home electronic products. Also produces application chips for personal computer (JM) cameras and camera modules.
12	LB SEMICON	South Korea	2000	Specializes in the back-end line of semiconductor manufacturing as well as components for display equipment. Main services include flip chip bumping for DDI (display driver IC), CIS (CMOS Image Sensor), and other related non-memory semiconductor testing services.
13	NEPES CORP	South Korea	1990	Manufactures semiconductors, such as driver integrated circuits (IC) for thin film transistor-liquid crystal display (TFT-LCD). Successfully mass-produced advanced packaging applying bumping technology for the first time in Korea in 2000.
14	ASE GROUP	Taiwan	1984	Offers assembly and testing services. Provides outsourced assembly, semiconductor testing, semiconductor packaging, and other related services. ASE Technology Holding operates in Taiwan.
15	POWERTECH TECHNOLOGY INC	Taiwan	1997	Major services of the company are Chip Probing, Bumping, WLP, Packaging, Final Test, and Module Assembly
16	KING YUAN ELECTRONICS CO. LTD	Taiwan	1987	Provides testing services include wafer probing (approximately 43%), final testing (approximately 50%), and preassembly services (approximately 7%)
17	CHIPMOS TECHNOLOGIES INC	Taiwan	1997	Offers a full range of back-end testing services for liquid crystal display (LCD) drivers, high-density memory, and mixed-signal semiconductors.
18	CHIPBOND	Taiwan	1997	Manufactures semiconductor products. Manufactures and markets semiconductor gold bump and eutectic solder bump, as well as TCP (tape carrier packaging), COF (chip on film), and COG (chip on glass) services. Provides chip testing services for customers worldwide.
19	LINGSEN PRECISION INDUSTRIES LTD	Taiwan	1970	It provides packaging and testing services for IC (integrated circuit) products.
20	SIGURD MICROELECTRONICS CORP	Taiwan	1988	Provides integrated circuit (IC) testing and packaging services. Also designs and manufactures ICs.
21	AMKOR TECHNOLOGY INC	USA	1968	Provides semiconductor packaging and test services. Offers deep submicron wafer fabrication, wafer probe testing, integrated circuit packaging assembly and design, final testing, reliability testing, burn-in, and electrical characterization. Customers: Intel Corporation; Renesas Electronics Corporation; STMicroelectronics N.V.; Texas Instruments Incorporated and Toshiba Corporation

Source: Industry

Company Section

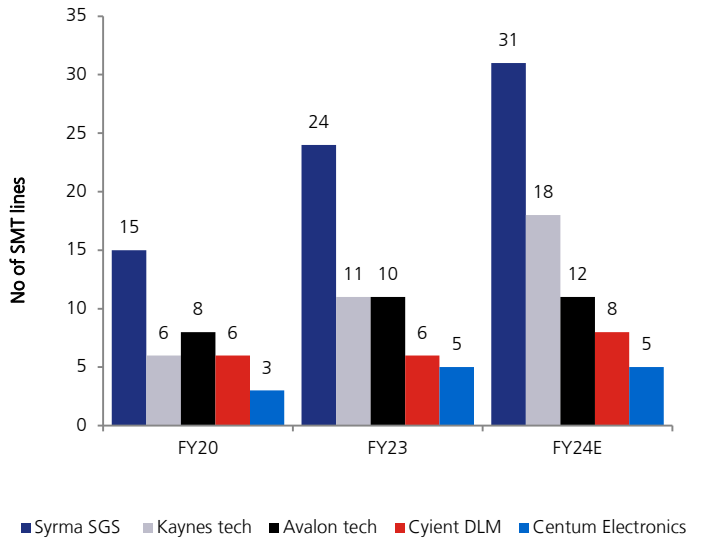
Emerging Giants of Electronics

Exhibit 1. Companies witnessed improved OB visibility to c.2x



Source: JM Financial, Industry

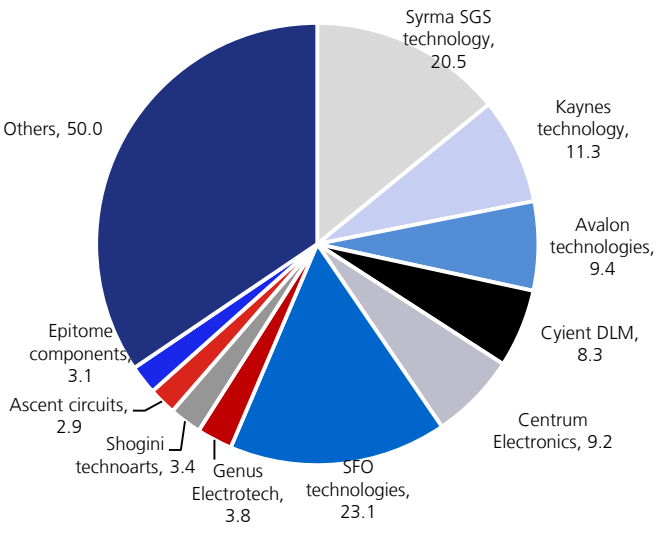
Exhibit 2. Resulted in strong capacity addition



Source: JM Financial, Industry

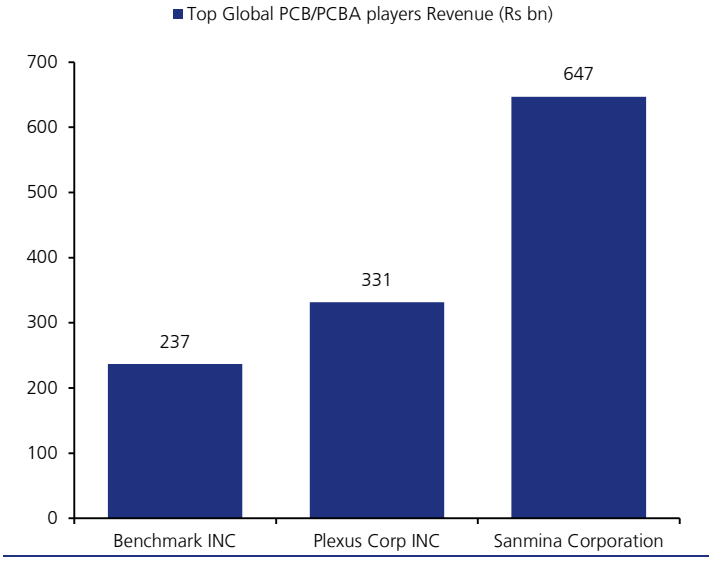
Overall with last 2-3 years, India EMS industry witnessed strong improvement in order book both from domestic and export market. This was mainly because of China +1, supportive government policy, increasing government focus on Make – in – India and supportive cost structure. This has resulted in order book to bill of c.2.0x for India EMS companies. Companies have also increased the capacity to support the growth. Currently in India we have c.1,800 SMT lines with as grown from c.1,200 in FY20 JMFe. Major addition by leading domestic and global players.

Exhibit 3. Total Revenue of India PCBA Ind. is c.INR.145 bn as on FY23.



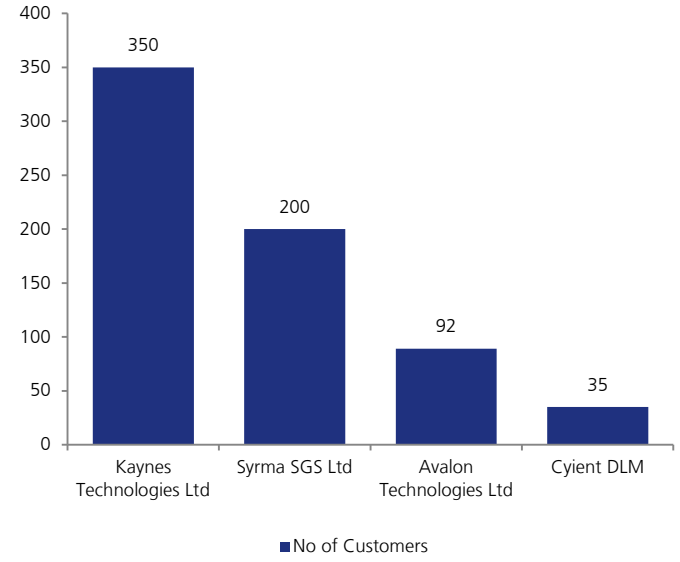
Source: JM Financial, Industry

Exhibit 4. We expect over next 4-5 years, INDIA EMS companies will achieve the size of the global companies.



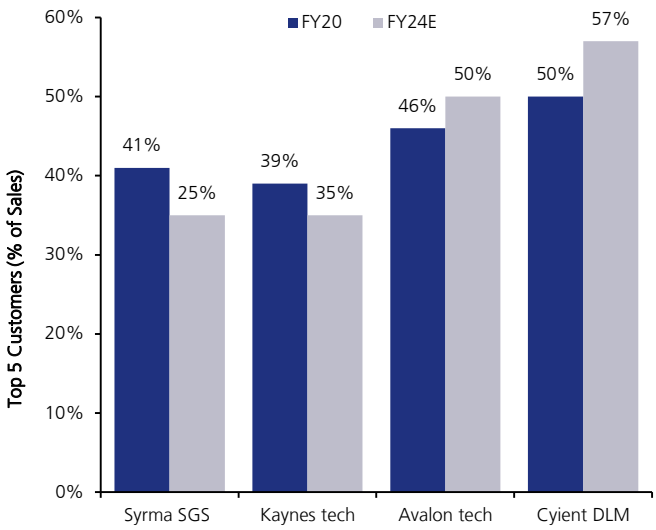
Source: JM Financial, Industry

Exhibit 5. EMS companies are increasing the customer base with….



Source: JM Financial, Industry

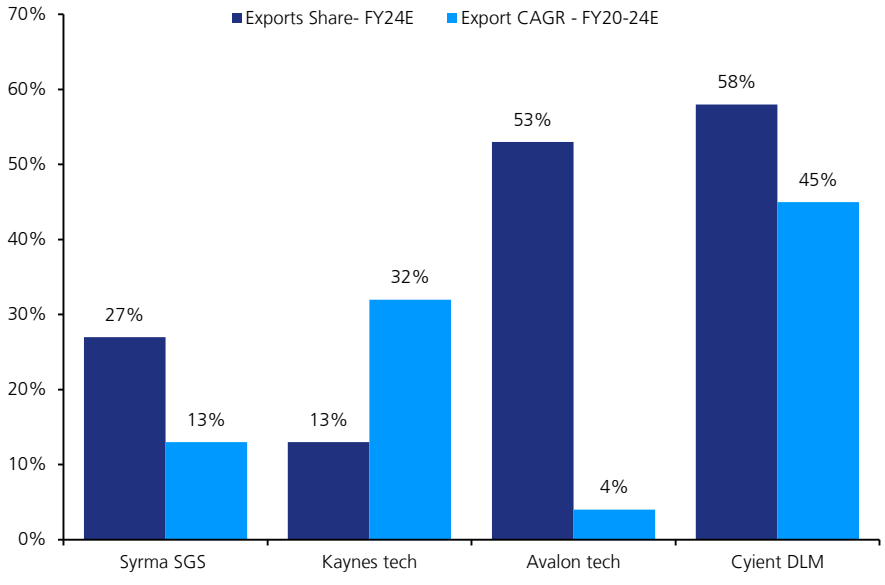
Exhibit 6. Increasing the share in existing customer. Now companies are looking to shift the supply chain to India.



Source: JM Financial, Industry

India EMS players are witnessing increase in the customer base as many brands are looking to shift the supply chain to India. Along with current customers are increasing the exposure to India. We expect over next 2-3 years India EMS companies will see significant addition in new brands and also increase the share in export market.

Exhibit 7. EMS players increasing Export share.

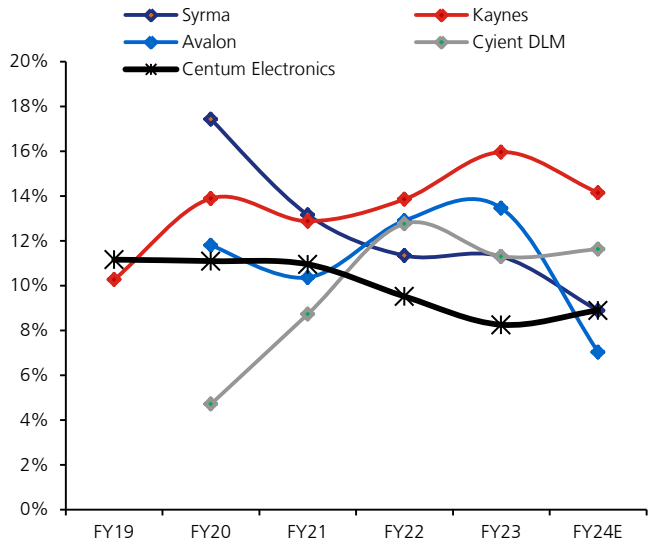


Source: JM Financial, Industry

We expect exports to witnessed 30%-40% growth for India EMS industry.

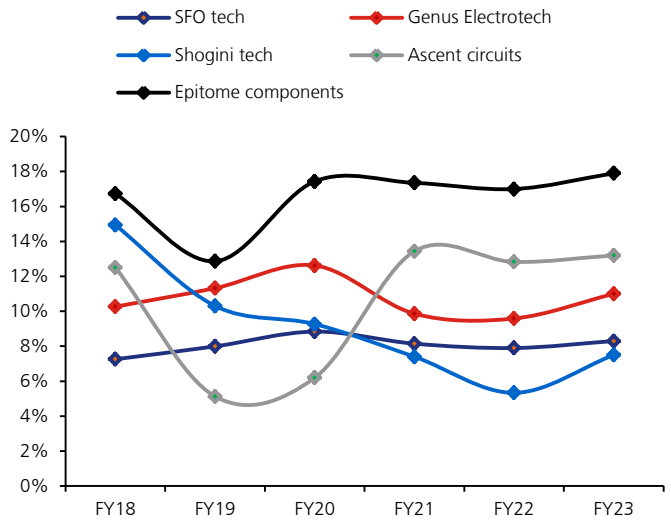
In EMS, companies working with higher volumes lower mix will be operating at a EBITDA margin of 5%-8% vs companies operating in lower volume with higher mix will be operating at a margin range of 10%-15%. However, we expect over next 4-5 years with significant increase in volumes and the industry size the margin range for PCAB companies will be in the range of 10%-12%. We expect companies will move up in the component value chain with increasing focus on component and complex value chain.

Exhibit 8. Listed companies are operating at a margin of 10%-15%.



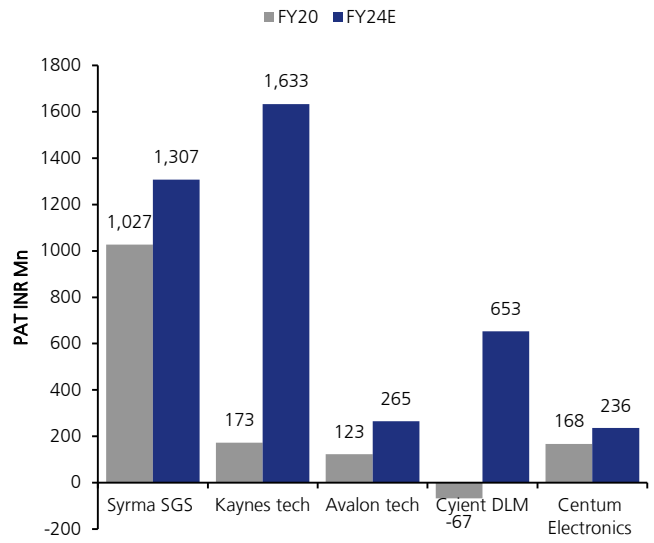
Source: JM Financial, Industry

Exhibit 9. Indian Un-listed companies OPM%



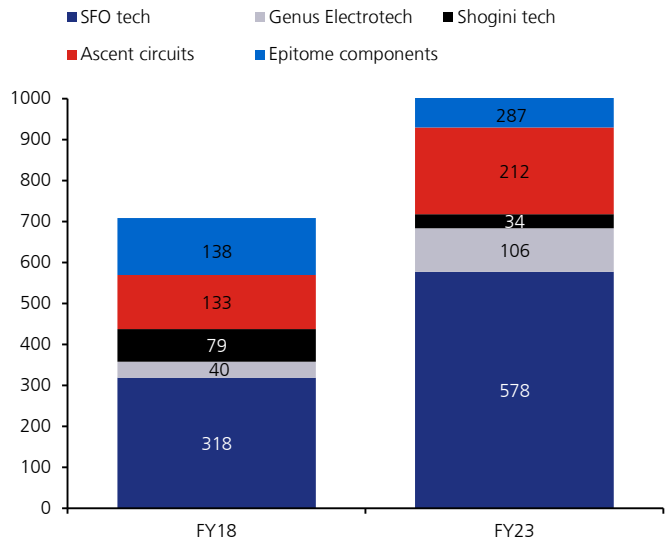
Source: JM Financial, Industry

Exhibit 10. Listed companies PAT



Source: JM Financial, Industry

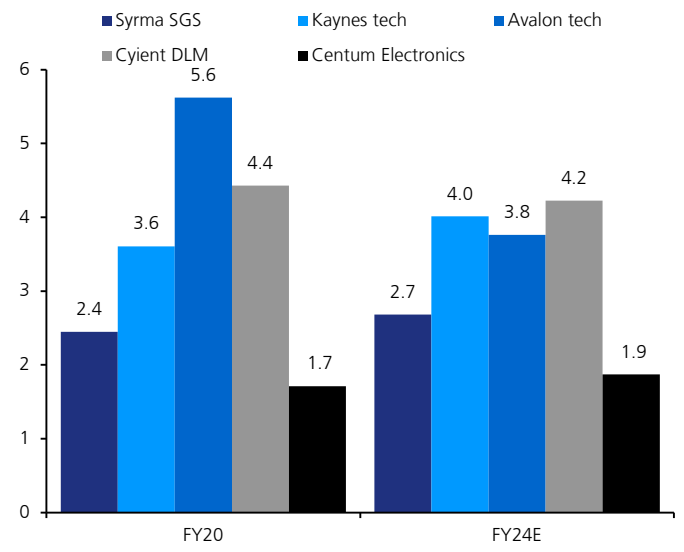
Exhibit 11. Unlisted – India EMS companies PAT



Source: JM Financial, Industry

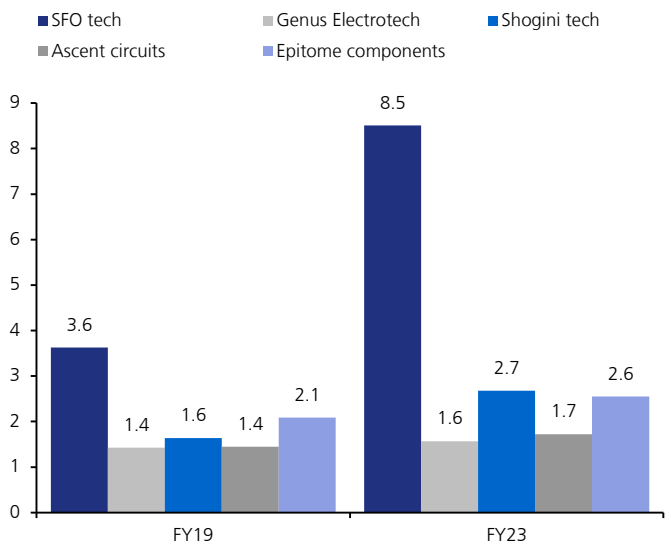
Average Asset/turnover of EMS companies is c.4x.

Exhibit 12. Sales/Gross Block – of Listed companies.



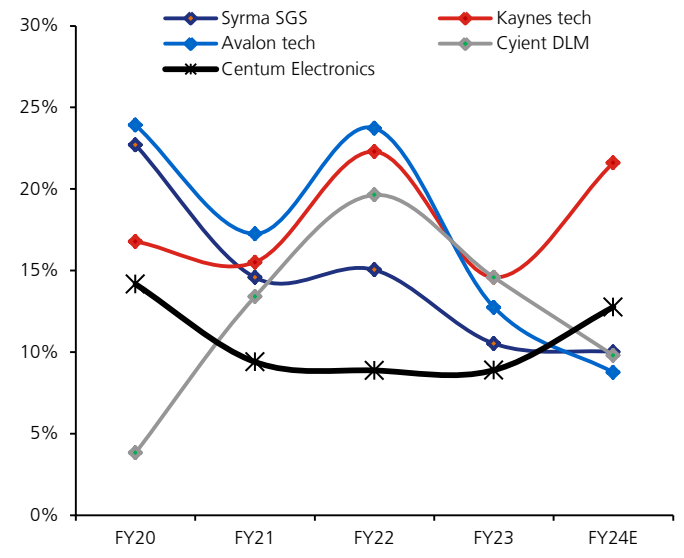
Source: JM Financial, Industry

Exhibit 13. Sales/Gross Block – Unlisted comapaines.



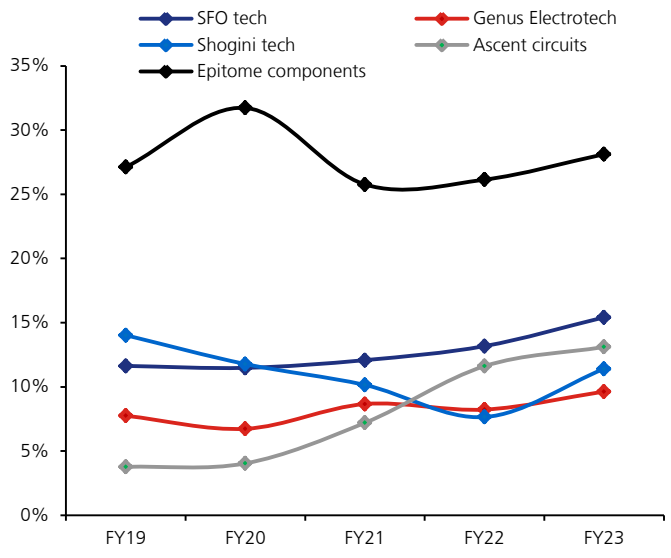
Source: JM Financial, Industry

Exhibit 14. Average ROCE of Listed companies is 15%-20%



Source: JM Financial, Industry

Exhibit 15. Ex. Epitome – average ROCE is 10%.



Source: JM Financial, Industry

Exhibit 16. Indian EMS companies are currently working on high working capital days because of higher inventories

WC-Listed - Days	FY20	FY21	FY22	FY23	FY24E
Syrma SGS	49	70	84	80	75
Kaynes tech	140	133	104	99	98
Avalon tech	66	97	118	138	136
Cyient DLM	139	108	120	138	100
Centum Electronics*	128	138	172	171	164

WC-Unlisted	FY19	FY20	FY21	FY22	FY23
SFO tech	121	154	134	133	131
Genus Electrotech	328	262	204	160	158
Shogini tech	131	106	138	94	97
Ascent circuits	150	174	252	195	178
Epitome components	183	168	233	200	186

Source: JM Financial, Industry Note* centum Electronics is consensus estimate

Exhibit 17. Comparison sheet

Particulars - FY24E (INR Mn)	Kaynes	Syrma	Avalon	Cyient DLM	Indian industry size
Order Book	39,578	54,493	16,769	33,880	
Total Revenue	17,882	29,657	8,562	12,052	8,09,490
Order Book to Bill (x)	2.21	1.84	1.96	2.81	
% of Export Revenue	13%	27%	53%	58%	-
Market Share	2.2%	3.7%	1.1%	1.5%	100%
Industrials - - Order Book	**8,118**	**15,411**	**4,794**	**10,671**	
Revenue	7,967	7,995	2,249	2,074	82,000
Market Share	10%	10%	3%	3%	100%
% of FY24E revenue	45%	27%	26%	17%	11%
Gross Margins % - JMFe	28%	29%	35%	29%	-
Revenue CGAR (FY19-23)	27%	20%	11%	36%	20%
Revenue CGAR (FY23-26E)	86%	31%	15%	44%	19%
Healthcare/Medical - - Order Book	**2,438**	**3,019**	**2,385**	**5,537**	
Revenue	439	2,072	1,136	1,107	46,000
Market Share	1%	5%	2%	2%	100%
% of FY24E revenue	2%	7%	13%	9%	5%
Gross Margins % - JMFe	27%	53%	34%	26%	-
Revenue CGAR (FY19-23)	44%	-4%	8%	16%	25%
Revenue CGAR (FY23-26E)	4%	15%	22%	26%	43%
Consumables and Communication - - Order Book	**4,510**	**15,239**	**1,769**		**NA**
Revenue	861	10,423	1,286		
% of FY24E revenue	5%	35%	15%	0%	
Gross Margins % - JMFe	25%	17%	34%		
Revenue CGAR (FY19-23)	39%	42%	-7%		
Revenue CGAR (FY23-26E)	4%	41%	40%		
Railways - Order Book	**6,580**	**1,480**	**3,295**		**NA**
Revenue	2,027	570	2,042		
% of FY24E revenue	11%	2%	24%	0%	
Gross Margins % - JMFe	33%	17%	39%		
Revenue CGAR (FY19-23)	9%	248%	3%		
Revenue CGAR (FY23-26E)	56%	54%	25%		
Automobiles - - Order Book	**14,150**	**16,635**	**-**		
Revenue	5,349	6,766			1,09,000
Market Share	5%	6%			100%
% of FY24E revenue	30%	23%			14%
Gross Margins % - JMFe	21%	20%			-
Revenue CGAR (FY19-23)	27%	31%			27%
Revenue CGAR (FY23-26E)	27%	56%			28%
Aerospace and Defence - Order Book	**735**			**6,935**	
Revenue	360		155	3,022	71,000
Market Share	1%		0.2%	4%	100%
% of FY24E revenue	2%		1.8%	25%	8%
Gross Margins % - JMFe	26%			17%	-
Revenue CGAR (FY19-23)	40%		-13%	36%	38%
Revenue CGAR (FY23-26E)	74%		25%	48%	38%
Defence				**10,562**	**NA**
Revenue				5,585	
Market Share				NA	
% of FY24E revenue				46%	
Gross Margins % - JMFe				23%	
Revenue CGAR (FY19-23)				14%	
Revenue CGAR (FY23-26E)				32%	
IOT/IT - Order Book	**3,047**	**3,685**			**NA**
Revenue	878.358	854			
Market Share	NA	NA			
% of FY24E revenue	5%	3%			
Gross Margins % - JMFe	30%	11%			
Revenue CGAR (FY19-23)	19%	360%			
Revenue CGAR (FY23-26E)	22%	7%			
Clean Energy			**4,526**		**NA**
Revenue			1,693		
Market Share			NA		
% of FY24E revenue			20%		
Gross Margins % - JMFe			36%		
Revenue CGAR (FY19-23)			32%		
Revenue CGAR (FY23-26E)			5%		

Source: JM Financial, Industry

Exhibit 18. PCBA companies' margins

Particulars (INR mn)	Syrma SGS	Kaynes Tech	Avalon Tech	Cyient DLM
Revenue- FY23	20,484	11,261	9,447	8,320
Revenue Mix (% of Revenue)				
Box Build	**19%**	**30%**	**54%**	**32%**
PCBA/PCB	62%	62%	28%	63%
ODM	18%	3%	2%	NA
Cable Harness	NA	NA	9%	1%
Others	2%	5%	7%	4%
Gross Margin (A)	**25%**	**30%**	**36%**	**22%**
Employee Expenses	5.2%	6.8%	**17.0%**	7.8%
Consumption of Stores & Spares	0.2%	1.9%	0.6%	0.6%
Freight	1.0%	1.4%	1.4%	0.7%
Contract Labour	4.5%	2.3%	0.0%	0.0%
Power & Fuel	0.7%	0.5%	0.7%	0.5%
Others	4.1%	2.2%	4.1%	2.4%
Total Expenses (B)	**15.6%**	**15.2%**	**23.8%**	**11.9%**
EBITDA Margin (A-B)	**9.2%**	**15.0%**	**11.9%**	**10.6%**

Source: Company, JM Financial

Exhibit 19. P&L of listed EMS companies; we expect strong earnings over next 2-3 years

	Revenue (INR Mn)				Revenue CAGR	EBITDA (INR Mn)				EBITDA CAGR	OPM (%)				PAT (INR Mn)				PAT CAGR
Companies	FY23	FY24E	FY25E	FY26E		FY23	FY24E	FY25E	FY26E		FY23	FY24E	FY25E	FY26E	FY23	FY24E	FY25E	FY26E	
Syrma SGS Technology Ltd	20,484	29,657	43,131	58,169	42%	1,878	2,110	3,136	4,889	38%	9.2%	7.1%	7.3%	8.5%	1,231	1,307	2,079	3,398	40%
Kaynes Technologies Ltd	11,261	17,754	26,200	37,508	49%	1,683	2,456	3,547	5,418	48%	14.9%	13.8%	13.5%	14.4%	952	1,587	1,759	2,888	45%
Avalon Technologies Ltd	9,447	8,562	11,474	15,937	19%	1,128	603	982	1,532	11%	11.9%	7.0%	8.6%	9.6%	525	265	601	997	24%
Cyient DLM Ltd	8,320	12,052	16,174	21,590	37%	878	1,105	1,609	2,428	40%	10.5%	9.2%	9.9%	11.2%	317	630	1,025	1,630	73%
Centum Electronics Ltd*	9,230	10,780	12,883	15,751	20%	762	959	1,391	1,827	34%	8.3%	8.9%	10.8%	11.6%	67	236	539	854	134%

Source: JM Financial, Industry Note* Centum electronics is consensus estimate

Exhibit 20. Return ratios to improve over FY25-26 with improvement in asset turnover and margins

Companies	Net Debt (INR Mn)				CFO (INR Mn)				ROCE (%)				ROE (%)				Asset T/o			
	FY23	FY24E	FY25E	FY26E	FY23	FY24E	FY25E	FY26E	FY23	FY24E	FY25E	FY26E	FY23	FY24E	FY25E	FY26E	FY23	FY24E	FY25E	FY26E
Syrma SGS Technology Ltd	2,924	673	1,494	1,040	(703)	599	197	932	10.5	7.9	10.5	14.9	11.7	8.1	11.7	16.6	1.5	1.5	2.0	2.4
Kaynes Technologies Ltd	(3,501)	(15,201)	(7,215)	(5,254)	(419)	1,320	954	1,266	16.5	16.6	13.1	16.7	16.4	15.3	14.6	20.0	1.5	0.9	0.8	0.9
Avalon Technologies Ltd	(1,160)	(1,132)	(946)	(846)	(133)	981	106	171	12.7	5.2	11.1	16.3	16.8	5.2	11.7	16.8	1.5	1.2	1.9	2.5
Cyient DLM Ltd	1,469	(5,118)	(4,933)	(5,637)	521	669	421	1,166	12.4	10.2	9.6	13.5	23.1	10.9	10.1	14.2	1.9	1.4	1.4	1.7
Centum Electronics Ltd	158	(71)	(515)	(1,102)	709	743	1,158	1,280	8.9	12.8	19.9	24.4	3.2	10.1	18.7	22.9	2.1	2.4	2.6	2.8

Source: JM Financial, Industry Note* Centum electronics is consensus estimate

Exhibit 21. Peer comparison - valuation

Companies	Market Cap (INR Mn)	P/E				PEG				EV/EBITDA			
		FY23	FY24E	FY25E	FY26E	FY23	FY24E	FY25E	FY26E	FY23	FY24E	FY25E	FY26E
Syrma SGS Technology Ltd	90,864	75	71	45	27	1.2	11.2	0.7	0.7	51	44	30	19
Kaynes Technologies Ltd	1,65,356	174	115	104	63	2.1	1.4	0.9	1.1	106	68	49	33
Avalon Technologies Ltd	29,499	57	112	49	30	-2.5	-2.2	0.4	0.4	25	47	29	19
Cyient DLM Ltd	62,738	140	106	65	41	-1.3	2.6	0.5	1.0	78	56	38	25
Centum Electronics Ltd*	21,389	320	91	40	25	-2.8	0.4	0.3	0.4	30.5	24.0	16.2	12.1

Source: JM Financial, Industry Note* Centum electronics is consensus estimate

Exhibit 22. JMFe vs consensus estimates

		JMFe			Consensus			Difference		
		FY24	FY25	FY26	FY24	FY25	FY26	FY24	FY25	FY26
Syrma SGS Technology	Revenue	29,657	43,131	58,169	29,963	42,052	56,560	-1%	3%	3%
	EBITDA	2,110	3,136	4,889	2,126	3,315	4,693	-1%	-5%	4%
	PAT	1,307	2,079	3,398	1,351	2,078	3,003	-3%	0%	13%
Kaynes Technology Ltd	Revenue	17754	26,200	37,508	17,506	25,693	36,256	1%	2%	3%
	EBITDA	2456	3547	5,418	2,555	3,819	5,598	-4%	-7%	-3%
	PAT	1587	1759	2,888	1,713	2,458	3,506	-7%	-28%	-18%
Avalon Technology Ltd	Revenue	8,562	11,474	15,937	9,138	11,798	14,999	-6%	-3%	6%
	EBITDA	603	982	1,532	733	1,259	1,806	-18%	-22%	-15%
	PAT	265	601	997	419	868	1,255	-37%	-31%	-21%
Cyient DLM Ltd	Revenue	12,052	16,174	21,590	11,857	16,362	21,035	2%	-1%	3%
	EBITDA	1,105	1,609	2,429	1,121	1,697	2,366	-1%	-5%	3%
	PAT	630	1,025	1,630	611	1,103	1,624	3%	-7%	0%

Source: JM Financial, Industry

Key Risks

- **Raw Material Sourcing:** With the industry heavily reliant on imports for over 50% of its raw materials, it faces susceptibility to geopolitical crises that could disrupt sourcing capabilities and impact profitability.
- **Customer Concentration Risk:** Companies dependent on a limited customer base are vulnerable to adverse consequences if these customers shift to competitors.
- **Freight Rate Sensitivity:** Given the significant revenue generated from exports, companies are highly sensitive to fluctuations in freight rates, which can markedly affect profit margins.
- **Competition Pressure:** Heightened competition due to the industry's large size presents challenges for companies with smaller market shares, potentially jeopardizing their business sustainability.
- **Export Exposure:** Companies with a substantial export share face risks stemming from global inflation, economic downturns, and geopolitical uncertainties.
- **Industry-Specific Slowdown:** Businesses may encounter obstacles if the sectors they serve experience slowdowns, which could have a ripple effect on companies operating within those segments, ultimately impacting their performance.

Kaynes Technology India | BUY

Unlocking value; A story ready to unfold

JM FINANCIAL

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Kaynes is an integrated Electronics System Design and Manufacturing (ESDM) company with promising backward integration capabilities including PCB manufacturing + focused approach to enter the semiconductor value chain by capturing the low hanging opportunity of outsourced assembly and testing (OSAT). It provides conceptual design, process engineering, integrated manufacturing, and life-cycle support for automotive, industrial, aerospace and defence, medical, railways, IoT, IT, and other segments. It has a strategic high-margin low-volume (high-mix) model. It has longstanding relationships with customers and is led by highly experienced promoters.

- **Focus on value addition and high-margin segment:** Kaynes entry into semiconductor value chain and increased product offerings across industries has broadened its target market size to INR 800bn+ for PCBA, INR 1,000bn+ for OSAT and INR 300bn+ for PCB in FY24. Additionally, it is able to enjoy industry leading margins because of its process engineering + customer mix.
- **Long standing relationship + strong customer base:** Kaynes has gained expertise in complex sub-assemblies, which has resulted in strong customer relationships, customer stickiness and a competitive edge. Its average relationship with top-10 customers is 7+ years and with not more than 15% revenue from a single customer, its core focus stays on customer de-risking and value addition.
- **Domestic remains core, export to be capitalised:** Kaynes derives c.85% of its revenue from the domestic market vs c.50% for peers. We expect in domestic market with government's "Atmanirbhar Bharat" theme sector like automobiles and industrials, while in export aerospace and railways will drive the growth.
- **Strong order book visibility for PCBA:** Order book saw a meteoric 96% CAGR over FY20-23; 9MFY24 order book stands at c.INR 37.9bn (2.5x TTM rev.), providing strong revenue visibility. It is likely to double its current SMT lines to 20+ over the next 2 years.
- **Backward integration:** Kaynes entry into OSAT + backward integration into PCB manufacturing + Govt. boost for component eco-system shall prove to be earnings accretive and shall enhance return ratios. For OSAT, Kaynes has already tied up with three global players and we expect significant contribution to flow in from FY27.
- **M&A – for inorganic growth:** Strategic acquisitions will continue, which will complement its scale of operations, segments, and help it expand into newer geographies.
- **We initiate with BUY with TP of INR3,410:** We expect the company's revenue/EBITDA/PAT CAGR of c.49%/48%/45% over FY23-26 with OPM of 13.5%/14.4% in FY25/FY26 and earnings growth of c.11%/64% in FY25/26. Based on strong financials, improved RoCE/RoE of c.12.4%/9.7% in FY26, and better working capital visibility, we initiate coverage with a BUY rating and a target price of INR 3,410, - upside 20% from CMP (EMS: 2,269, P/E 45x + PCB: 277, P/E 30x + OSAT: 865, P/E 35x).

Recommendation and Price Target	
Current Reco.	BUY
Previous Reco.	
Current Price Target (12M)	3,410
Upside/(Downside)	19.5%
Previous Price Target	NA
Change	NA

Key Data – KAYNES IN	
Current Market Price	INR2,854
Market cap (bn)	INR182.4/US$2.2
Free Float	41%
Shares in issue (mn)	63.9
Diluted share (mn)	63.9
3-mon avg daily val (mn)	INR450.7/US$5.4
52-week range	3,000/858
Sensex/Nifty	73,143/22,213
INR/US$	82.9

Price Performance			
%	1M	6M	12M
Absolute	-0.8	43.8	209.2
Relative*	-4.1	27.6	151.3

* To the BSE Sensex

Financial Summary					(INR mn)
Y/E March	FY22A	FY23A	FY24E	FY25E	FY26E
Net Sales	7,062	11,261	17,754	26,200	37,508
Sales Growth (%)	67.9	59.4	57.7	47.6	43.2
EBITDA	938	1,683	2,456	3,547	5,418
EBITDA Margin (%)	13.3	14.9	13.8	13.5	14.4
Adjusted Net Profit	418	952	1,587	1,759	2,888
Diluted EPS (INR)	9.0	16.4	24.8	27.5	45.2
Diluted EPS Growth (%)	98.2	81.1	51.7	0.9	64.1
ROIC (%)	18.6	23.6	165.8	183.1	30.7
ROE (%)	24.5	16.4	15.3	14.6	20.0
P/E (x)	315.6	174.3	104.6	103.7	63.2
P/B (x)	65.1	17.3	14.8	14.0	11.5
EV/EBITDA (x)	196.4	106.4	68.2	49.5	32.7
Dividend Yield (%)	0.0	0.0	0.0	0.0	0.0

Source: Company data, JM Financial. Note: Valuations as of 23/Feb/2024

JM Financial Research is also available on:
Bloomberg - JMFR <GO>,
Thomson Publisher & Reuters,
S&P Capital IQ, FactSet and Visible Alpha

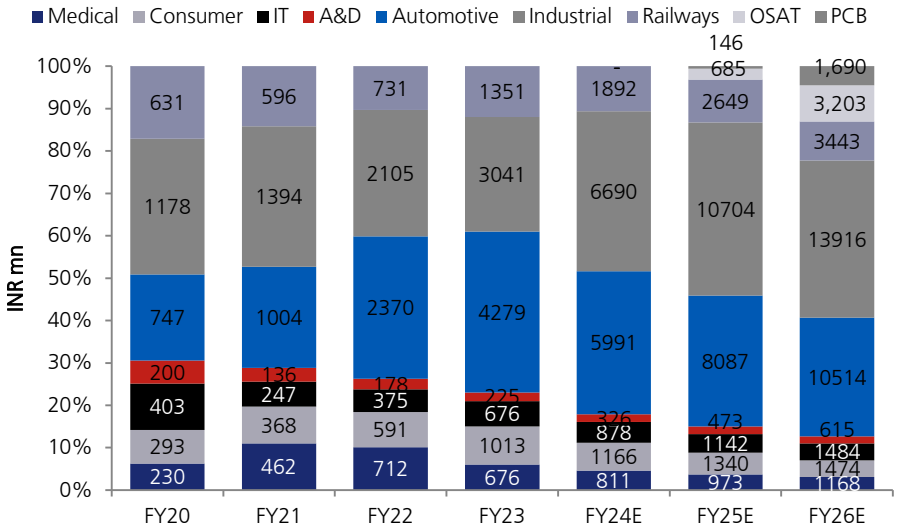
Please see Appendix I at the end of this report for Important Disclosures and Disclaimers and Research Analyst Certification.

Diversified end-user industries base

Kaynes caters to various industries, which limits its exposure to a downturn in any one industry vertical. Most of the industries it caters to are on a high-growth trajectory, led by supply-chain diversification by global giants, increased government spending, and pick up in private capex. Kaynes is also entering into new emerging industries such as electric vehicles, in which electronics usage is much higher than other types of vehicles. We expect strong growth for EMS players due to increasing electronics content in these industries.

Its varied client base provides access to a larger market, protects it from industry-specific downturns; in addition, it has a sharp focus on the high-margin segments

Exhibit 1. How the revenue mix is expected to shape up in the coming years – we expect significant contribution from OSAT + PCB to flow from FY27/28



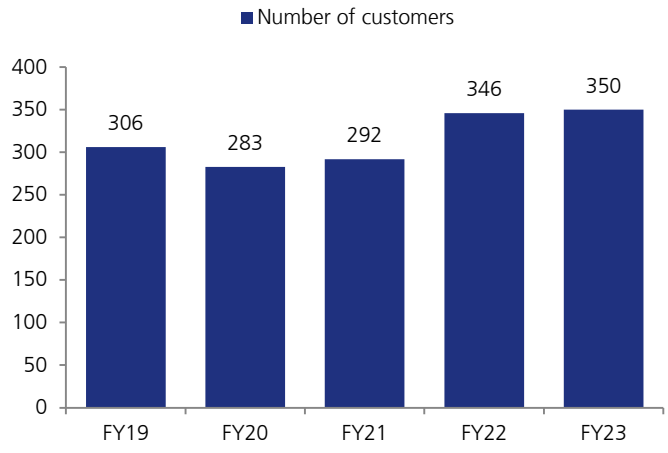
Source: Company, JM Financial

Diversified client base protects it from adversity

Kaynes has 350+ customers across 26 countries. There is a balanced mix of Fortune 500 companies, MNCs/leading domestic brands and start-ups, which shows how diversified the customer base is. It will continue to grow this base, easing its dependence on any one industry vertical or on a few customers, which will safeguard its business operations from adverse effect of a customer- or industry-specific downturn or disruption. Kaynes is one of the few EMS companies with such a large customer base and such low customer concentration.

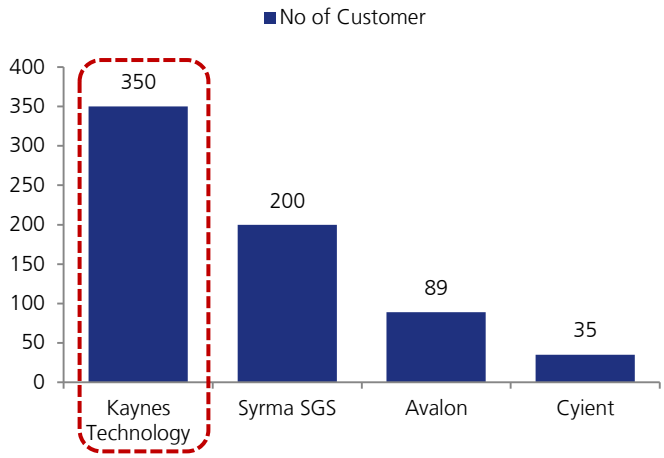
Over FY20-23, major growth was driven by automotive, industrials and railways. These segments will continue to drive revenue growth in coming years along with Aerospace and defence

Exhibit 2. Kaynes continues to see steady growth in its customer base



Source: Company, JM Financial

Exhibit 3. Kaynes has the highest number of customers amongst peers



Source: Company, JM Financial

Exhibit 4. Kaynes' key customers

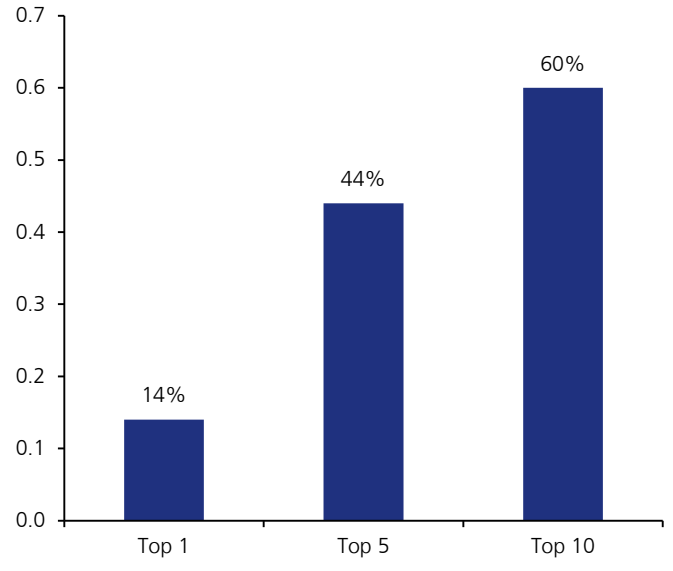
Particulars	Build to print / HLA	Sub assembly / Box build	ODM
Revenue Contribution (FY22)	63%	28%	4%
Key customers (relationship of 5+yrs)	SIEMENS, L&T, Landis+Gyr, HITACHI, Schneider Electric, TRANSASIA, FRAUSCHER, KONE	AGAPPE, LEACH, ALSTOM, Möhlenhoff, CORHAM, SKANRAY, HCL, stryker	TATA COMMUNICATIONS, Lucas-TVS Limited, HAVELLS
Key customers (relationship of 3-5yrs)	intel, rotork, CYPRESS	KAVO, ottomate, TONBO imaging	iskraemeco, Infosys, adani, orient electric, OASIS
Key customers (relationship of <3yrs)	CHELTON, EATON, NOVA, Honeywell, KOSTAL, ABM, JOHNSON ELECTRIC	AMETEK, boAt, TATA COMMUNICATIONS, Beat	
Illustrative applications	Signalling system, switchgear & metering, etc.	Auto lamps, room thermostat Semi - auto analysers for blood chemicals & process, etc	Bluetooth based lighting solutions convertor for naval submarine, Robotic & dispensing solutions etc

Source: Company, JM Financial

Revenue concentration of customers is not too high

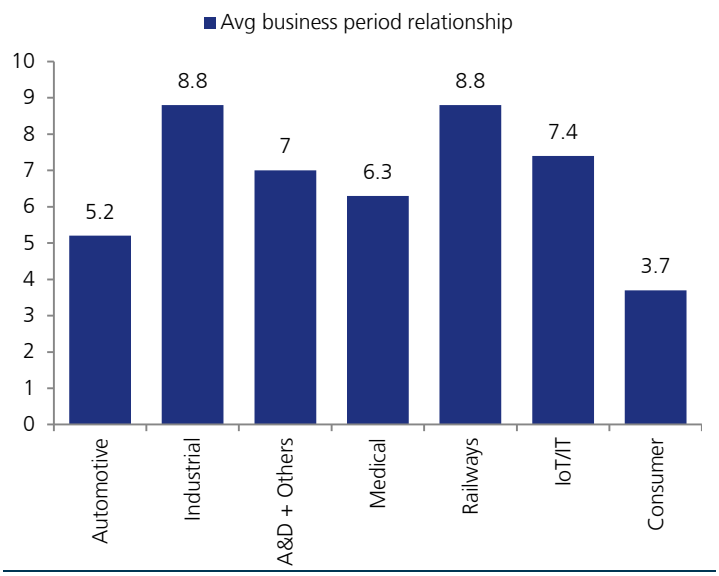
None of Kaynes' customers contribute more than 15% of its overall revenue, so its sales will not be majorly adversely affected if business from any customer stops. The top-10/top-5 customers of the company accounted for c.60%/44% of FY23 revenues. We expect customer concentration to further reduce in future.

Exhibit 5. Kaynes has low customer concentration due to customer diversification



Source: Company, JM Financial

Exhibit 6. Kaynes has longstanding relationships with its customers, with an overall average relationship of 7+ years



Source: Company, JM Financial

Kaynes will thrive in India's increasing domestic focus, emerging industries growth

India is a priority market for Kaynes, which is not surprising, considering significant traction in industries such as railways, EVs, industrials, and automotive (which incidentally contribute the maximum to its revenue) led by increasing government efforts towards more localisation as well as higher infrastructure spending and pick-up in private capex. These sunrise industries are undergoing major changes in terms of technology and upgradation. We believe that adoption of newer technologies and increasing electronics usage in products will boost demand for EMS players such as Kaynes. India is on its way towards becoming a developed economy, and the share of manufacturing in overall GDP should see a significant increase – just like what happened to the information technology industry 2 decades ago. Kaynes is in a sweet spot to capitalise on this opportunity.

It started exporting sensor electric assemblies to Phoenix, Arizona, in FY21 and saw strong growth momentum in aerospace, defence, and power electronics

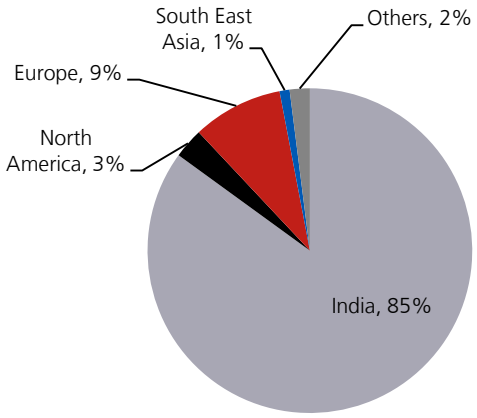
Exhibit 7. Kaynes has strong domestic customer base and developing export base well

Segment	Domestic	International
Automotive	67	5
Industrial	161	24
Aerospace & Defence	19	2
Medical	23	5
Railways	8	4
IoT	16	7
Consumer	6	1
Total	**300**	**48**

Source: Company, JM Financial

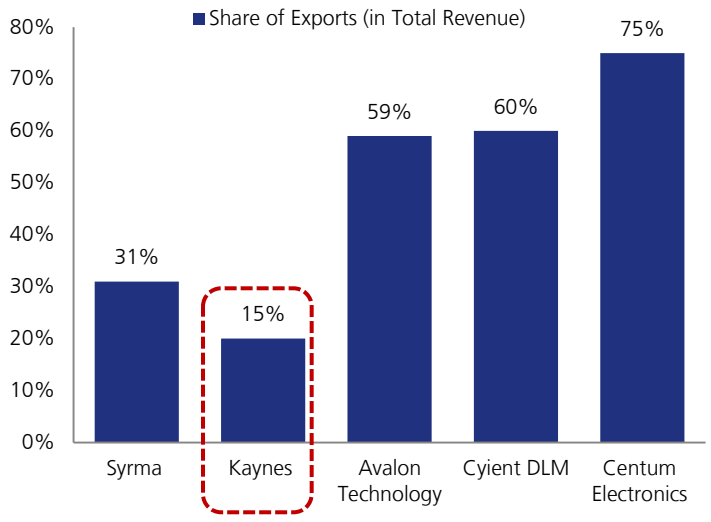
Kaynes' exposure to exports is lower than that of the other listed players

Exhibit 8. Kaynes derives maximum revenue from India



Source: Company, JM Financial

Exhibit 9. Kaynes has lowest share of exports amongst peers



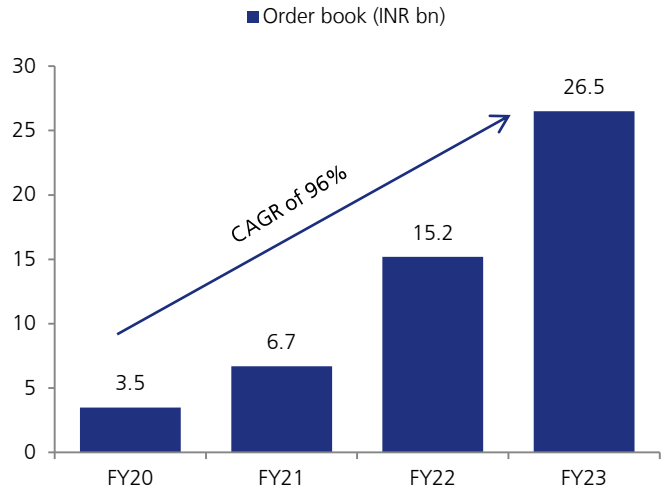
Source: Company, JM Financial

Order book growing exponentially, with rise in order value, proving capabilities

Kaynes order book soar to INR 26.5bn in FY23 from INR 3.5bn in FY20 with an increase in average order value, which proves its execution capabilities. With new customers coming on board, and rising wallet share with existing customers, Kaynes will continue to see strong order book build up in coming years, which will provide revenue visibility. Kaynes will benefit the most from the following: (1) its high domestic presence (almost 85% of its revenues comes from the domestic markets), (2) capacity expansion across industries in India, and (3) uptick in industries such as automotive, industrial, railways, aerospace, and defence. It has received approval under the PLI for white goods and telecom products.

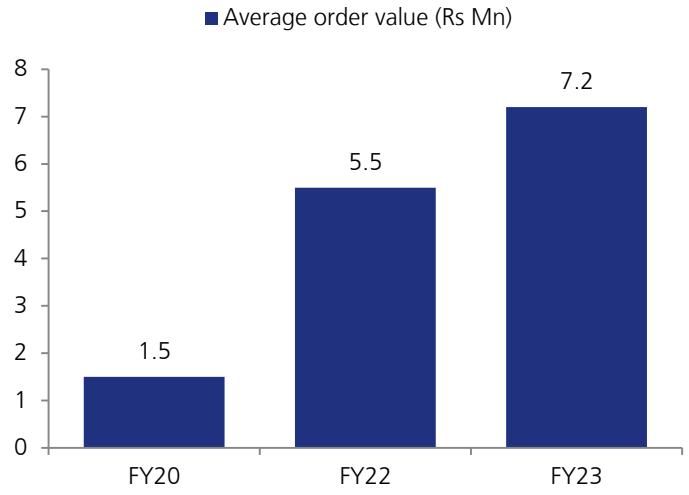
Kaynes has seen significant order book growth, driven by execution capabilities, new customer acquisition, and expansion in domestic markets. PLI approval and industry uptick will drive growth

Exhibit 10. Order book has seen a sharp jump over the years; order inflow to see CAGR of 22% over FY24-26



Source: Company, JM Financial

Exhibit 11. Average order value has increased almost 5x in the last 3 years



Source: Company, JM Financial

From EMS to value-added ODM expertise

With over 3 decades of experience, Kaynes has gained technological expertise and transformed from an EMS provider to a design-led manufacturer providing value-add ODM services. Kaynes has leveraged upon its capabilities of in-house design and R&D team to strengthen its ODM capabilities.

Kaynes was focused on becoming an integrated EMS player, and is now keen on increasing its ODM share

Exhibit 12. Kaynes continues to see strong growth from ODM offerings

(INR mn)	FY19	FY20	FY21	FY22	FY23E	FY24E	FY25E
ODM revenues	142	76	184	278	338	568	863
as a % of revenues	3.9%	2.1%	4.4%	3.9%	3.0%	3.2%	3.4%

Source: Company, JM Financial

Exhibit 13. In-house ODM capabilities developed by the company

Products	Vertical	Description
Smart meters	Industrial	Supported a European customer with design and qualification of smart meters suitable for Indian standards
Home diagnostic products	Medical	Start-up entering into at-home diagnostics markets. Kaynes undertook the design, prototype and bulk manufacturing
Streetlight controllers	IoT/IT	Kaynes designed and developed a street light controller with a built-in energy meter. Product qualified for reliability and taken up for bulk manufacturing, including exports
IoT appliance	Consumer	Support in IoT-driven smart solution for appliances. Handled design, prototype, and currently doing bulk manufacturing
Consumer audio	Consumer	Supported a customer looking at localizing CKD unit manufacturing through assembly of SKD unit

Source: Company, JM Financial

Focused on getting larger revenue share from OEMs, Box builds for better margins

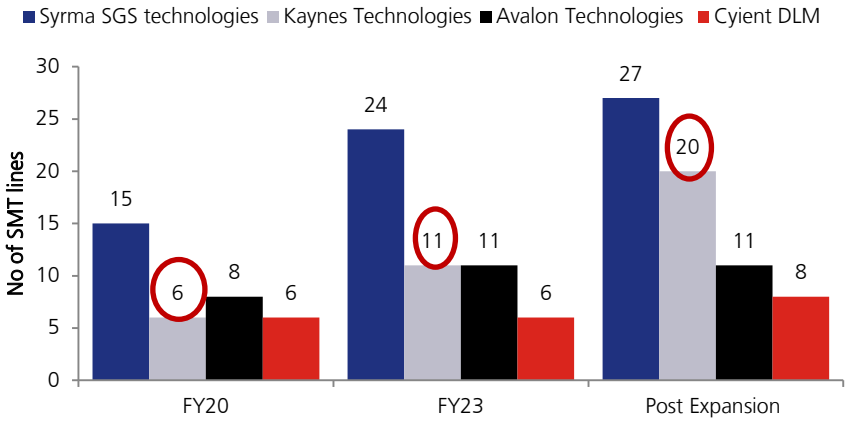
As an ESDM player, Kaynes focuses on catering to OEMs and ensures more customers with larger revenue share by providing the following: (1) in-house building of test fixtures, (2) product reliability at closer proximity with faster turn-around times, (3) complex prototypes in shorter lead times and setting up product- or Box-build manufacturing facilities with zero defects. It provides almost all services in-house – from electronics to tooling, sheet metal, magnetics, cable harness, and test benches. This increases the share of Box builds, which will positively impact revenue and margins.

Capex for upgrading and expanding existing facilities, making new ones

Kaynes will set up a new manufacturing facility in Chamarajnagar, Karnataka (Phase I of Chamarajnagar facility is partly operational and phase II is under construction), and expand manufacturing facilities in Mysuru and Manesar. Also, it is setting up an OSAT facility at Kongara Kalan, Telangana, and is in the process of preparing an implementation plan for a PCB fabrication facility in Mysuru, Karnataka, that will manufacture advanced HDI PCBs.

Its planned capex will allow it to build a high value-added consumer electronic product portfolio, and expand its business with customers for full Box builds

Exhibit 14. Kaynes will add nine SMT lines over next 2 years



Source: Company, JM Financial

Focus on backward integration – PCB + OSAT

Kaynes has recently announced that it will backward integrate into PCB manufacturing and OSAT operations. We believe this move will re-rate Kaynes due to (1) c.75% of cost incentive will be provided by governments (2) upcoming favourable policies for component manufacturing like SPECS 2.0 and expectations of import duty on PCB (3) opening of export opportunity for packaged chips (4) cost optimisation leading to margin accretion. Kaynes has been the only EMS player to backward integrate into component manufacturing, which, we believe, will be the next big theme in India. We expect significant contribution from these new opportunities to flow in from FY27/28.

Exhibit 15. Backward integration into OSAT and Bare PCB manufacturing

Source: Company, JM Financial

Strategic benefits:

- **Vertical Integration:** (1) Integrated offerings to customers with OSAT and PCB fabrication capabilities (2) Greater cost efficiencies and better quality control.
- **Supply Chain & Future Market Readiness:** (1) Greater supply chain resilience (2) Reduced vulnerabilities of key component availabilities
- **Better Customer Proposition:** (1) Ability to offer customers a one-stop solution for their Electronic Products/ Modules manufacturing needs (2) Competitive pricing to customers underpinned by better supply chain efficiencies

Execution plan:

1. **Printed Circuit Board (PCB) manufacturing:**

The proposed project will have manufacturing capabilities of Advanced HDI (High Density Interconnect) PCBs. HDI PCBs are the key driving factor behind the reducing size and weight of consumer electronic products while improvising the speed, performance and power consumption. They provide designers with the freedom to design and place more components on both sides of the PCB.

HDI enables packing of all functions in one board rather than using several boards as in standard PCBs. This results in reducing the size and overall costs compared to the traditional PCBs.

The facility – near Mysuru, Karnataka, spread across 20 acres of land – is where Kaynes proposes to do up to 10 layers of PCB manufacturing. The total cost of the project to be c.INR 13.9bn (Equity - INR 3bn and balance as government incentive in pari passu basis).

2. **Outsourced Assembly and Testing (OSAT) Facility:**

The proposed facility near Hyderabad, Telangana, spread across 46 acres will consist of 12 OSAT lines. Kaynes will focus on three types of low to medium end packaging – (1) Quad flat no-lead (QFN) package – used in programmable modules and microcomputers (computing equipment) (2) Flip chip ball grid array (FCBGA) package – used in telecommunication equipment, mobiles, laptops, desktops servers, automotive industry for ADAS and infotainment functions (3) Global small outline transistor (SOT) packaging – used in consumer electronics products.

An application has been filed with India Semiconductor Mission (ISM) and the company has received state approvals. The first line as proof of concept will commence from Apr'24. The total cost of the project is c.INR 28.5bn (Equity - INR 7.6bn and balance as government incentive in pari passu basis).

Ponni Tech is experienced in OSAT and has expertise of development and manufacturing in multiple semiconductor applications, including Automotive, Power, RF, Memory, LED, Solar, Micro-Controller and Sensor

The company has signed an MoU with three global companies for developing OSAT capabilities - (1) Globetronics technology BHD, Malaysia as a technology partner (2) Ponni tech, Malaysia as an execution partner (3) Aptos technology, Taiwan for training and knowhow authorisation.

Exhibit 16. How we look at OSAT business shaping over next 4-5 years

OSAT assumption (INR mn)	FY25	FY26	FY27	FY28	FY29	FY30
Total Revenue	685	3,203	8,331	11,575	14,274	16,119
Operating profit	(31)	501	1,670	2,330	2,887	3,276
OPM (%)	-5%	16%	20%	20%	20%	20%
Subsidy amortization - Other Income	242	604	1,052	1,366	1,497	1,572
EBITDA + OI	211	1,105	2,722	3,696	4,384	4,848
EBITDA %	31%	34%	33%	32%	31%	30%
Profit / (Loss) after tax	(279)	(72)	673	1,170	1,599	1,860

Source: JM Financial, Industry

Exhibit 17. How we look at PCB business shaping over the next 4-5 years

PCB INR mn	FY25	FY26	FY27	FY28	FY29	FY30
Revenue	146	1,690	3,340	6,281	8,502	10,697
Operating Profit	(13)	288	668	1,256	1,709	2,166
OPM (%)	-9.0%	17.0%	20.0%	20.0%	20.1%	20.3%
Subsidy amortization – Other income	132	266	356	480	574	629
EBITDA	119	554	1,025	1,737	2,283	2,796
EBITDA Margin (%)	81.3%	32.8%	30.7%	27.6%	26.9%	26.1%
Profit / (Loss) after tax	(392)	(262)	(20)	174	535	928

Source: JM Financial, Industry

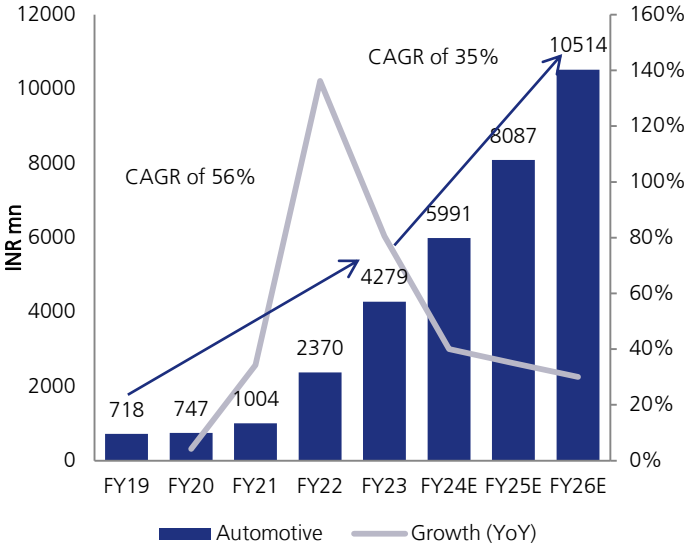
Segment-wise analysis

Automotive, 38% of revenue: Riding on lighting and controllers

The segment is seeing higher demand for value-added products. Kaynes is gaining wallet share in this segment and onboarding new customers. It has established itself as a major supplier to OEMs for electronics in automotive lighting, passive entry passive start, Electronic Control Units (ECUs), door switches, clusters, sensors, convertors, etc. We expect Kaynes to see 35% CAGR in automotive over the next 3 years with strong order book at INR 14.2bn/17.4bn/19.7bn in FY24/25/26, and better margins due to increase in share of Box builds.

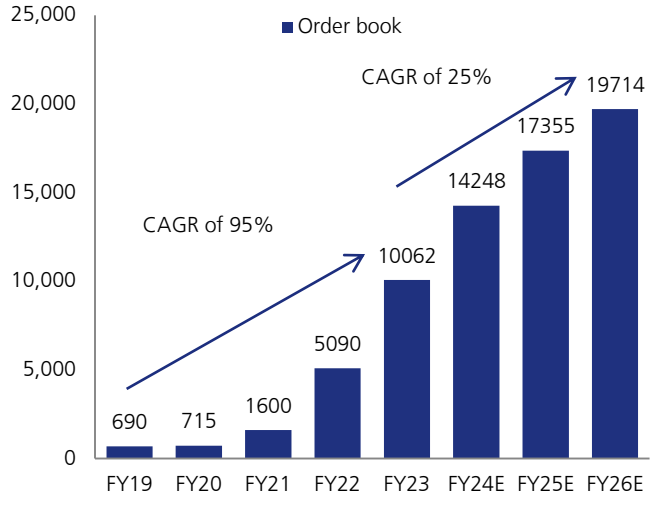
In auto – India Japan Lighting (IJL) is a major client; Revenue size of IJL has grown at a CAGR of c.15% over FY13-22. IJL revenue in FY22 was INR 8.7bn

Exhibit 18. Automotive segment CAGR of c. 35% over FY23-26



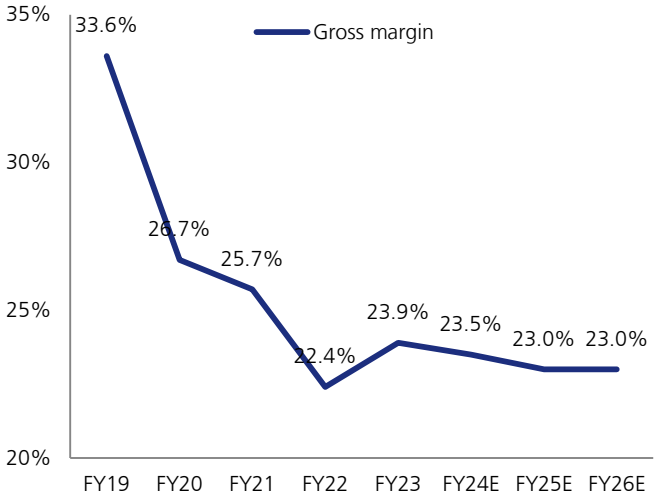
Source: Company, JM Financial

Exhibit 19. We see auto order book CAGR of 25% over the FY23-26



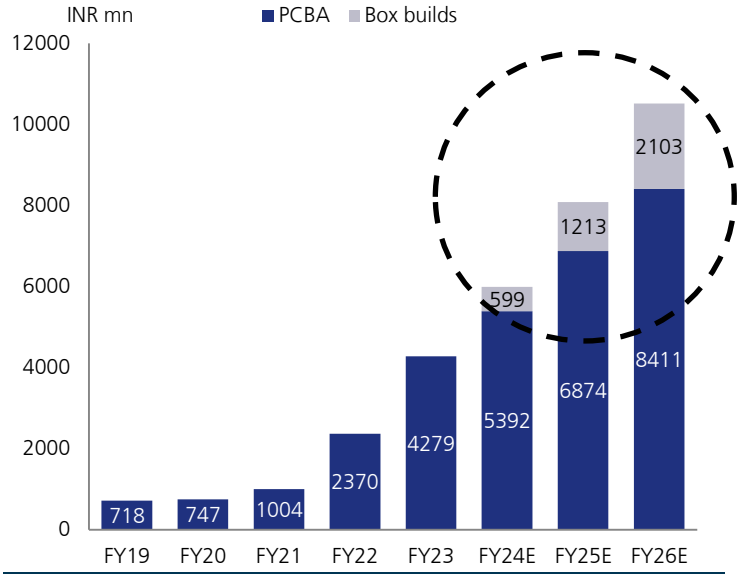
Source: Company, JM Financial

Exhibit 20. Kaynes automotive segment gross margin trend



Source: Company, JM Financial

Exhibit 21. Share of box builds to increase in FY24/25/26



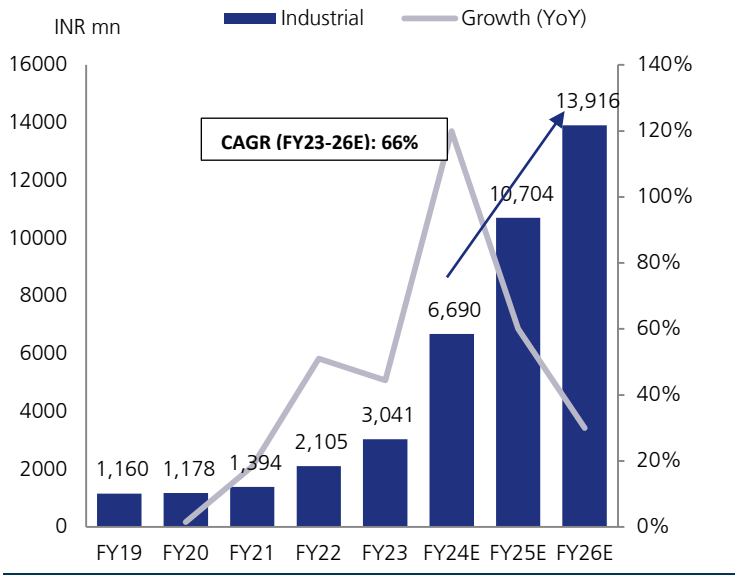
Source: Company, JM Financial

Industrial, 27% of revenue: Strong EV growth, big smart-meter opportunity

- **EVs:** Kaynes expects significant growth in industrials, driven by electric vehicles. Kaynes has started manufacturing for leading four-wheeler brands and contributed c.10% of BOM of that company's product. The company recently completed production audits with a large European customer to whom it will start exporting EV chargers.
- **Smart meters:** It intends to use its relationships with customers in power electronics and instrumentation to gain higher wallet share in smart meters.
- We expect strong revenue CAGR of 66% over the next 3 years from this segment and revenue of INR 6.7bn/10.7bn/14bn with order inflow of INR 8.5bn/11.9bn/15.4bn in FY24/25/26.

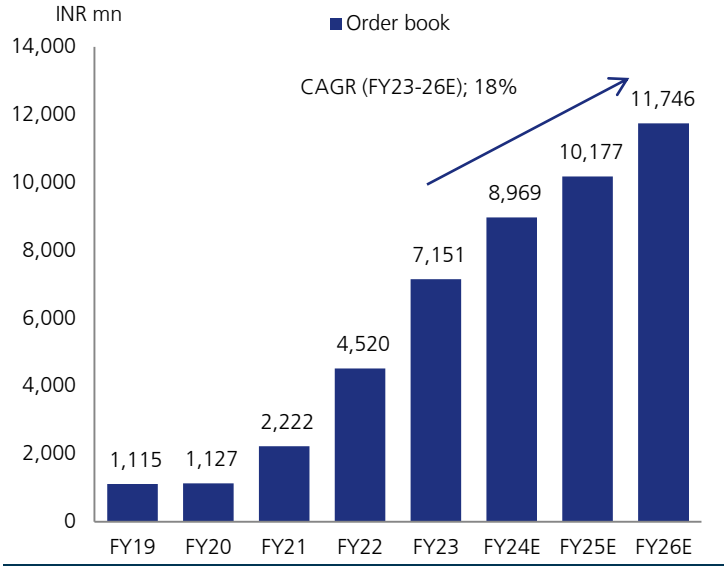
Key products for Kaynes – HVAC thermostats, smart meters, street-light controllers, precision bridge and strains, and EV components chargers.

Exhibit 22. Industrials' revenue CAGR of 66% in 3 years with significant increase in share of EVs



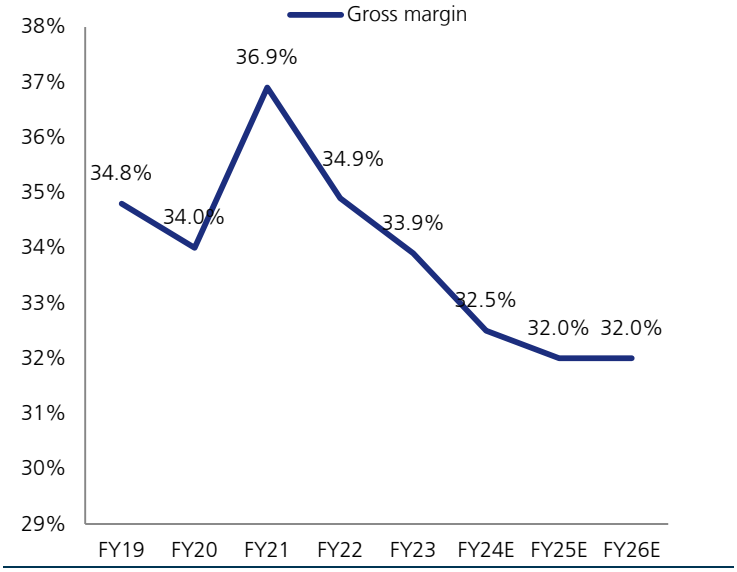
Source: Company, JM Financial

Exhibit 23. Order inflow to see strong going ahead – 18% 3-year CAGR; growth majorly from EVs and smart energy meters



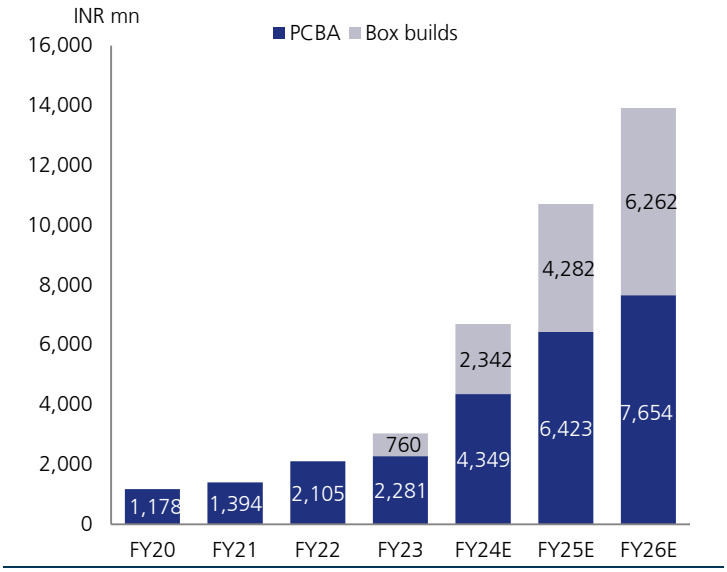
Source: Company, JM Financial

Exhibit 24. On conservative estimates we expect lower margins; however, with increasing share of Box build, margins to improve



Source: Company, JM Financial

Exhibit 25. Increasing share of Box builds in overall revenue; we expect Box build revenue to contribute 45% of industrial by FY26



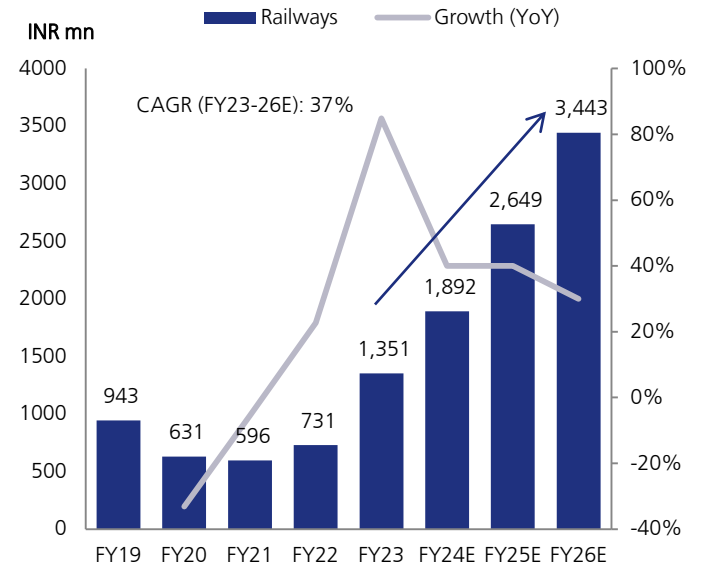
Source: Company, JM Financial

Railway, 12% of revenue; strong railway capex: Kaynes tapping 'signalling' for higher margins

Kaynes intends to tap into installation and maintenance of electronics equipment, branch out to traction electronics, onboard electronics, rolling stock lighting and information systems. It will also look to strengthen market share in signalling, and explore potential strategic acquisitions, thus bringing new-gen technologies into India in passenger safety, passenger comfort and internet connectivity. The entire business is mostly Box builds for this segment, which provides higher margins. A higher budgetary outlay and increased traction in the railways space will help the company increase its order book to INR 11bn by FY26; we expect 3-year revenue CAGR of 37% in this segment.

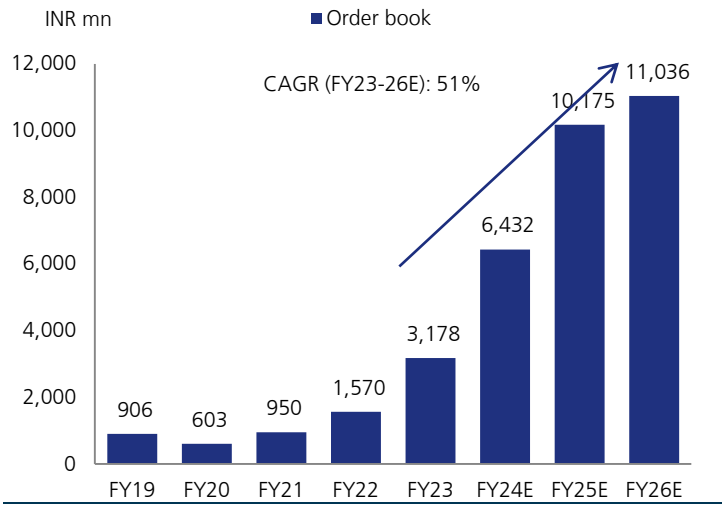
Kaynes plans to strengthen share in signalling by offering installation, maintenance, and new-gen technologies. It aims to increase its order book and revenue in this segment

Exhibit 26. Railways will see revenue CAGR of c.37% over FY23-26



Source: Company, JM Financial

Exhibit 27. Order inflow of INR 3.3bn/3.7bn/4.3bn in FY24/25/26, present order book-to-bill at 0.4x

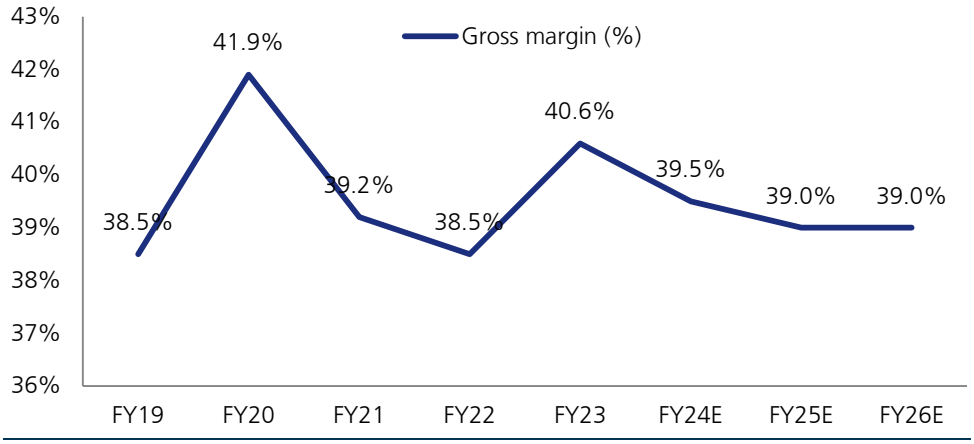


Source: Company, JM Financial

Kaynes key achievements in signalling

- Besides being a manufacturer of Passenger Information Systems for a Canadian-based OEM, Kaynes is also an authorised vendor for repairs for Delhi Metro Rail Corporation.
- It is approved by Chittaranjan Locomotive Design centre for restoration of three-phase locomotive electronics.
- Indian railway is developing and creating technology in areas such as signalling and telecommunication, to be tailored with 'KAVACH', the locally developed Train Collision Avoidance System for a target of 37,000 km by 2026.

Exhibit 28. Gross margin trend for Kaynes' railway segment

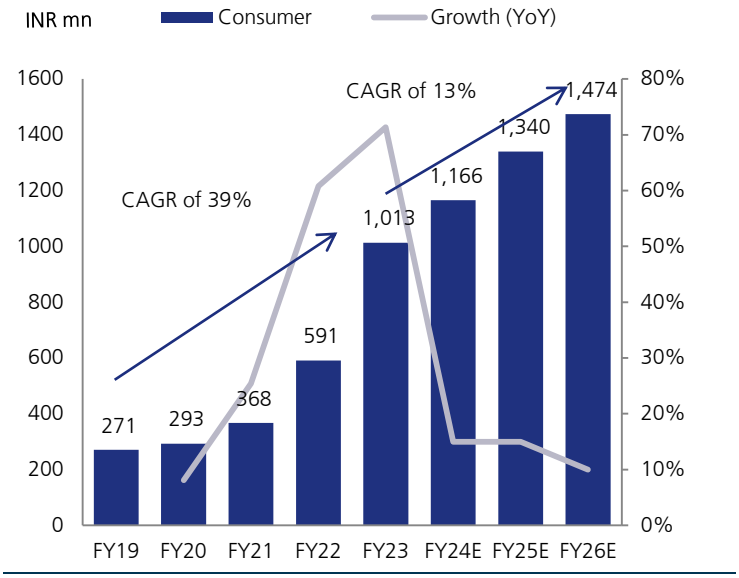


Source: Company, JM Financial

Consumer, 9% of revenue: Greater focus on higher-margin segments

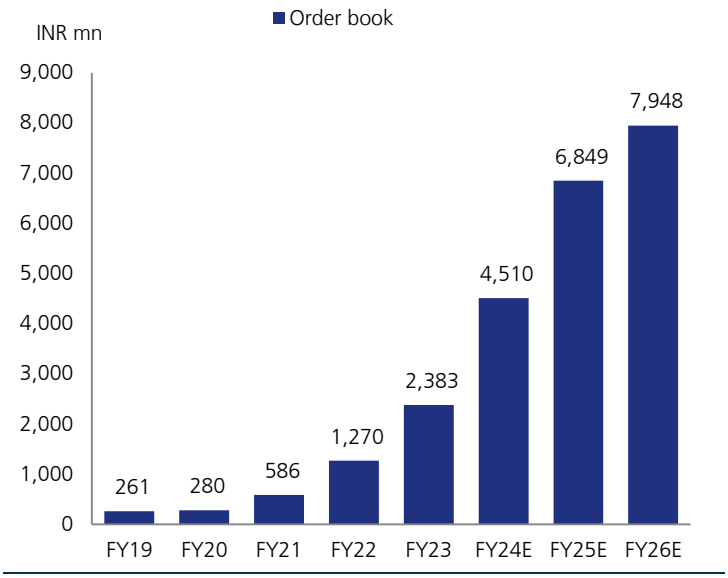
- **Personal-electric devices:** Kaynes will solidify its position in personal-electric devices such as consumer radios, wearables, lighting components and controls, and components for consumer appliances.
- **Focus on Box-build solutions, which typically command higher margins:** It has capabilities in providing full Box-build solutions, including PCBAs, plastic injection moulding and wiring and metal fabrication – which will help its customers localise their manufacturing vs. being dependent on international vendors earlier.
- **Projections:** We expect revenue of INR 1.2bn/1.3bn/1.5bn in FY24/25/26 from consumer electricals and order inflow of INR 2.1bn/2.3bn/2.6bn in FY24/25/26.

Exhibit 29. Consumer segment will see revenue CAGR of 13% (FY23-26)



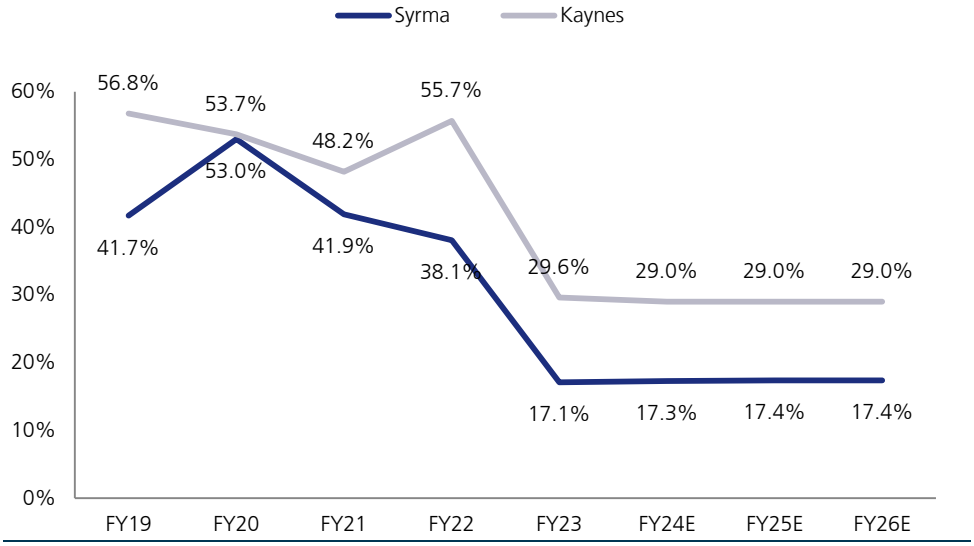
Source: Company, JM Financial

Exhibit 30. In this segment, major orders will come from wearables, consumer appliances, lighting, etc.



Source: Company, JM Financial

Exhibit 31. Product mix helped Kaynes garner higher GM in consumer segment vs. peers

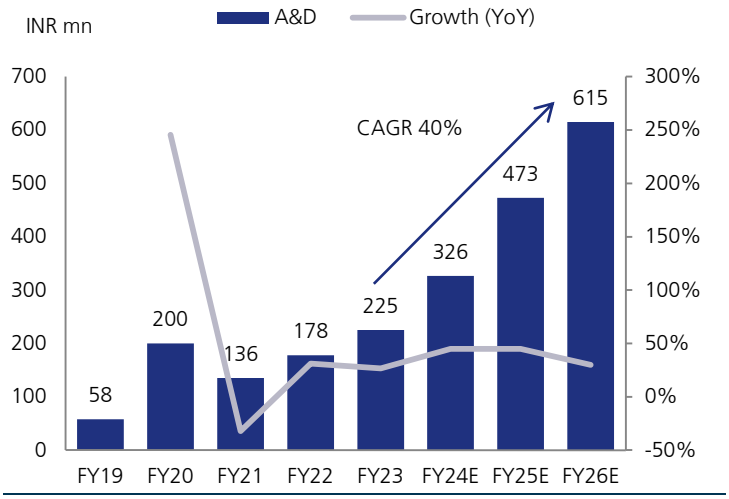


Source: Company, JM Financial

Aerospace & defence, 2% of revenue: Making big strides in this segment

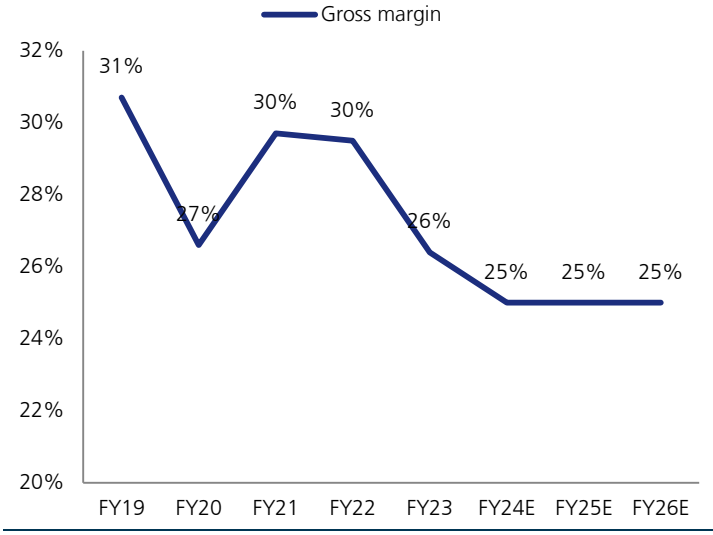
- Kaynes will set up infrastructure and develop skills to address complex avionics assembly and testing.
- By focusing on key customers and emerging as a key system integrator it will gain wallet share and move up the value chain to manufacture complex products for space electronics.
- Qualified as an aerospace OEM for a long-term contract worth INR 350mn.
- We expect 40% revenue CAGR from this segment over the next 3 years with revenue at INR 326mn/473mn and order book of INR 762mn/1,099mn in FY24/25.

Exhibit 32. A&D to see revenue CAGR of c. 40% over the next 3 years



Source: Company, JM Financial

Exhibit 33. Gross margin in A&D segment to stabilise at 25%

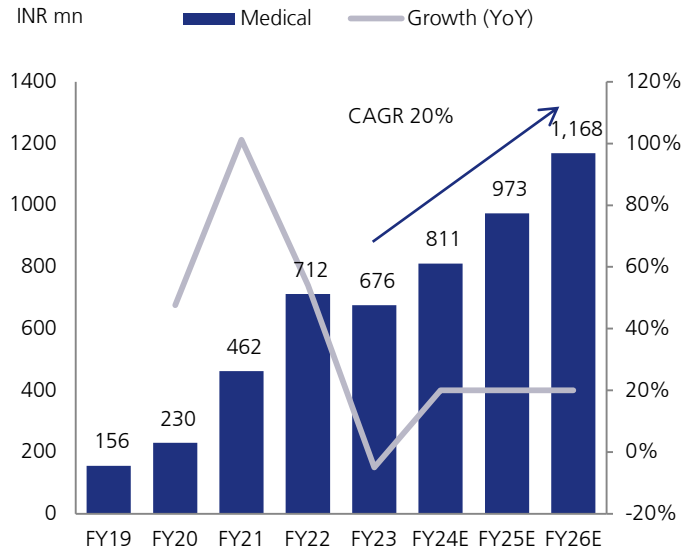


Source: Company, JM Financial

Healthcare, 6% of revenue: Rising presence in high-end diagnostics and start-ups

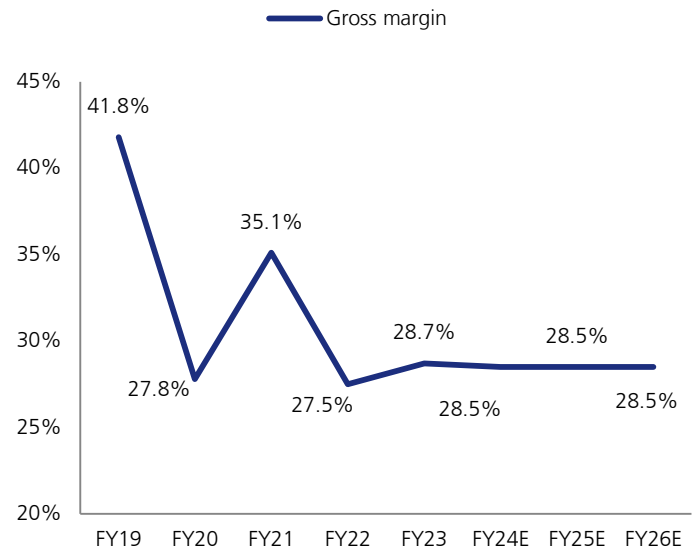
- Kaynes intends to focus on this segment by creating additional teams in product realisation, leveraging existing relationships with customers, and acquiring larger businesses in the hospital-equipment sub-segment.
- Kaynes is associated with a number of healthcare start-ups.
- In this segment, the biggest challenge is taking an idea from the concept stage to the complete-product-realisation stage.
- We expect revenue CAGR of 20% over FY23-26 from this segment with revenue at INR 0.81bn/0.97bn/1.2bn in FY24/25/26 and order book of INR 2.4bn/3.4bn/3.2bn.

Exhibit 34. Healthcare revenue CAGR of c. 20% over next 3 years



Source: Company, JM Financial

Exhibit 1.Gross margin profile for medical segment

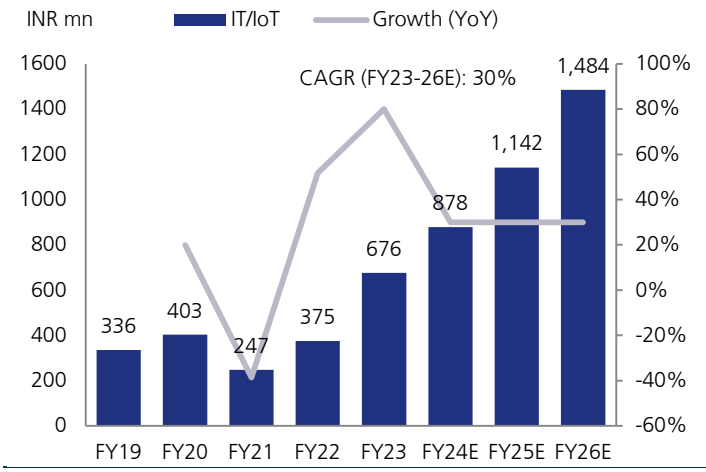


Source: Company, JM Financial

Internet of Things and Information Technology, 6% of revenue

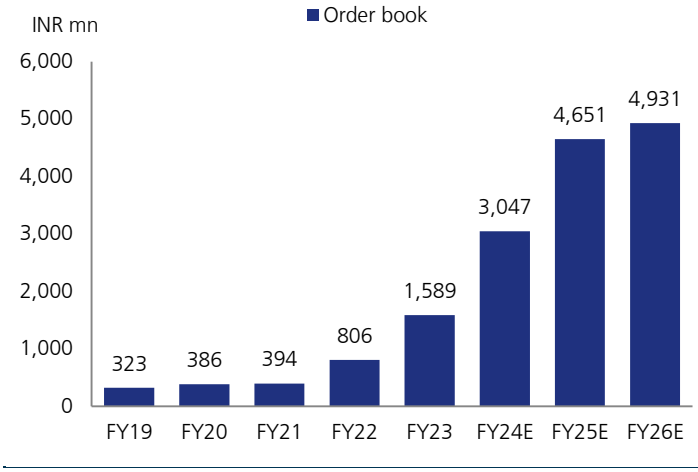
- The IoT market in India will see a CAGR of 16% over 2021-26, touching a size of INR 135bn in 2026. This will be backed by strong connectivity and coverage, rising internet penetration, surge in smart applications adoption, new business models, and government initiatives. We expect c.30% revenue CAGR for Kaynes from this segment over the next 3 years.

Exhibit 35. We expect revenue of INR 0.88bn/1.1bn/1.5bn in FY24/25/26



Source: Company, JM Financial

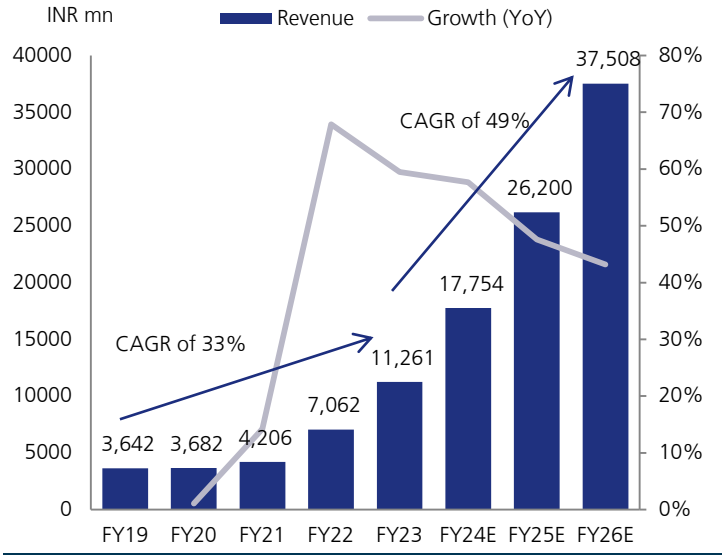
Exhibit 36. Strong order booking will continue in IT/IoT with CAGR of 46% over FY23-26



Source: Company, JM Financial

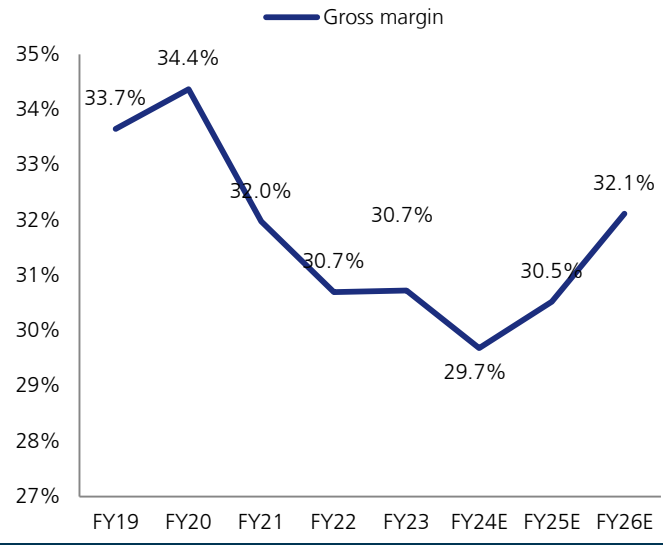
Financial story in charts

Exhibit 37. Kaynes will see a revenue CAGR of c.49% over FY23-26 backed by strong growth in automotive, industrial and railways segments



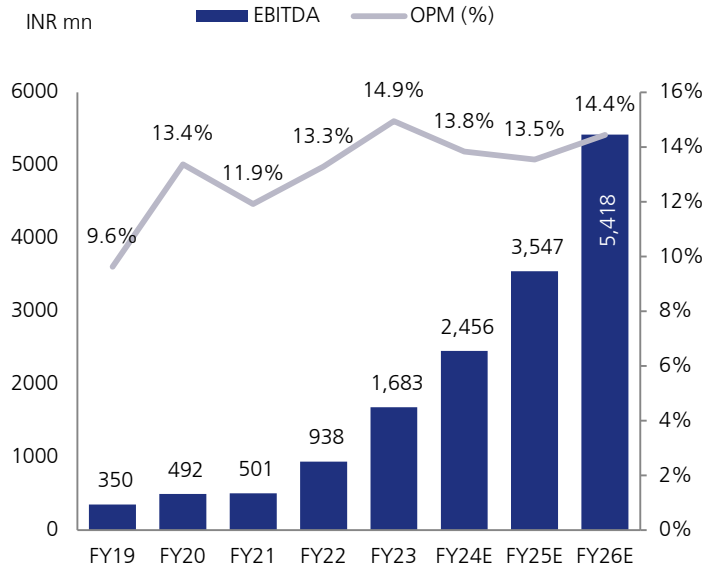
Source: Company, JM Financial

Exhibit 38. Gross margin to increase from FY24 on account of backward integration



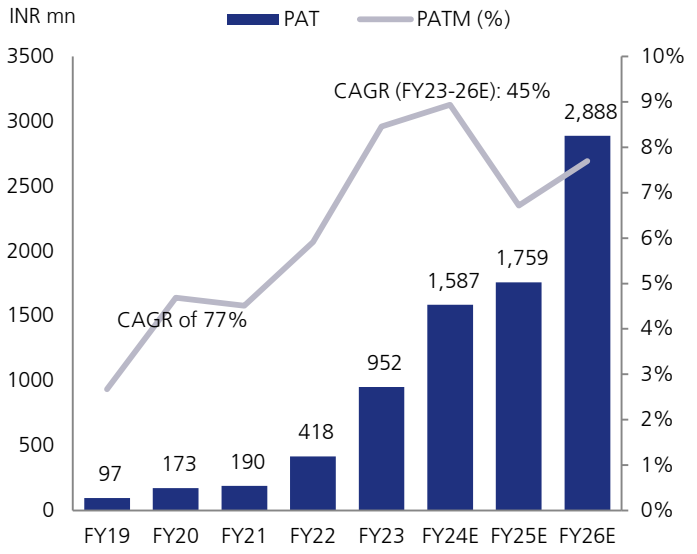
Source: Company, JM Financial

Exhibit 39. OPM to expand with economies of scale



Source: Company, JM Financial

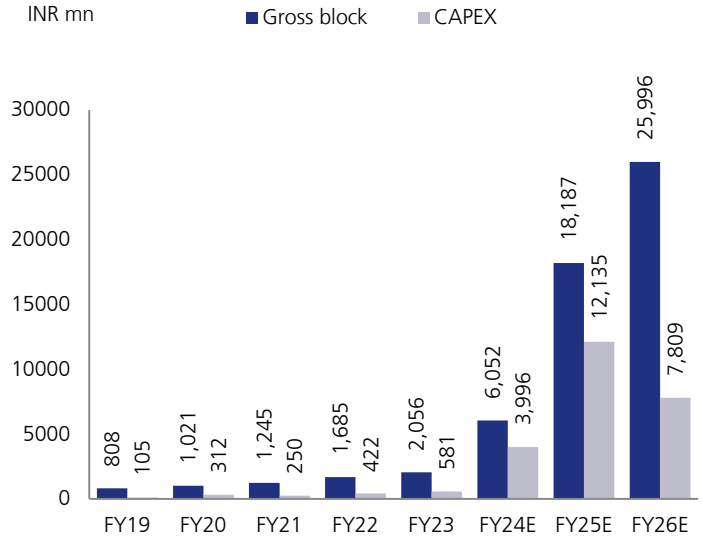
Exhibit 40. Earnings growth to be fluctuating due to regular flow of government incentives



Source: Company, JM Financial

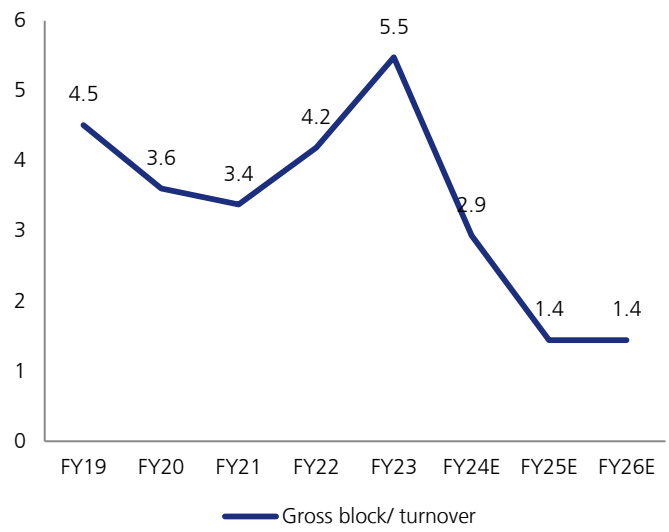
Kaynes will continue to take in orders where it provides high value-add services, which will help in increasing the average order value and lead to margin expansion

Exhibit 41. Capex for EMS capacity expansion, OSAT and PCB will improve gross block



Source: Company, JM Financial

Exhibit 42. New capex will decrease asset turns as OSAT and PCB has asset turns of c.1x



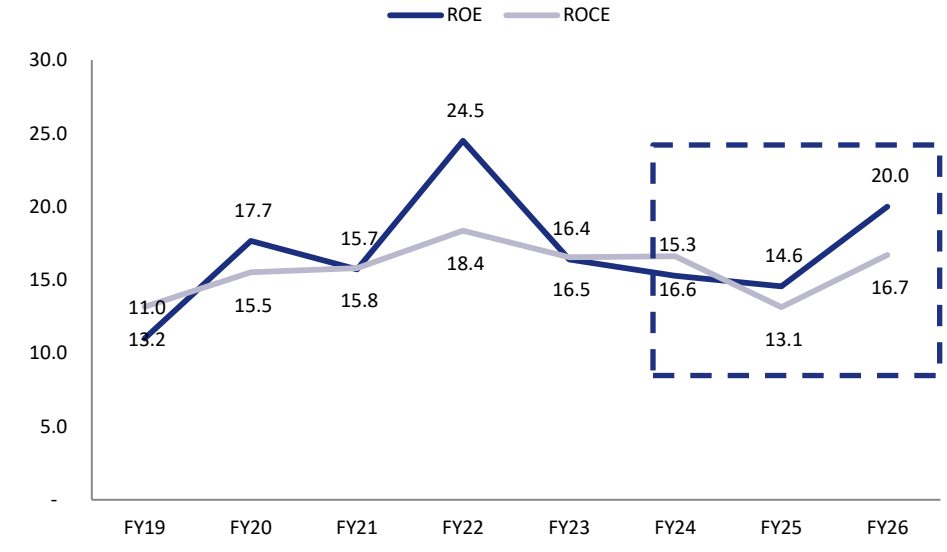
Source: Company, JM Financial

Exhibit 43. Du Pont analysis of Kaynes for FY20-25

Du Pont Analysis	Mar-20	Mar-21	Mar-22	Mar-23	Mar-24	Mar-25	Mar-26
Net profit margin (%)	4.68	4.51	5.92	8.45	8.94	6.71	7.70
Asset turnover (x)	1.44	1.48	1.86	1.02	0.67	0.80	1.03
Leverage multiplier (x)	2.35	1.95	1.82	1.12	1.05	1.20	1.22
RoE (%)	**15.9**	**13.0**	**20.1**	**9.6**	**6.2**	**6.5**	**9.6**

Source: Company, JM Financial

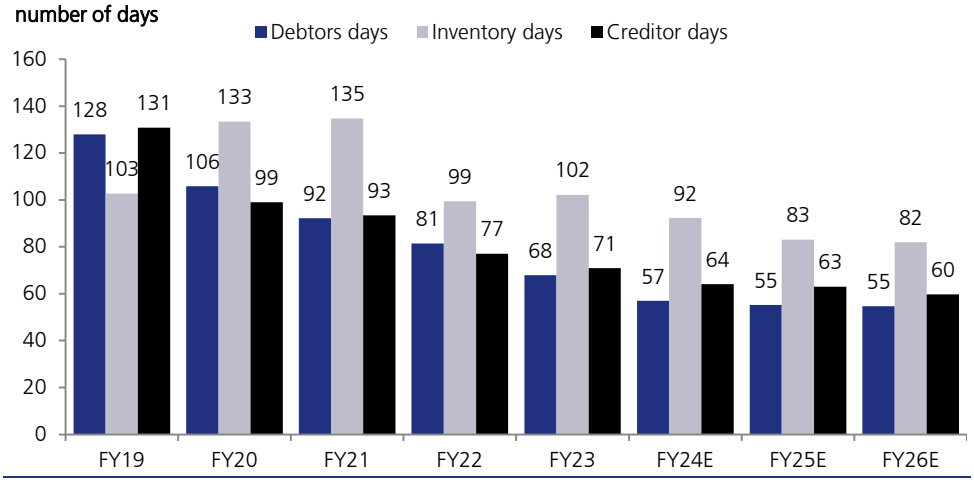
Exhibit 44. Strong growth, margin improvement and government incentive will drive RoE/RoCE growth ahead



Source: Company, JM Financial

Heavy capex in OSAT and PCB dragging the return ration, we expect benefit to reflect from FY27

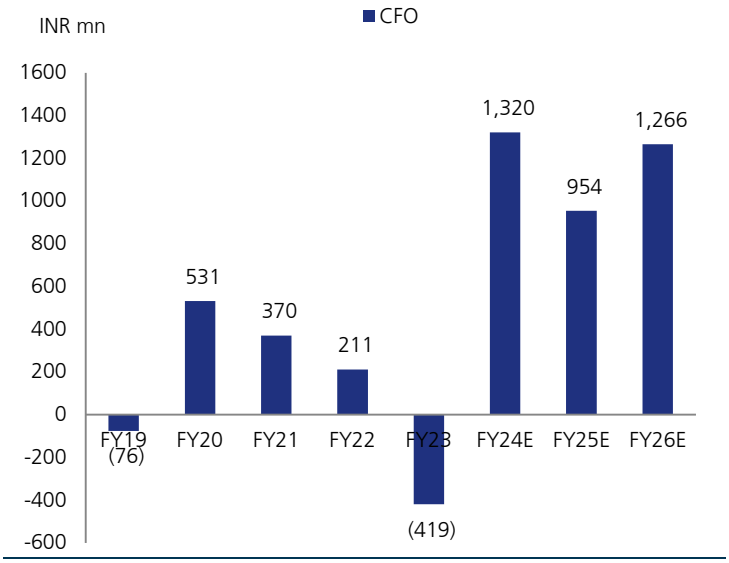
Exhibit 45. Working capital break-up; Short term RM shortage may impact inventory levels, but in long term this will improve dramatically due to development of component ecosystem in India



Source: Company, JM Financial

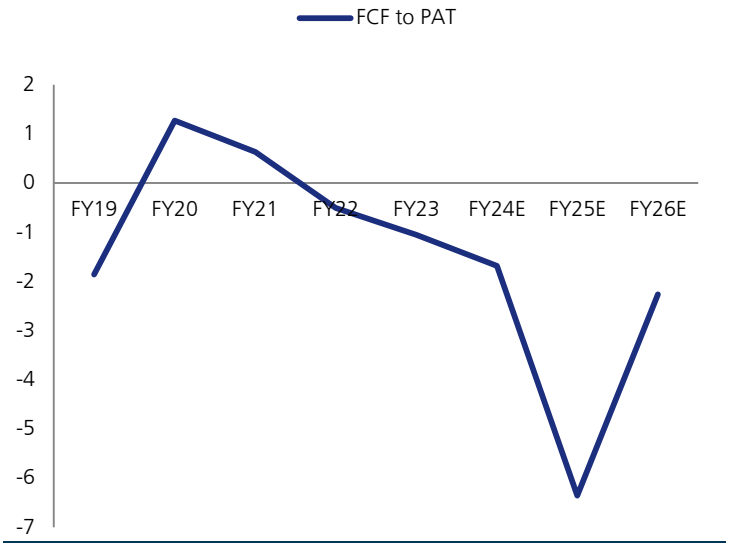
With the development of the component ecosystem in India and semiconductor manufacturing coming to India, we expect improvement in working capital cycle for the domestic players. Additionally, with backward integration plus economy of scale will help in Kaynes in improvement in WC improvement and margins

Exhibit 46. Cash flow will improve going ahead, but since Kaynes is in expansion mode a lot of the cash flow will fund only working capital requirement



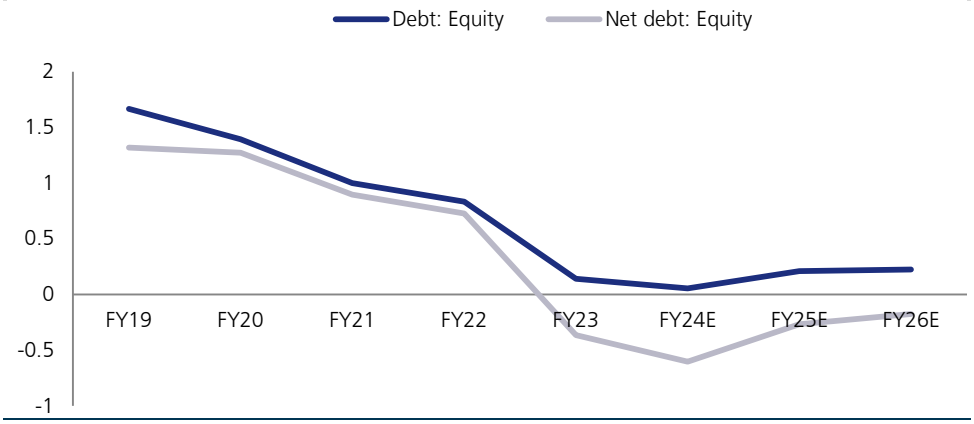
Source: Company, JM Financial

Exhibit 47. FCF to PAT; industry in which Kaynes operates generally requires higher capex to gain competitive intensity, hence free cash flow generation takes time



Source: Company, JM Financial

Exhibit 48. Kaynes will significantly reduce its debt to improve return ratios and net debt levels



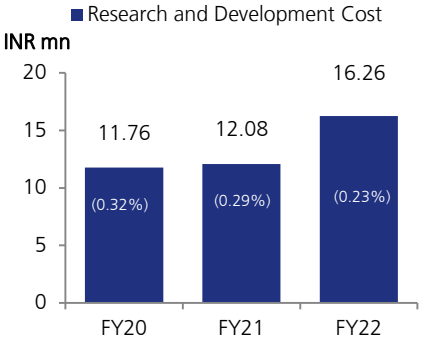
Source: Company, JM Financial

Why do we prefer Kaynes over other players?

- Kaynes will continue to focus on a customised mix of products that give it high margins (high-mix), high-technology, flexible volume production. It will provide value-add services to customers across aerospace, defence and outer-space, railways, medical, IT, industrial and automotive electronics verticals.
- It has proven competencies in prototyping and sourcing, including supplier development for bare PCBs (Printed Circuit Boards), building test jigs, and designing processes for PCBAs (PCB assemblies).
- Given the complex nature of its offerings and the high technology involved, Kaynes has spent a lot of time developing the prototypes and getting approvals for such complex sub-assemblies with its customers. PCBAs constitute just 10-20% of the BoM across industry verticals on average, so they are usually outsourced. And since the time spent by customers in helping Kaynes develop an expertise in these assemblies and solutions is long, customer stickiness is likely to be very high.
- Kaynes will continue to invest in widening its product basket across product segments and will focus on backward integration – PCB and OSAT.
- All of this will help in scaling up the business with existing clients as well as venturing into high-margin and more complex new products within industries, which will aid margin expansion. Kaynes has a dedicated R&D facility at its Mysuru unit with a sharp focus on product development.

Kaynes has gained expertise in complex sub-assemblies, which has resulted in strong customer relationships and a competitive edge

Kaynes has the second-best R&D spend amongst its peers



() - represents % of revenue

Outlook and Valuation

We expect Kaynes to see a strong growth mainly due to:

Favourable industry tailwinds

Development of component/chips ecosystem in India leading to improving supply chains, in turn benefiting Indian EMS companies in terms of margins and working capital improvement,

Strong product mix and focus on adding high-margin segment, on-boarding new value-added customers

Capacity expansion on strong order book visibility, backward integration (bare PCB and OSAT)

Increasing its presence in the domestic market and looking for export opportunities.

With all these positives, We expect the company's revenue/EBITDA/PAT CAGR of c.49%/48%/45% over FY23-26 with OPM of 13.5%/14.4% in FY25/FY26 and earnings growth of c.11%/64% in FY25/26. Based on strong financials, improved RoCE/RoE of c.12.4%/9.7% in FY26, and better working capital visibility, we initiate coverage with a BUY rating and a target price of INR 3,410 - upside 20% from CMP (EMS: 2,269, P/E 45x + PCB: 277, P/E 30x + OSAT: 865, P/E 35x).

Company overview

The business is classified based on the stage of services that it provides to its customers.

- **OEM – turnkey solutions – Box build**: This segment involves complex Box builds, sub-systems and products across industry verticals.
- **OEM – turnkey solutions – PCBA**: It undertakes turnkey EMS of PCBAs, cable harness, magnetics and plastics – ranging from prototyping to product realisation including mass manufacturing.
- **ODM solutions**: It offers ODM services in smart metering, smart street lighting, brush-less DC technology, gallium nitride-based charging technology and provides IoT solutions for making smart consumer appliances or devices IoT connected.
- **Product engineering and IoT solutions**: It offers conceptual design and product engineering in industrial and consumer segments. Services include PCB cladding to embedded design and submitting proof of concept to prototyping.

Exhibit 49. Revenue break-up for the services offered by Kaynes

Segmental revenues (INR mn)	FY20	FY21	FY22	FY23
OEM – Turnkey solutions – Box Build	942	1276	1988	3378
as a % of overall revenues	26%	30%	28%	30%
OEM – Turnkey solutions – PCBA	2290	2509	4436	6982
as a % of overall revenues	62%	60%	63%	62%
ODM solutions	76	184	278	338
as a % of overall revenues	2%	4%	4%	3%
Product engineering and IoT solutions	374	237	360	563
as a % of overall revenues	10%	6%	5%	5%
Total	**3682**	**4206**	**7063**	**11261**

Source: Company, JM Financial

Higher Box-builds revenue will lead to better margins

Kaynes' share of revenue from Box builds increased marginally to 30% in FY23 from 26% in FY20. As it develops competencies across its services towards more complex assemblies, its customers will become more comfortable with its Box-build capabilities. A higher share of Box builds will result in higher margins while Kaynes already earns industry-leading margins.

Manufacturing

- Kaynes operates eight strategically located manufacturing facilities in the states of Karnataka, Haryana, Himachal Pradesh, Tamil Nadu, and Uttarakhand.
- Some of the manufacturing facilities are approved under the Electronics Hardware Technology Park Scheme of Software Technology Park in India.
- Facilities in Manesar (Haryana), Chennai (Tamil Nadu), and Parwanoo (Himachal Pradesh) are close to customers – which helps it to reduce its logistics cost, increase efficiency, and ensures that capex stays minimal.

Exhibit 50. Plant Location

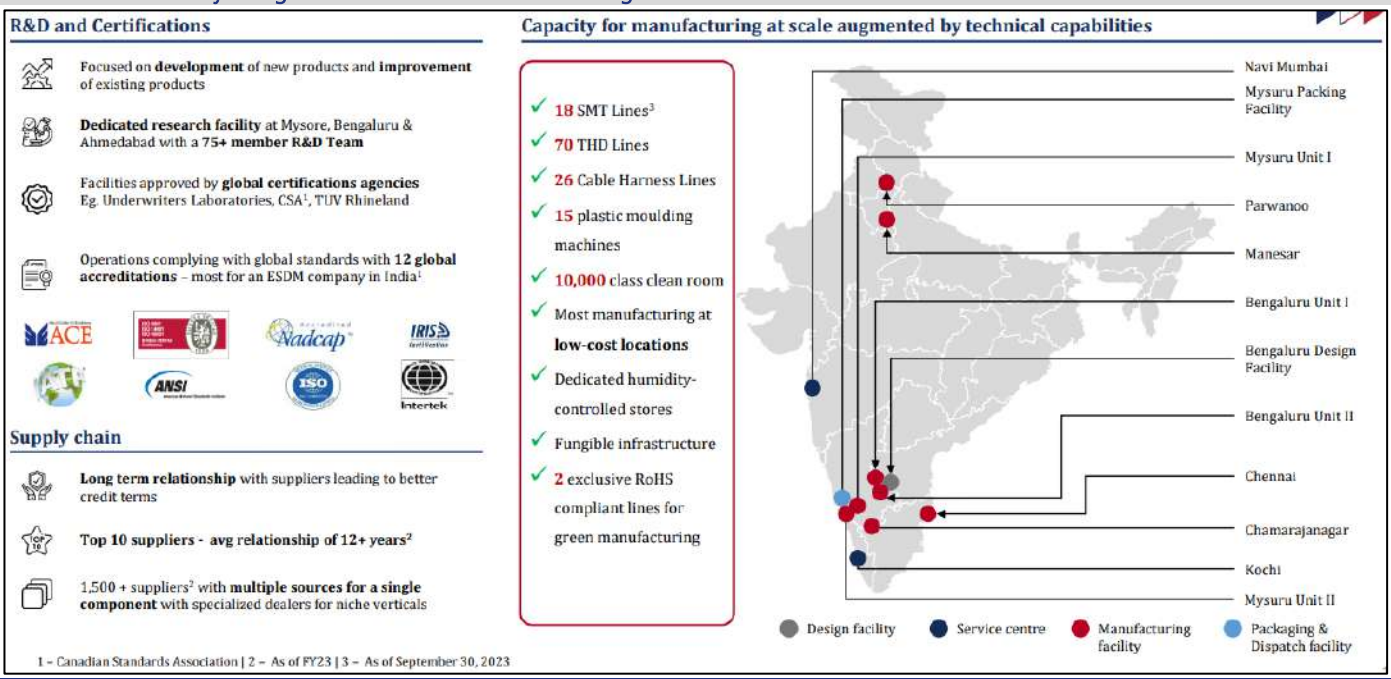
Location	Industries	Area (Sq.ft)	Owned/ Leased
Mysore, Karnataka (Unit 1)	Railways, Defence and Aerospace, Medical and Industrials	126,085	Owned
Mysore, Karnataka (Unit 2)			Leased
Parwanoo, Himachal Pradesh	IT, Telecom, Industrial, Medical and Automotive	5,253	Owned
Selaqui, Uttarakhand	IT and Industrial	5,500	Leased
Bengaluru, Karnataka (Unit 1)	Automotive, Medical, IoT, IT and Industrial	12,425	Leased
Bengaluru, Karnataka (Unit 2)	Automotive and Industrial	13,447	Leased
Chennai, Tamil Nadu	Automotive, Medical and Industrial	10,125	Leased
Manesar, Haryana	Automotive, Medical and Industrial	88,000	Leased
Chamarajanagar, Karnataka	Electronic assemblies, box-build, cable harness, electro mechanical assemblies	871,200	Owned
Kongara Kalan, Telangana	OSAT Facility	2,003,760	Owned

Source: Company, JM Financial

Product lifecycle support, comprehensive manufacturing capabilities

Kaynes collaborates with its customers through the entire product life-cycle and after-sales and end-of-life services including assisting with concept creation, product development, prototyping, testing and mass manufacturing. It has customised lines for box building, integration and testing, manufacturing facilities for cable forms and harnesses, plastic moulding, fabrication facilities as well as burn-in/soak-test facility.

Exhibit 51. Internationally recognised and certified manufacturing facilities



Source: Company, JM Financial

Diversified product portfolio

Exhibit 52. Diversified product portfolio across key industry verticals

Source: Company, JM Financial

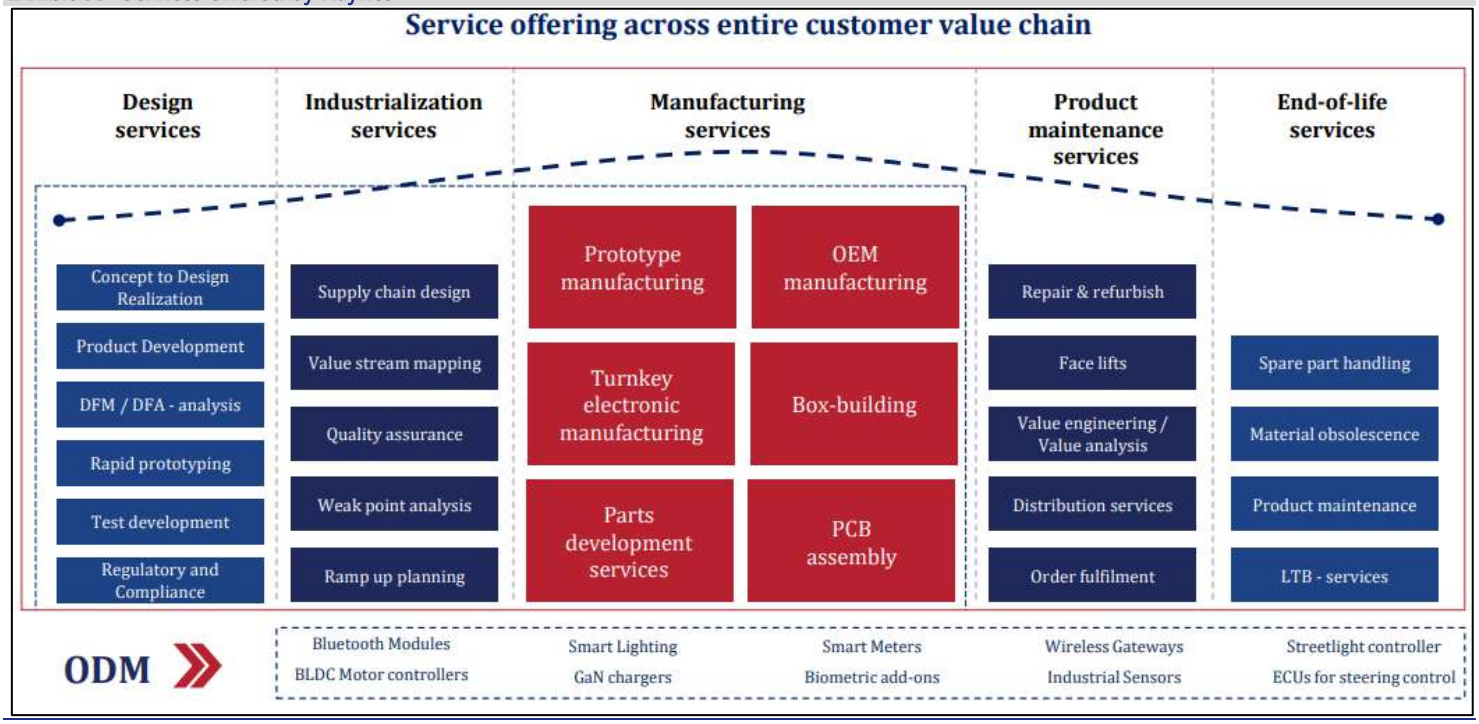
R&D set-up: 24 employees, facility in Mysuru

- As of 31st Mar'23, the research and development team comprised 75 employees, including engineers, designers and other workers.
- Kaynes has a dedicated research and development facility in its Mysuru (Karnataka) facility.
- It is investing on better equipment and technologies, which will increase operational efficiencies and better the rate of output per hour. This kind of vertical integration will lead to a reduction in time to market, and will solidify Kaynes' position in the EMS space in India.

Focus on ODM services because of higher margins

- Kaynes takes care of everything for its customers, right from designing to product assembly and further after-sale services. It is at a nascent stage, and with more economies of scale and ramp up in business operations, it will be investing more in providing ODM services to its customers. With scale, its customers' trust in the company will increase, crucially in terms of designing, which will increase the share of its ODM (higher-margin business).

Exhibit 53. Services offered by Kaynes



Source: Company, JM Financial

Experienced board to drive the next leg of growth

Exhibit 54. Key managerial persons will help the company achieve its goals faster

Person	Designation	Description
Ramesh Kunhikannan	MD & Promoter	• 33+ years of experience in EMS. • Associated with the company since inception. • Bachelor of Electrical Engineering from NIE, Mysore.
Savitha Ramesh	Chairperson	• 25+ years of experience in EMS. • Associated with the company since inception. • B. Com from University of Madras.
Jairam Paravastu Sampath	CFO	• 30+ years of experience in EMS. • Associated with the company since 2011. • B. Tech from IIT Madras and PGDM from IIM Ahmedabad.
Rajesh Sharma	CEO	• 15+ years of experience in accounting and finance. • Bachelor's degree from the University of Bangalore and an associate member of the ICAI of India.
Sajan Anandaraman	Head of commercial and corporate affairs	• 20+ years of experience across multiple verticals in Kaynes. • Bachelor's degree in electronical and electronics engineering from University of Calicut.

Source: Company, JM Financial

Financial Tables (Consolidated)

Income Statement (INR mn)

Y/E March	FY22A	FY23A	FY24E	FY25E	FY26E
Net Sales	7,062	11,261	17,754	26,200	37,508
Sales Growth	67.9%	59.4%	57.7%	47.6%	43.2%
Other Operating Income	0	0	0	0	0
Total Revenue	**7,062**	**11,261**	**17,754**	**26,200**	**37,508**
Cost of Goods Sold/Op. Exp	4,894	7,801	12,484	18,203	25,462
Personnel Cost	0	0	0	0	0
Other Expenses	1,230	1,777	2,814	4,450	6,627
EBITDA	**938**	**1,683**	**2,456**	**3,547**	**5,418**
EBITDA Margin	13.3%	14.9%	13.8%	13.5%	14.4%
EBITDA Growth	87.0%	79.5%	45.9%	44.4%	52.8%
Depn. & Amort.	132	187	267	1,328	2,093
EBIT	806	1,496	2,189	2,219	3,326
Other Income	41	114	355	674	1,220
Finance Cost	256	349	476	408	728
PBT before Excep. & Forex	591	1,260	2,068	2,485	3,817
Excep. & Forex Inc./Loss(-)	0	0	0	0	0
PBT	591	1,260	2,068	2,485	3,817
Taxes	174	308	481	726	930
Extraordinary Inc./Loss(-)	0	0	0	0	0
Assoc. Profit/Min. Int.(-)	0	0	0	0	0
Reported Net Profit	418	952	1,587	1,759	2,888
Adjusted Net Profit	**418**	**952**	**1,587**	**1,759**	**2,888**
Net Margin	5.9%	8.5%	8.9%	6.7%	7.7%
Diluted Share Cap. (mn)	46.2	58.1	58.1	63.9	63.9
Diluted EPS (INR)	**9.0**	**16.4**	**24.8**	**27.5**	**45.2**
Diluted EPS Growth	98.2%	81.1%	51.7%	0.9%	64.1%
Total Dividend + Tax	0	0	0	0	0
Dividend Per Share (INR)	0.0	0.0	0.0	0.0	0.0

Source: Company, JM Financial

Balance Sheet (INR mn)

Y/E March	FY22A	FY23A	FY24E	FY25E	FY26E
Shareholders' Fund	2,026	9,590	11,177	12,994	15,882
Share Capital	462	581	581	639	639
Reserves & Surplus	1,564	9,009	10,596	12,355	15,243
Preference Share Capital	0	0	0	0	0
Minority Interest	11	13	13	13	13
Total Loans	1,695	1,359	1,359	5,622	6,657
Def. Tax Liab. / Assets (-)	68	77	77	77	77
Total - Equity & Liab.	**3,800**	**11,039**	**12,626**	**18,706**	**22,629**
Net Fixed Assets	1,217	1,610	5,339	16,031	21,747
Gross Fixed Assets	1,685	2,056	6,052	18,187	25,996
Intangible Assets	23	23	23	23	23
Less: Depn. & Amort.	575	763	1,030	2,473	4,566
Capital WIP	83	293	293	293	293
Investments	15	33	33	33	33
Current Assets	4,992	12,544	26,172	25,904	29,865
Inventories	2,264	4,132	4,981	7,103	9,972
Sundry Debtors	1,977	2,271	3,349	4,682	6,700
Cash & Bank Balances	216	4,860	16,560	12,838	11,911
Loans & Advances	0	0	0	0	0
Other Current Assets	535	1,282	1,282	1,282	1,282
Current Liab. & Prov.	2,424	3,148	4,421	6,009	7,673
Current Liabilities	1,641	2,229	3,501	5,089	6,754
Provisions & Others	783	919	919	920	920
Net Current Assets	2,569	9,396	21,751	19,895	22,192
Total – Assets	**3,800**	**11,039**	**27,122**	**35,959**	**43,971**

Source: Company, JM Financial

Cash Flow Statement (INR mn)

Y/E March	FY22A	FY23A	FY24E	FY25E	FY26E
Profit before Tax	591	1,260	2,068	2,485	3,817
Depn. & Amort.	132	187	267	1,328	2,093
Net Interest Exp. / Inc. (-)	254	265	121	-266	-492
Inc (-) / Dec in WCap.	-742	-1,629	-655	-1,867	-3,223
Others	-2	0	0	0	0
Taxes Paid	-22	-503	-481	-726	-930
Operating Cash Flow	**211**	**-419**	**1,320**	**954**	**1,266**
Capex	-422	-581	-3,996	-12,135	-7,809
Free Cash Flow	-212	-1,001	-2,675	-11,181	-6,543
Inc (-) / Dec in Investments	0	0	0	0	0
Others	-23	-4,352	852	3,603	5,310
Investing Cash Flow	**-445**	**-4,933**	**-3,144**	**-8,532**	**-2,498**
Inc / Dec (-) in Capital	228	6,600	14,000	0	0
Dividend + Tax thereon	0	0	0	0	0
Inc / Dec (-) in Loans	301	-336	0	4,263	1,035
Others	-256	-720	-476	-408	-728
Financing Cash Flow	**272**	**5,543**	**13,524**	**3,856**	**306**
Inc / Dec (-) in Cash	**38**	**191**	**11,700**	**-3,723**	**-926**
Opening Cash Balance	178	2,215	4,860	16,560	12,837
Closing Cash Balance	216	4,860	16,560	12,837	11,911

Source: Company, JM Financial

Dupont Analysis

Y/E March	FY22A	FY23A	FY24E	FY25E	FY26E
Net Margin	5.9%	8.5%	8.9%	6.7%	7.7%
Asset Turnover (x)	2.1	1.5	0.9	0.8	0.9
Leverage Factor (x)	1.9	1.3	1.8	2.6	2.8
RoE	24.5%	16.4%	15.3%	14.6%	20.0%

Key Ratios

Y/E March	FY22A	FY23A	FY24E	FY25E	FY26E
BV/Share (INR)	43.8	164.9	192.2	203.4	248.6
ROIC	18.6%	23.6%	165.8%	183.1%	30.7%
ROE	24.5%	16.4%	15.3%	14.6%	20.0%
Net Debt/Equity (x)	0.7	-0.4	-1.4	-0.6	-0.3
P/E (x)	315.6	174.3	104.6	103.7	63.2
P/B (x)	65.1	17.3	14.8	14.0	11.5
EV/EBITDA (x)	196.4	106.4	68.2	49.5	32.7
EV/Sales (x)	26.1	15.9	9.4	6.7	4.7
Debtor days	102	74	69	65	65
Inventory days	117	134	102	99	97
Creditor days	98	85	84	82	77

Source: Company, JM Financial

Syrma SGS Technology | BUY

Strong growth in core; diversifying into high margin segme

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Syrma is a largest listed EMS player in India in terms of revenue and scale, operating through 12 manufacturing facilities across India. Its end-user industries are diverse along with strong product portfolios like PCBAs, RFID tags, and electromagnetic and electromechanical parts. Its expanding focus on healthcare and railway segment + exploring new segments like aerospace and defence will be margin accretive. We expect Syrma to explore the low hanging OSAT opportunity in the semiconductor value chain in the next 1-2 years. As of 9MFY24, Syrma has an order book of INR 45bn (INR 31bn in FY23), which is almost 1.5x of FY24E revenue, executable over the next 12-15 months.

- **Strong manufacturing base with diversified supplier network:** Syrma has significantly increased its SMT lines to 26 in FY24 from 15 in FY20 (likely to add further 4 lines to reach 30) and will be highest amongst its peers. Syrma is not reliant on any one vendor for a majority of its components and has diversified its supplier base resulting in easy availability of raw materials, better negotiation of rates and with good credit terms. Syrma's payables days are c.95 days as of FY24, much higher than the peers due to its higher supplier base.
- **Diversified client base provides a natural hedge:** Syrma added c.200 customers over FY20-23, taking the total number to 250, of which c.15-18 customers have been associated with the company for 10+ years. Also, its Top -5 customer concentration has reduced to 25% in FY24 from 35% in FY23, which creates a shield for the business from any unforeseen disruption. We expect it to add new customers across industries like industrials, consumer,automobile (largely EVs) and railways over the next 2-3 years (high margin segment).
- **A strong product portfolio with focus on increasing the value-added category**: Syrma is now increasing its focus to improve the share of value-added category, which will support margins in the long term. Its Box Build share has gone up from 18% in FY23 to 25% in FY24. Also, it is the first in India to start manufacturing of RFID, which generally has margins 250-300bps higher than that of PCBA.
- **Syrma will see strong growth across the industry verticals:** (1) Automotive to ride on EV story at a CAGR of c.56% over FY23-26, (2) Consumer to see CAGR of c.41% with focus on low penetrated segments, (3) Industrial to CAGR c.31% on the back of increasing infra spends + Make in India theme, (4) Deal with JDHL will boost overall revenue + margins in Healthcare and (5) Railways to grow at CAGR of c.54% on the back of strong tailwinds.
- **We initiate with BUY with TP of INR 675:** Syrma will see FY24/25/26 earnings growth of c.59%/42%; based on strong earning CAGR, improving returns ratios, and improved working capital visibility, we value the company at 35x its FY26 EPS. We initiate coverage with a BUY rating and a target price of INR 675.

Recommendation and Price Target	
Current Reco.	BUY
Previous Reco.	NA
Current Price Target (12M)	675
Upside/(Downside)	28.5%
Previous Price Target	NA
Change	NA

Key Data – SYRMA IN	
Current Market Price	INR525
Market cap (bn)	INR93.3/US$1.1
Free Float	29%
Shares in issue (mn)	176.8
Diluted share (mn)	176.8
3-mon avg daily val (mn)	INR443.4/US$5.3
52-week range	705/251
Sensex/Nifty	73,143/22,213
INR/US$	82.9

Price Performance			
%	1M	6M	12M
Absolute	-12.5	-2.3	89.6
Relative*	-15.5	-13.4	54.1

* To the BSE Sensex

Financial Summary					(INR mn)
Y/E March	FY22A	FY23A	FY24E	FY25E	FY26E
Net Sales	12,666	20,484	29,657	43,131	58,169
Sales Growth (%)	42.7	61.7	44.8	45.4	34.9
EBITDA	1,260	1,878	2,110	3,136	4,889
EBITDA Margin (%)	9.9	9.2	7.1	7.3	8.4
Adjusted Net Profit	764	1,231	1,307	2,080	3,399
Diluted EPS (INR)	4.3	7.0	7.4	11.8	19.2
Diluted EPS Growth (%)	16.5	60.5	6.2	59.1	63.4
ROIC (%)	11.4	8.8	7.0	10.8	15.4
ROE (%)	13.8	11.7	8.1	11.7	16.6
P/E (x)	121.0	75.4	71.0	44.6	27.3
P/B (x)	16.2	6.0	5.6	4.9	4.2
EV/EBITDA (x)	74.8	50.6	44.0	29.9	19.1
Dividend Yield (%)	0.0	0.0	0.0	0.0	0.0

Source: Company data, JM Financial. Note: Valuations as of 23/Feb/2024

JM Financial Research is also available on:
Bloomberg - JMFR <GO>,
Thomson Publisher & Reuters,
S&P Capital IQ, FactSet and Visible Alpha

Please see Appendix I at the end of this report for Important Disclosures and Disclaimers and Research Analyst Certification.

Strong manufacturing base with diversified supplier network

Syrma has the highest line of Surface Mount Technology (SMT) amongst its peers. Also, the company's state-of-the-art R&D and manufacturing facilities is helping it to evolve from being from just a PCBA player to an integrated Electronics System Design and Manufacturing (ESDM) solutions provider. Its manufacturing facilities are strategically located, enabling seamless exports. It is the first company in India to manufacture RFID products. It has invested in a fully automated line of RFID that can produce 1,00,000 lakh tags a day or 2.5mn tags p.m., leading to higher output per hour.

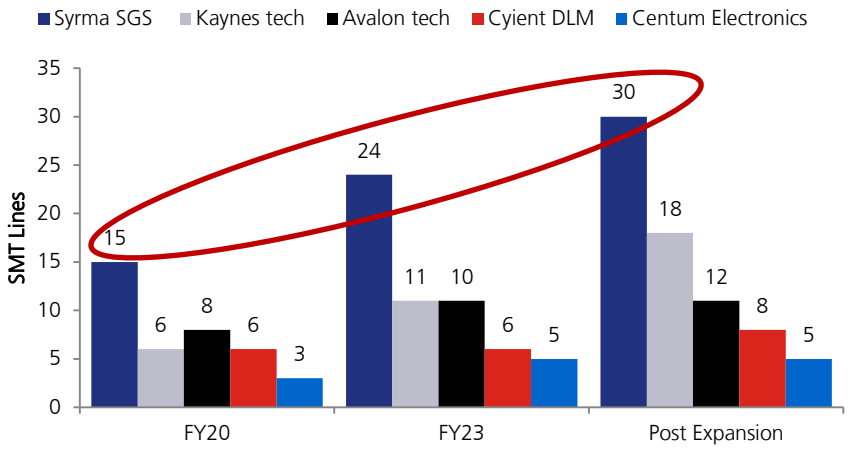
Syrma has a 100+ R&D team with three facilities, including in Germany. By investing in R&D, Syrma aims to widen its product offerings to customers, which will help it to increase its wallet share with them and enable cross-selling opportunities.

It is beneficiary of PLI under IT hardware, White goods, Telecom, etc.

Focus on R&D and latest manufacturing facilities = Own ODM solutions

State-of-the-art manufacturing capabilities and focus on in-house R&D has led Syrma to develop its own ODM solutions for customers. Continued focus on ODM will help the company to gain wallet share with existing customers and garner better operating margins.

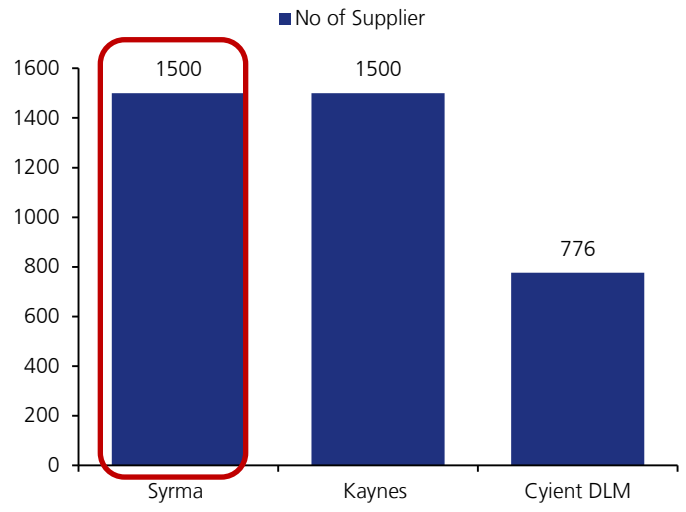
Exhibit 1. Syrma will double its SMT lines post expansion and have highest lines amongst peers, giving it an edge in customers/products addition



Source: Company, JM Financial

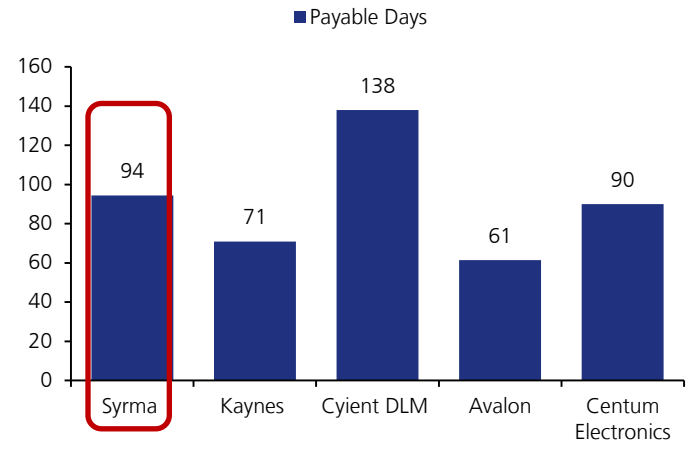
Syrma is not reliant on any one vendor for a majority of its components and has diversified its supplier base, which ensures availability of raw materials and components and allows it to negotiate cost-effective rates with suppliers at good credit terms. Syrma can leverage its global sourcing capabilities to optimise its costs and lower lead time to market. We expect that with supplier diversification, Syrma is moving towards improving its supply chain efficiency

Exhibit 2. Syrma has diversified supplier network of c.1500 as of FY24



Source: Company, JM Financial

Exhibit 3. Syrma gets benefit of supplier diversification in terms of payable days and with economies of scale it will further improve its WC and margins



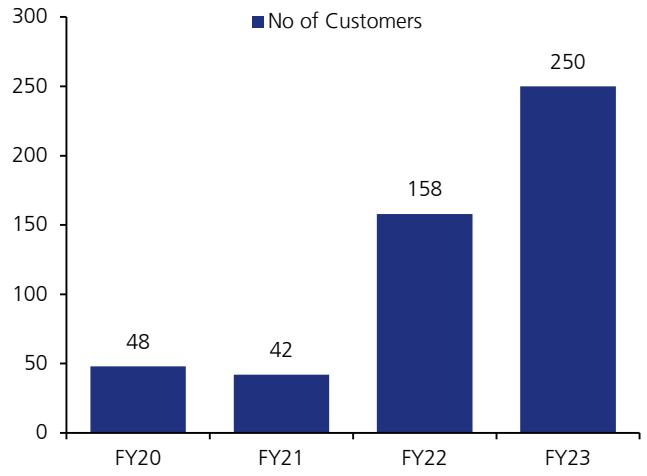
Source: Company, JM Financial

Diversified client base provides a natural hedge

Syrma's product portfolio has enabled it to build a wide customer base across many end-user industries. Its wide customer base and their presence across diversified industries acts as a natural hedge against a downturn in any one industry vertical. It added c.200 customers over FY20-23 taking the total number of customers to 250, of which c.15-18 customers have been associated with the company for 10+ years. Top-5/10/20 customers contributed 35%/51%/67% of revenue in FY23 and no customer accounts for more than 10-12% of overall revenue. Low customer concentration shields the business from any unforeseen disruption.

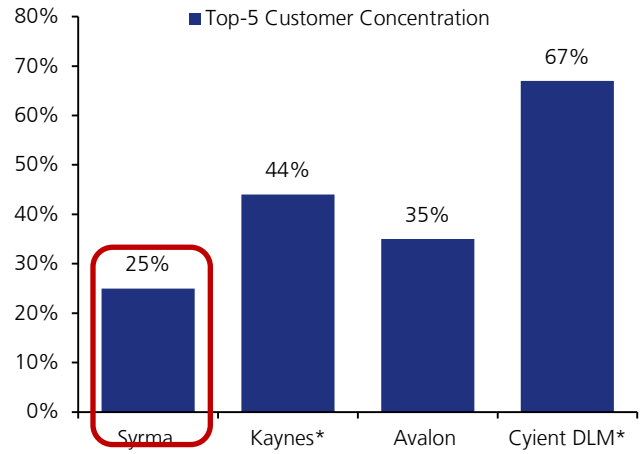
Recently, Syrma has been adding big customers in segments like railways and EVs, which will drive growth for the next 2-3 years

Exhibit 4. Strong customer addition in last 3 years



Source: Company, JM Financial

Exhibit 5. Syrma has low customer concentration and is now focusing on value-added customers

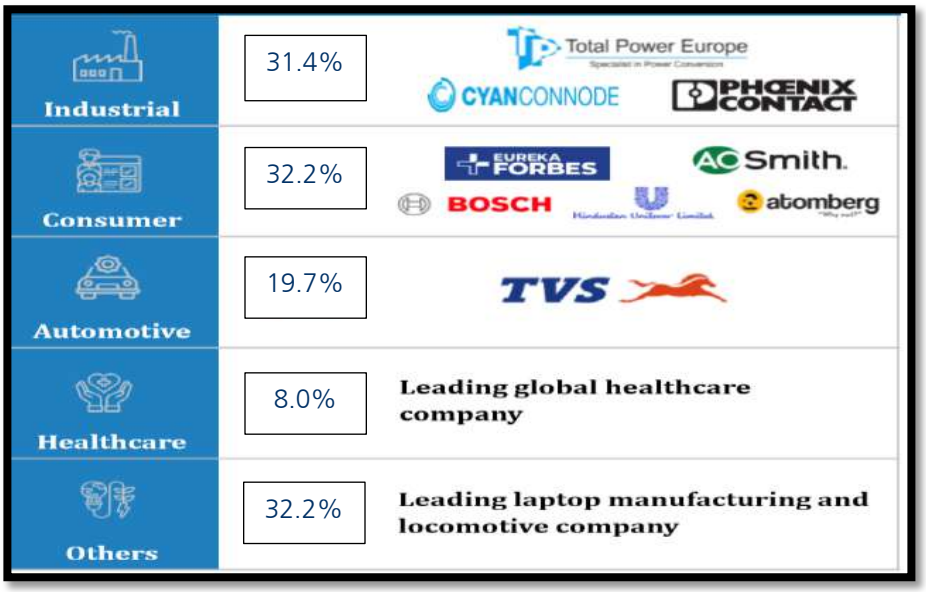


Source: Company, JM Financial

Syrma intends to increase its wallet share with existing customers by working on developing a broader product portfolio for them. The company has built long-standing relationships with some customers, which it hopes to leverage by banking on cross-selling and upselling opportunities that its product portfolio offers

We expect Syrma to increase share from segments such as industrials, consumer, automobile (largely EVs) and railways over the next 2-3 years because of new customer additions and increasing share of export revenue

Exhibit 6. Syrma has Strong customer profile

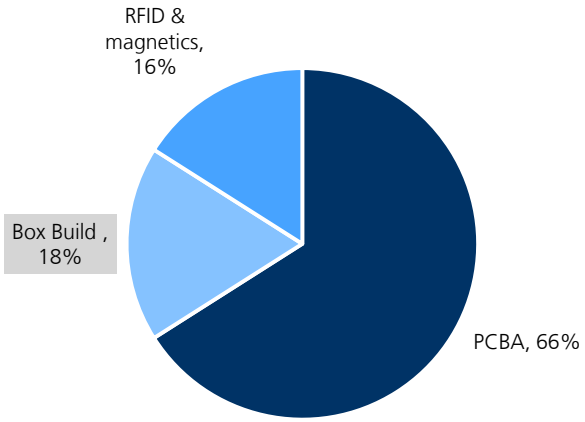


Source: Company, JM Financial * as a % of FY23 revenue.

A strong product portfolio with focus on increasing the value-added category

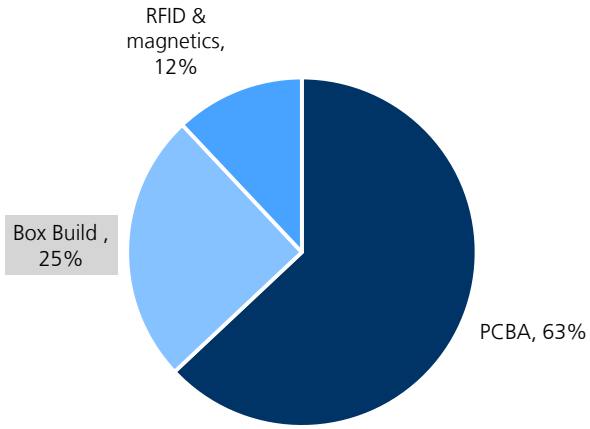
Syrma is one of the only four players in India that is not just into PCBA; its diversified revenue streams provide a higher addressable market. Moreover, it has been focusing on entering into industries that are offering higher margins. Its product range includes PCBA, Box builds and RFID. Syrma acquired Perfect ID in October 2021 for manufacturing of RFID label tags and passive inlay tags, which will help it to expand its market share in the EMS segment in India. Its Box build share has gone up from 18% in FY23 to 25% in FY24, resulting in higher margins visibility, going ahead.

Exhibit 7. Revenue breakup in FY23



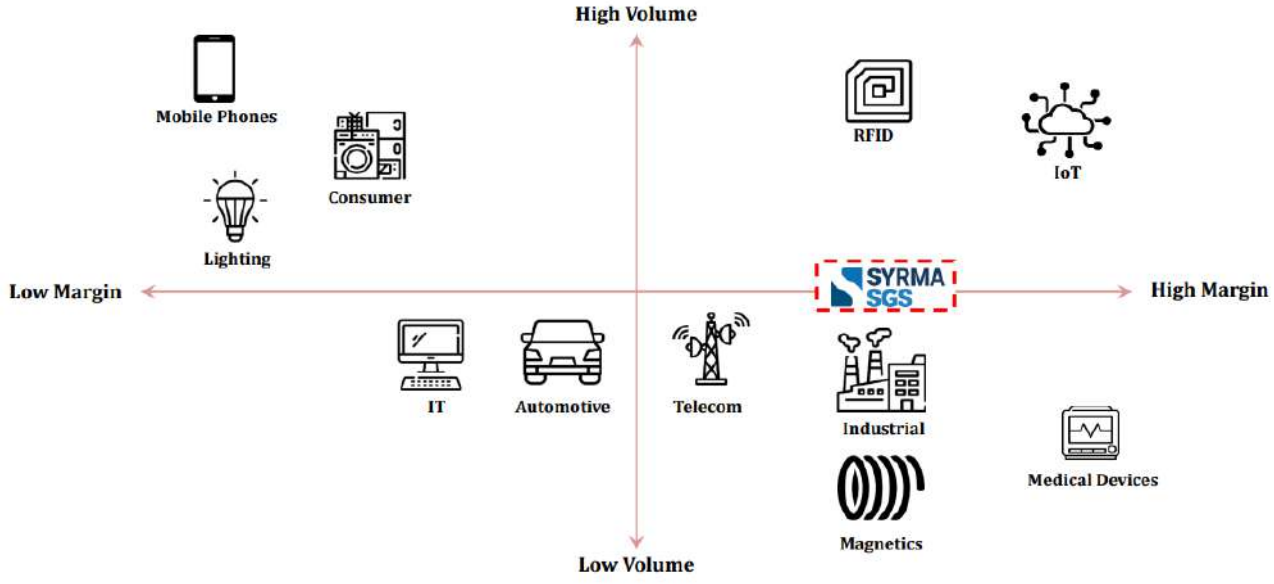
Source: Company, JM Financial

Exhibit 8. Revenue breakup in FY24E, higher focus on Box Build.



Source: Company, JM Financial

Exhibit 9. Its product mix is customised towards higher-margin lower volume products (high mix) – which help the company in de-risking volumes and improving margins

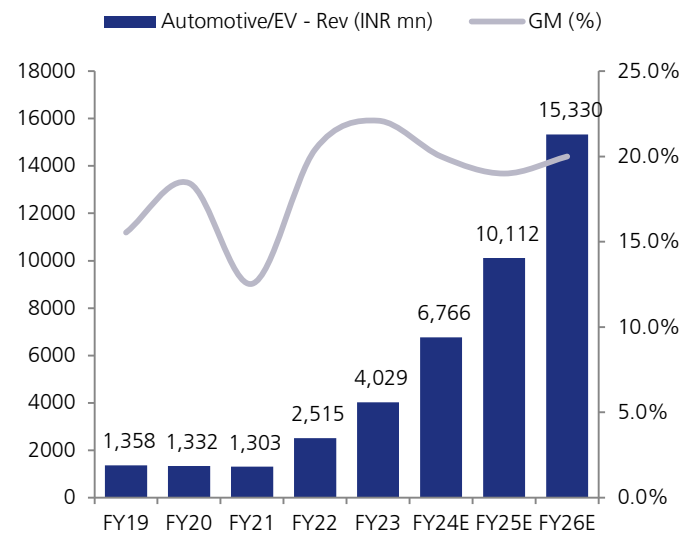


Source: Company, JM Financial

Syrma to see strong growth across key industry verticals

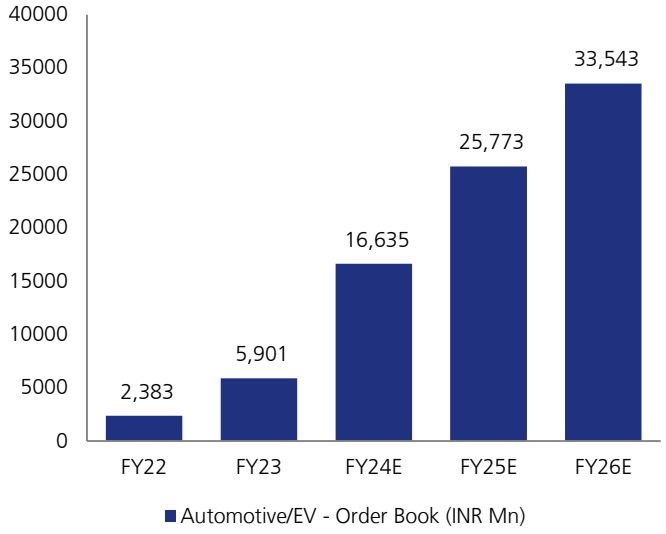
Automotive segment to ride on EV story at a CAGR of c.56% over FY23-26: Automakers are creating separate EV businesses in anticipation of the EV boom in India. The country is expected to aggressively push toward electrification, especially in transportation. OEMs can partner with charging infrastructure operators, aggregators, and manufacturers to set up networks for normal and fast chargers across the country. The electronics content in a combustion two-wheeler is INR 2,000 per vehicle, while this figure would be INR 15,000-20,000 for an EV two-wheeler. The corresponding figures for combustion/EV four-wheelers will be INR 5,000-6,000/INR 60,000-70,000. Automotive segment currently has an order book of c.INR 16.6bn. We expect revenue of INR 6.7bn/10bn/15bn in FY24/25/FY26 largely because of customer addition in two-wheeler EVs and some share from four-wheeler EVs, which will lead to margin expansion (EVs earn better margins).

Exhibit 10. Automotive: revenue CAGR of 56% over the next two years



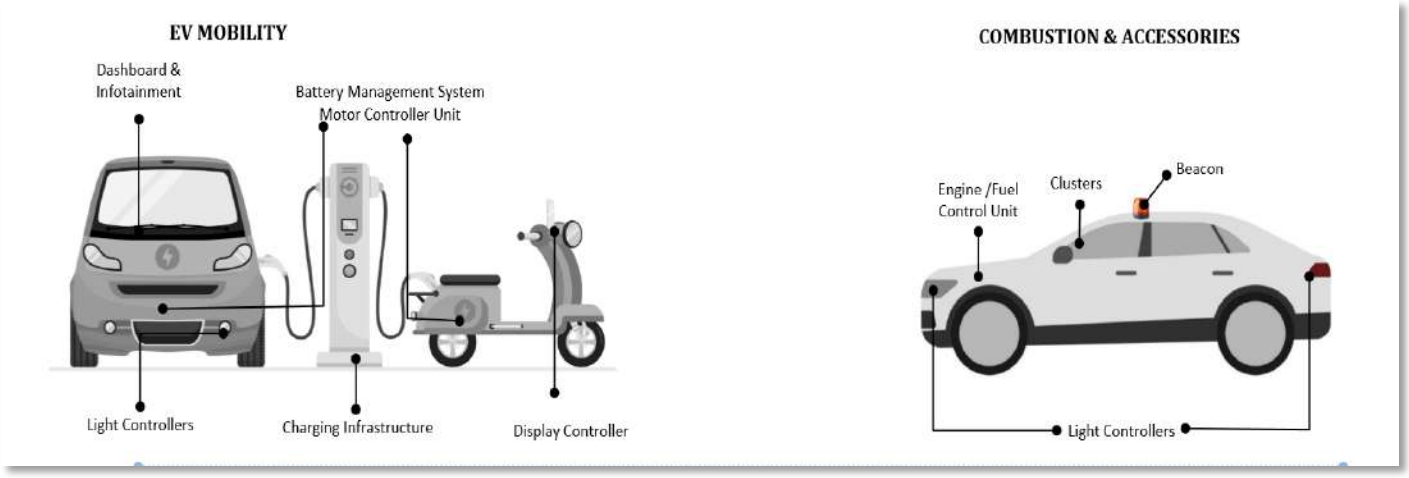
Source: Company, JM Financial

Exhibit 11. Order book continues to provide revenue visibility; we expect order inflow of INR 19.2/23.1bn in FY25/26



Source: Company, JM Financial

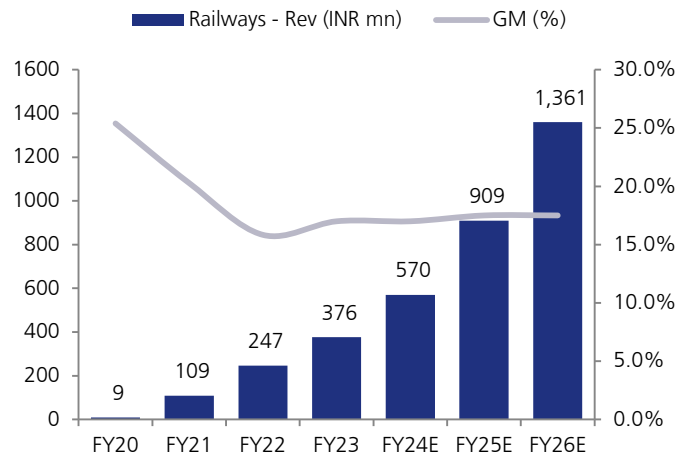
Exhibit 12. Product Offering under the Automotive & EV Segment



Source Company, JM Financial

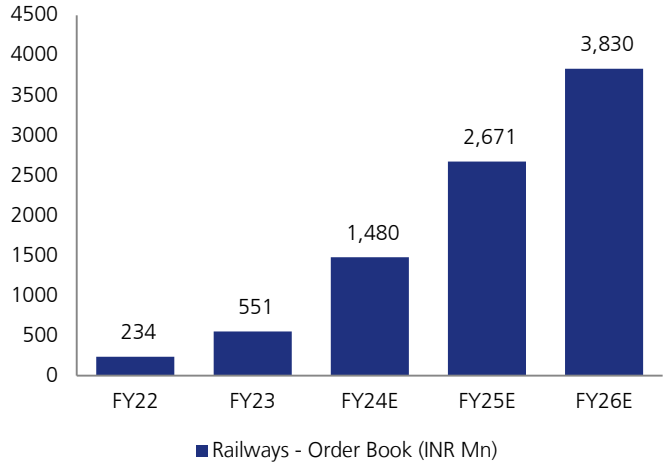
Railways to CAGR of c.54% over FY23-26 on back of strong tailwinds: Syrma has received the Research Designs and Standards Organization (RDSO) approval for its railways segment resulting significant increase in contribution of railways to overall revenues, also increasing use electronics components in railway signalling and increase in export opportunities will further drive the growth. Kyosan is the key client in this segment and now with strong tailwinds we expect more customer addition in this segment.

Exhibit 13. Railways segment will see CAGR of c.54% over FY23-26



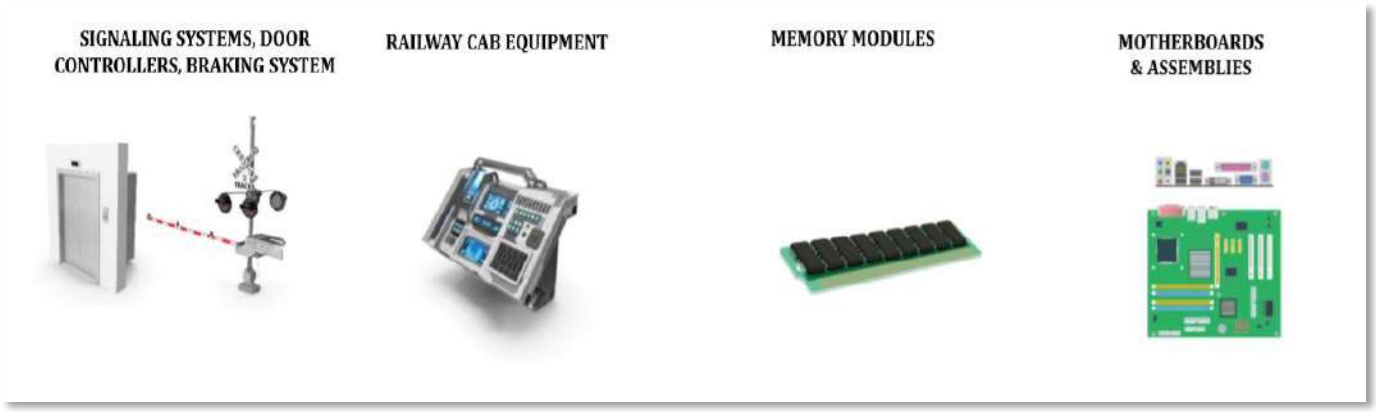
Source: Company, JM Financial

Exhibit 14. Order book will see CAGR of c. 91% over FY23-26



Source: Company, JM Financial

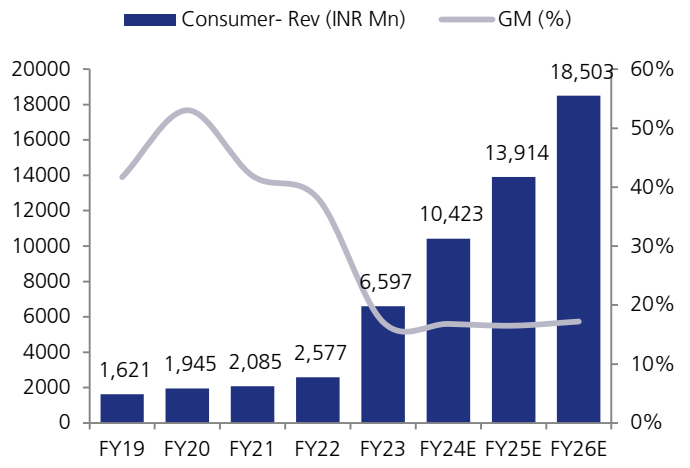
Exhibit 15. Product offerings under IT & Railway. We expect with IT hardware policy and Railway electrification; Syrma to add more products in this segment going ahead.



Source: Company, JM Financial

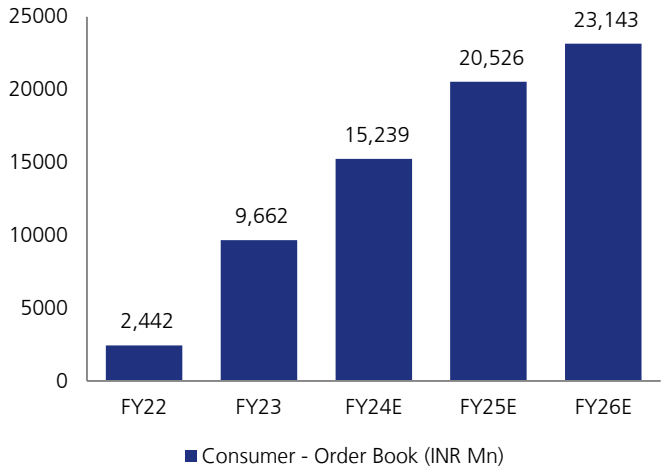
Consumer electronics to CAGR c.41% with focus on low penetrated segments: Low penetration levels of most consumer electronics and appliances categories leaves huge headroom for the industry to grow – more so in large semi-urban and rural markets of India. The advent of IoT and AI opens a wide array of possibilities. RACs, water purifier, etc have very strong growth potential ahead due to low penetration. We expect water purifiers to be a major contributor for this segment over the next 2-3 years along with IT products, controllers, hearables and wearables.

Exhibit 16. We expect revenue CAGR of c. 41% from FY23-26; we are not factoring much benefit of value added



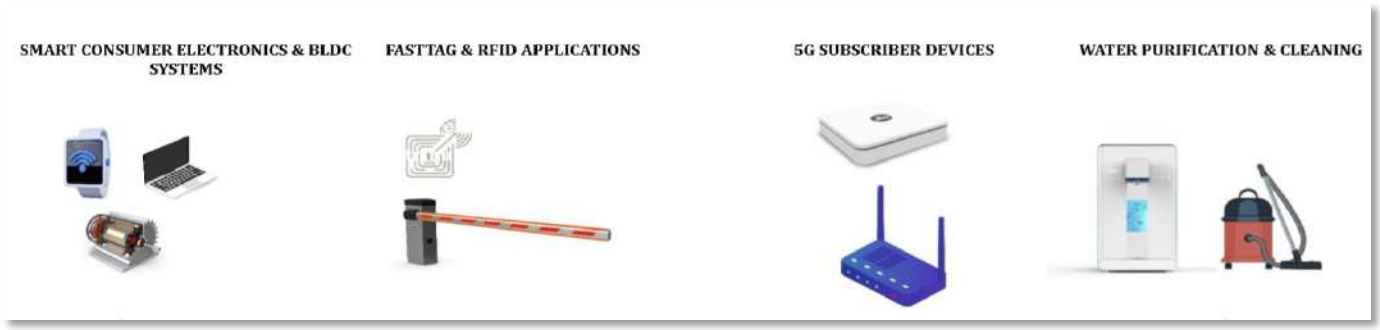
Source: Company, JM Financial

Exhibit 17. Order book to ramp up as wallet share with existing customers addition + new customers + low penetration levels.



Source: Company, JM Financial

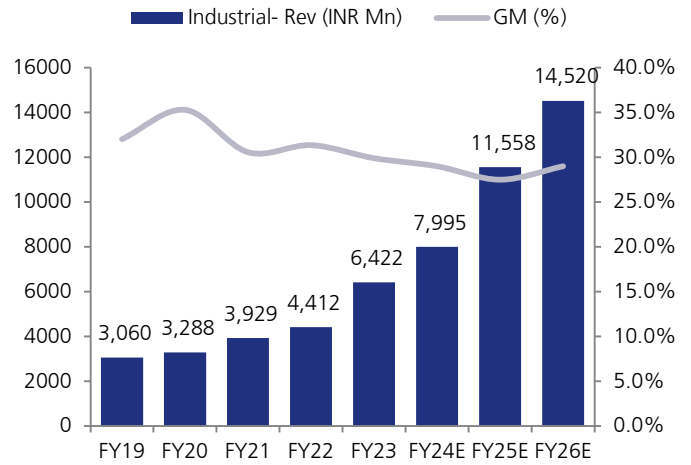
Exhibit 18. Product Offering under the Consumer Segment



Source: Company, JM Financial

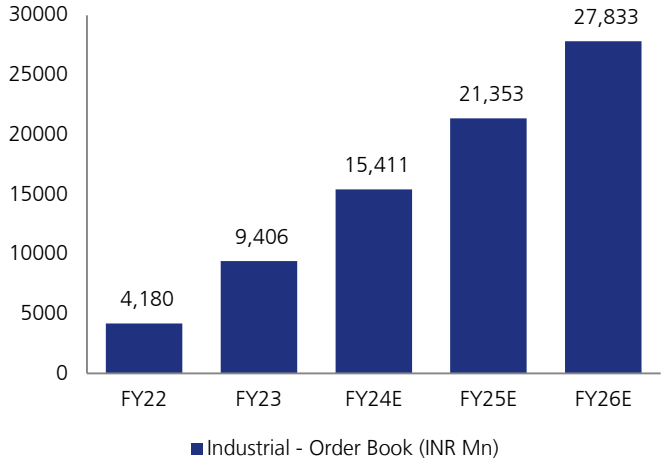
Industrial to CAGR c.31% on back of Increasing infra spends + Make in India theme + Tech boost: The segment growth will be driven by (1) Most large manufacturing companies are investing heavily in technology up gradation and digitization, (2) Expansion of PLI schemes to various sectors, development of a component ecosystem, setting up of semiconductors in India, (3) Shift towards smart meters from conventional meters, (4) Increase in export opportunity. We expect order inflow of INR 14/17.5/21bn in FY24/25/26 due to above opportunities on the table.

Exhibit 19. We expect revenue CAGR of c. 31% from FY23-26



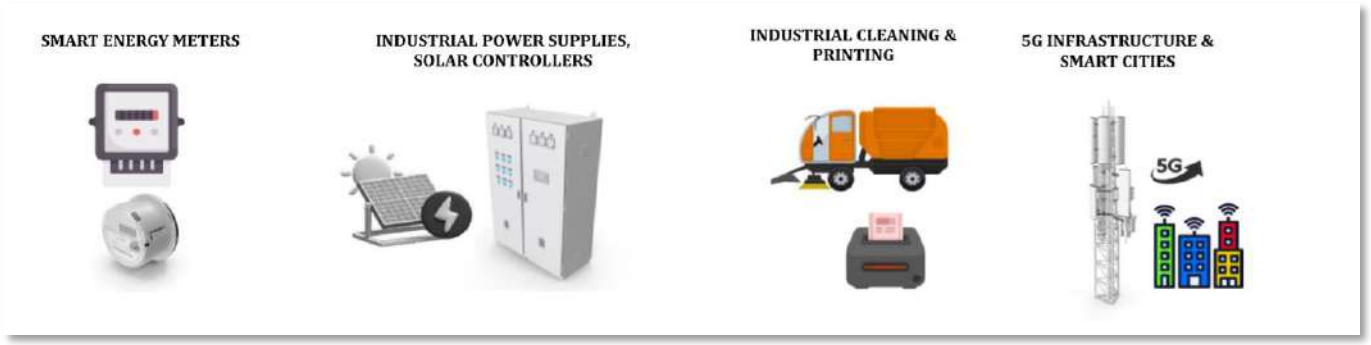
Source: Company, JM Financial

Exhibit 20. Order book to CAGR of c.44% over FY23-26



Source: Company, JM Financial

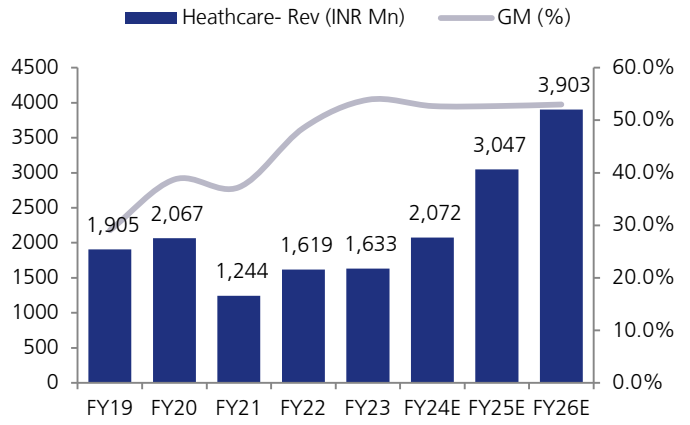
Exhibit 21. Product Offering under the Industrial Segment



Source: Company, JM Financial

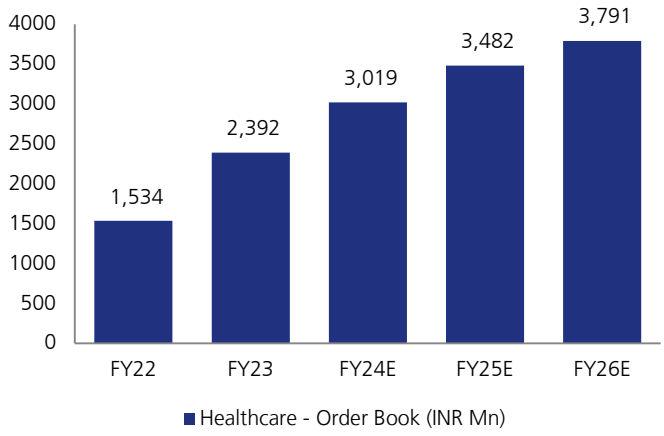
Healthcare (ex. JDHL) to CAGR c.34% over FY23-26: With development of medical infrastructure, acquisition of 51% stake in Johari Digital Healthcare Limited ("JDHL") an end to end design-led manufacturer of electro-medical devices will further add to growth. The deal with JDHL will be topline accretive by 5-7% and will add 1-1.5% to EBITDA margins. JDHL had c.14% capacity utilization in FY23 and a margin of c.30% along with Sales/Gross block of c.5x and WC of c.95 days. Management expects JDHL to grow at 20-25% over next 2-3 years.

Exhibit 22. Healthcare to CAGR of c.34% over FY23-26



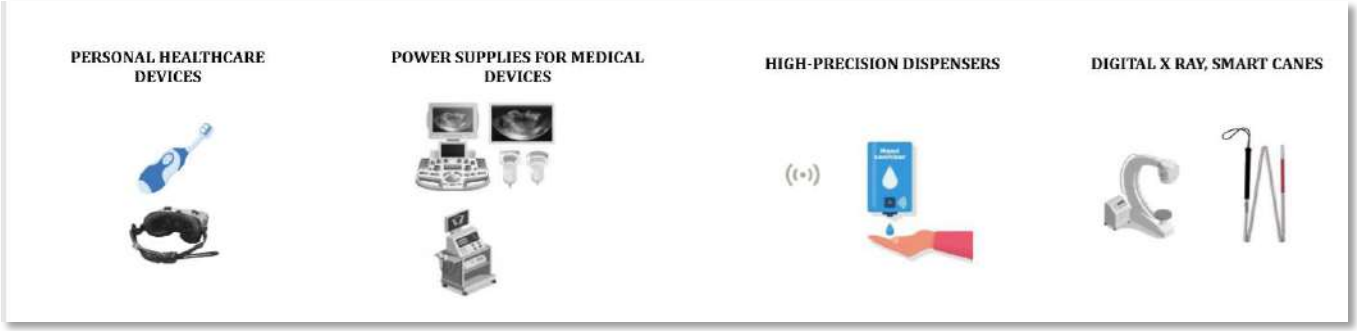
Source: Company, JM Financial

Exhibit 23. Strong order pipeline in Healthcare



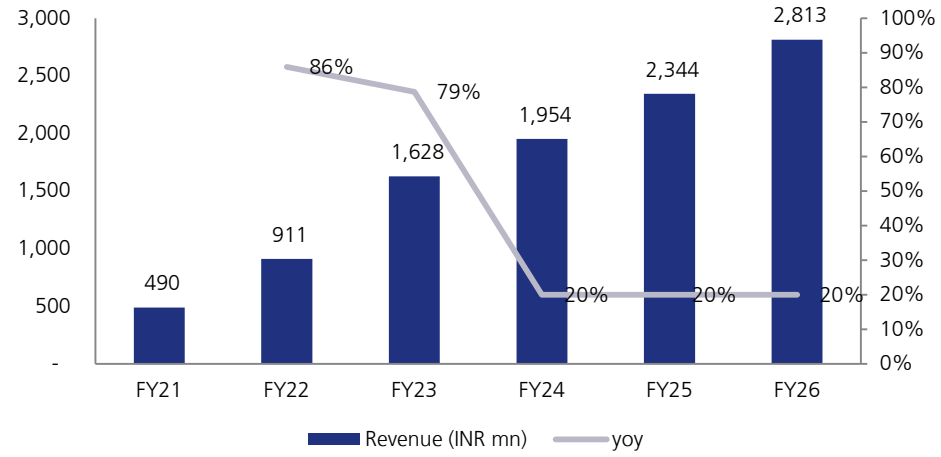
Source: Company, JM Financial

Exhibit 24. Product Offering under the Healthcare Segment



Source: Company, JM Financial

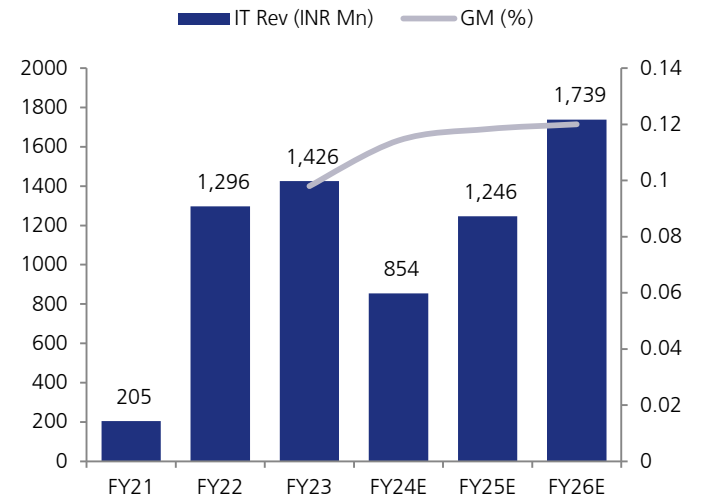
Exhibit 25. JDHL to report CAGR of 20% over FY23-26E



Source: Industry, Company, JM Financial

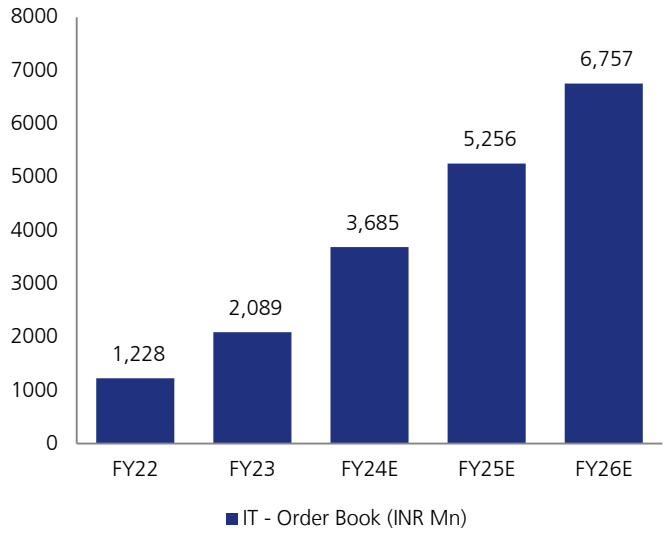
IT to CAGR c.27% over FY23-26 with IT PLI 2.0 on the cards + focus on manufacturing/smart cities: Syrma is an beneficiary in IT hardware Policy 2.0; we expect this segment to see strong order book going ahead on back of this. Also, GoI's emphasis on Smart Cities will generate massive opportunities for IoT-related capex in areas such as public safety, traffic control, and energy management will further add to growth.

Exhibit 26. IT segment to CAGR of c.27% over FY23-26, after being impacted in FY24



Source: Company, JM Financial

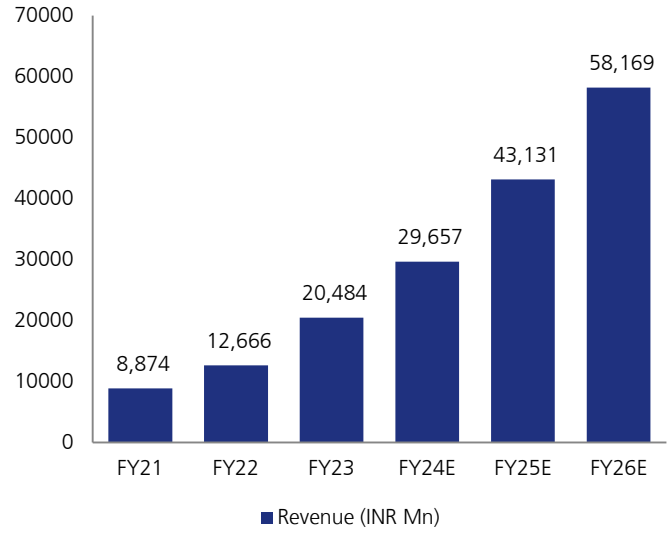
Exhibit 27. Strong order in pipeline with IT Hardware PLI 2.0 on cards



Source: Company, JM Financial

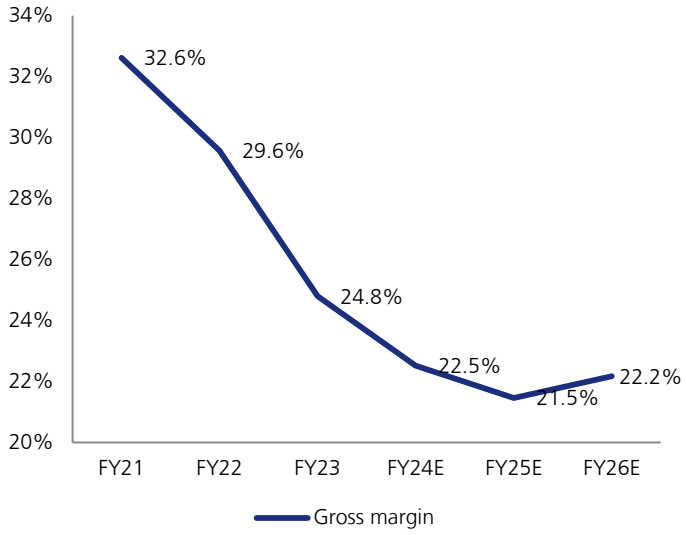
Financial Story in Charts

Exhibit 28. Syrma will see revenue CAGR of c.42% over fY23-26, due to strong growth in segments like railway, consumer, automotive and industrials



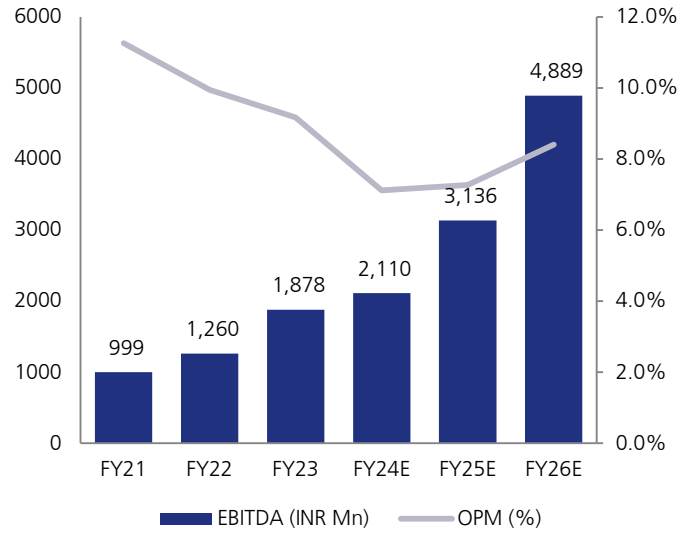
Source: Company, JM Financial

Exhibit 29. We expect gross margins pressure in short term due to high share of consumer segment. However with more focus on box-builds, increasing volume in consumer etc. GM to expand in 2-3 years



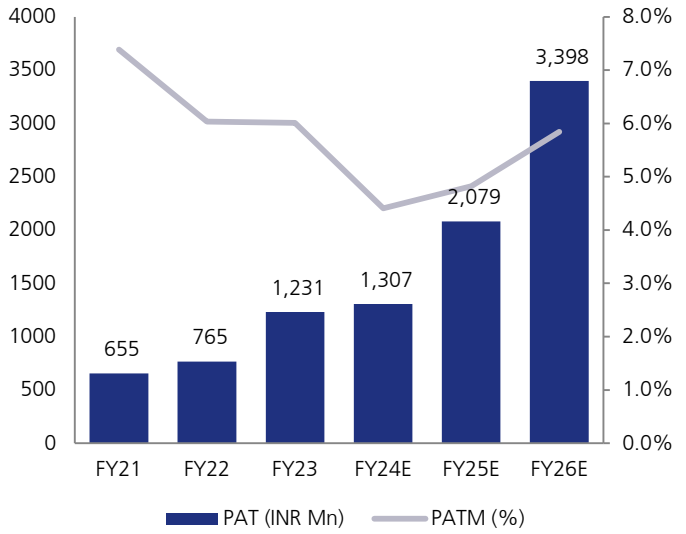
Source: Company, JM Financial

Exhibit 30. With assets reaching more optimum level of utilisation, operating leverage that will kick in will be very postive



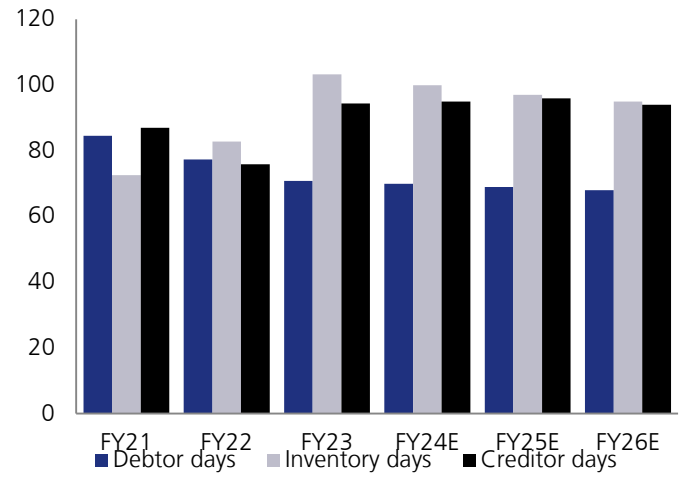
Source: Company, JM Financial

Exhibit 31. Significant jump likely in profitability led by higher volumes, better product mix and focus on debt reduction



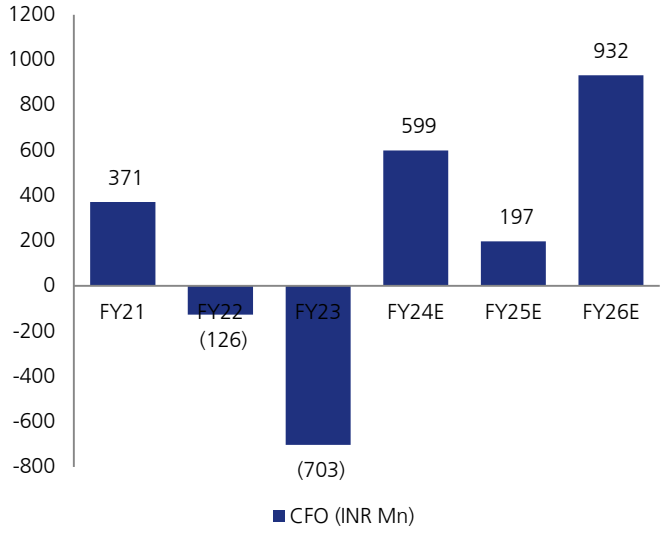
Source: Company, JM Financial

Exhibit 32. Working capital likely to fall, but big improvement will happen when the components ecosystem in India sees significant development



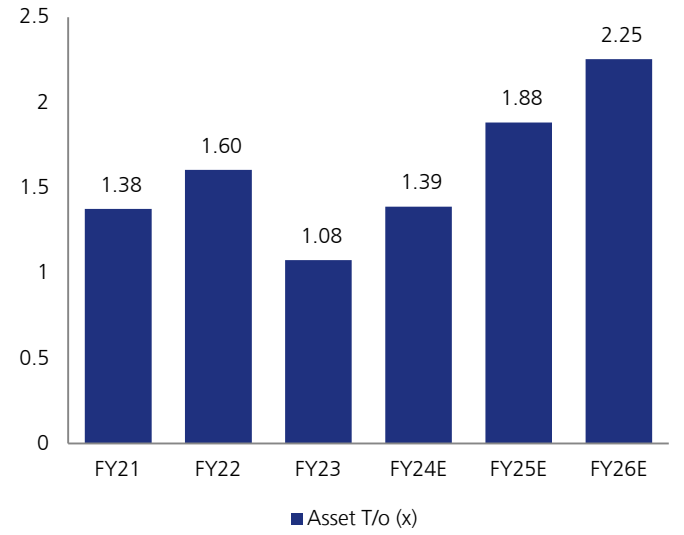
Source: Company, JM Financial

Exhibit 33. Strong profitability and working capital improvement will help generate positive cash flow



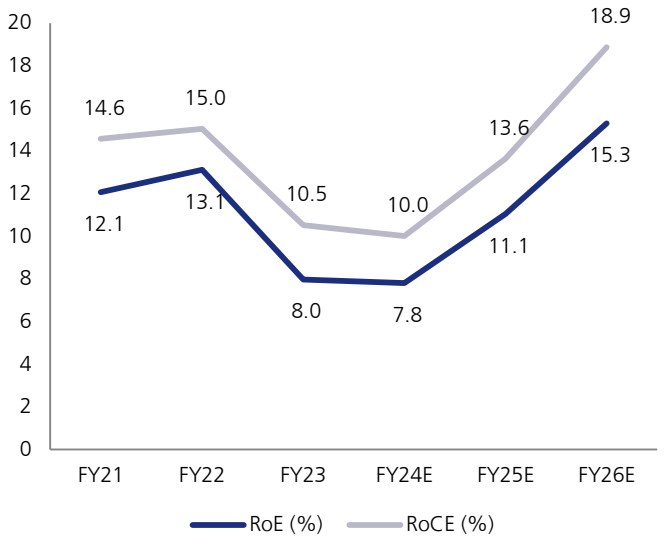
Source: Company, JM Financial

Exhibit 34. Post capex, Asset T/o to improve significantly



Source: Company, JM Financial

Exhibit 35. Improving profitability will lead to improve return ratios



Source: Company, JM Financial

Outlook & Valuation

- In short term: We expect consumer and industrial to lead growth. However, with increasing share of consumer margins to cap.
- In mid to long term: We expect Syrma SGS to report revenue/EBITDA/PAT CAGR of 40%/45%/35% over FY23-26 mainly backed by:

  (1) strong order book,

  (2) increasing customer base with rising wallet share from existing customers,

  (3) focus on technologies and innovation to increase product offerings,

  (4) entry into new business verticals (aerospace & defence, medical and railways), which will improve strong order book visibility, along with margins.

  (5) highest capacity in the industry; new capacity addition will give it an edge over peers,

  (6) favourable industry tailwinds

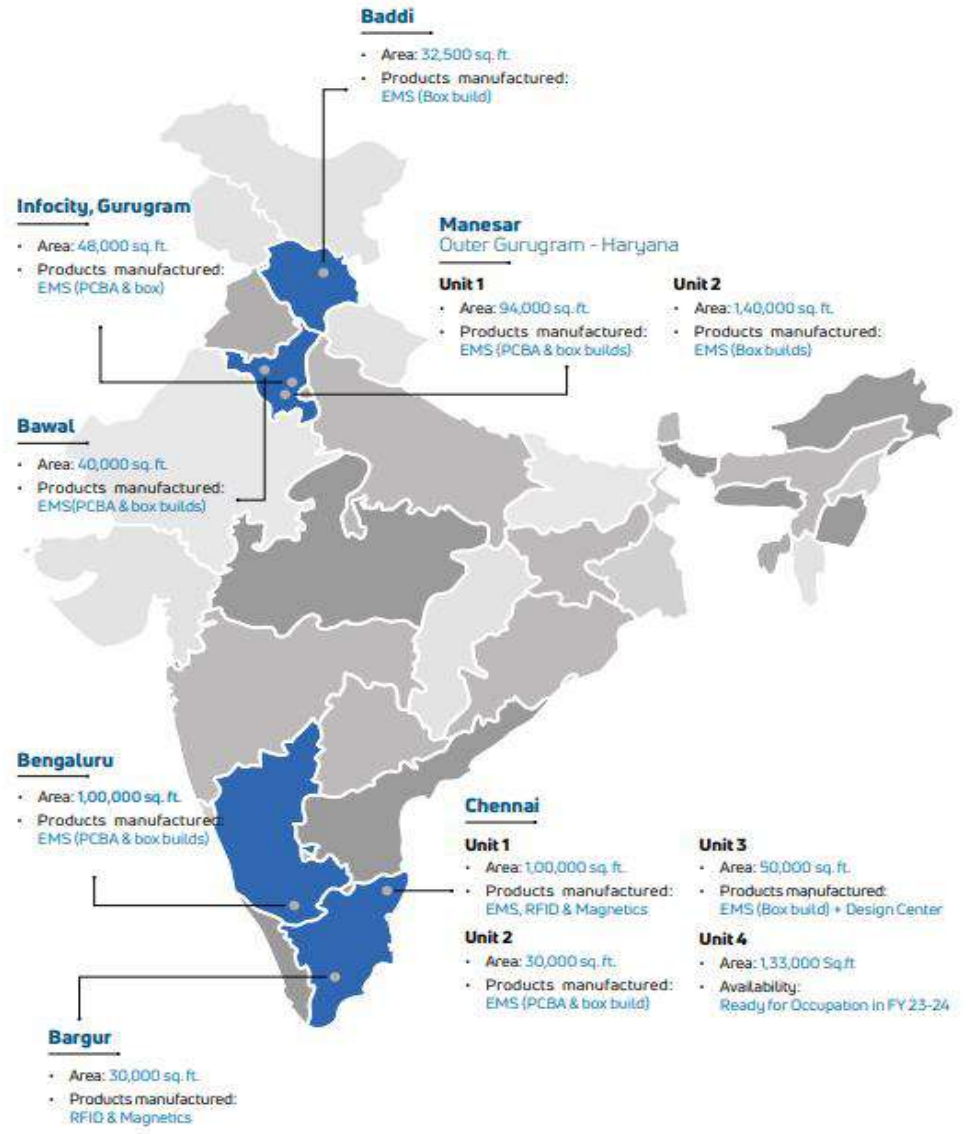
  (7) economies of scale and robust supplier network will enable better sourcing, which will help it improve working capital and profitability.

  (8) We expect over next 1-2 years Syrma will also enter in OSAT.
- Syrma will see FY24/25/26 earnings growth of c.6%/59%/63%; based on strong earning CAGR, improving returns ratios, and improved working capital visibility, we value the company at 35x its FY26 EPS. **We initiate coverage with a BUY rating and a target price of INR 675.**

Company overview

Syrma SGS Technology Ltd (Syrma) was founded in 1978 by the Tandon family in San Jose and Chennai for developing quality technology products. It is one of India's largest exporters of electronics, providing high-value integrated design and product solutions for OEMs. Syrma SGS's business model starts from product concept design and focuses on every segment of the overall industry value chain. It is a leader in high-margin low-volume product management and is present in most industry verticals. It operates in consumer electronics and appliances, telecommunications, automotive and industrial segments and is planning to diversify into aerospace and defence, which at present contribute to less than 2% of its overall revenue. It has 26 SMT lines operational and four more are in the pipeline.

Exhibit 36. Manufacturing location



Source: Company, JM Financial

Exhibit 37. Management Profiles

Name	Designation	Education	Experience
Sandeep Tandon	Executive Chairman	• Bachelor of Science in electrical engineering from University of South Carolina • YPO President's Program from the Harvard Business School	• 18+ years of experience in the EMS space • Previously with Celetronix Inc., USA • Board member at CRED, Chairman of the Board at Aavas Financiers and member of the Board of Advisors at IIFL Investment Managers
Jasbir Singh Gujral	Managing Director	• Bachelor of Commerce from University of Delhi	• 39+ years of experience in the EMS space • Fellow member of the ICAI
Sreeram Srinivasan	Chief Executive Officer	• B. Tech in metallurgical engineering from IIT Madras • MS and PhD from North Carolina State University	• 20+ years of experience in business operations • Looks after operations and business strategy. • Previously VP (Operations) of Rane Engine Valves for 4 years • President and ED of Shanti gears for 3 years • MD of Saint Gobain Sekurit India for 7 years • CEO of MTAR technologies • He is on the Board of IESA (Indian Semiconductor and Electronics Association)
Bijay Kumar Agrawal	Chief Financial Officer	• Bachelor of Commerce from P.N. College, Khurda, Utkal University • MBA from the ICFAI University.	• 16+ years of experience in finance, banking, treasury, M&As, IPOs, PE, fund raising and business strategy • Previously associated with Manpower Services India, Dalmia Bharat and Omax Autos

Source: Company, JM Financial

Financial Tables (Consolidated)

Income Statement (INR mn)

Y/E March	FY22A	FY23A	FY24E	FY25E	FY26E
Net Sales	12,666	20,484	29,657	43,131	58,169
Sales Growth	42.7%	61.7%	44.8%	45.4%	34.9%
Other Operating Income	0	0	0	0	0
Total Revenue	**12,666**	**20,484**	**29,657**	**43,131**	**58,169**
Cost of Goods Sold/Op. Exp	8,921	15,405	22,979	33,874	45,269
Personnel Cost	750	1,060	1,424	1,851	2,369
Other Expenses	1,735	2,142	3,144	4,270	5,642
EBITDA	**1,260**	**1,878**	**2,110**	**3,136**	**4,889**
EBITDA Margin	9.9%	9.2%	7.1%	7.3%	8.4%
EBITDA Growth	26.1%	49.0%	12.4%	48.6%	55.9%
Depn. & Amort.	249	312	498	508	519
EBIT	1,010	1,566	1,613	2,628	4,370
Other Income	177	437	525	500	500
Finance Cost	80	216	357	317	277
PBT before Excep. & Forex	1,108	1,787	1,780	2,811	4,593
Excep. & Forex Inc./Loss(-)	0	0	-14	0	0
PBT	1,108	1,787	1,767	2,811	4,593
Taxes	343	556	459	731	1,194
Extraordinary Inc./Loss(-)	0	0	0	0	0
Assoc. Profit/Min. Int.(-)	0	0	0	0	0
Reported Net Profit	764	1,231	1,307	2,080	3,399
Adjusted Net Profit	**764**	**1,231**	**1,307**	**2,080**	**3,399**
Net Margin	6.0%	6.0%	4.4%	4.8%	5.8%
Diluted Share Cap. (mn)	176.2	176.8	176.8	176.8	176.8
Diluted EPS (INR)	**4.3**	**7.0**	**7.4**	**11.8**	**19.2**
Diluted EPS Growth	16.5%	60.5%	6.2%	59.1%	63.4%
Total Dividend + Tax	0	0	0	0	0
Dividend Per Share (INR)	0.0	0.0	0.0	0.0	0.0

Source: Company, JM Financial

Balance Sheet (INR mn)

Y/E March	FY22A	FY23A	FY24E	FY25E	FY26E
Shareholders' Fund	5,721	15,403	16,710	18,789	22,187
Share Capital	1,376	1,768	1,768	1,768	1,768
Reserves & Surplus	4,344	13,635	14,942	17,021	20,419
Preference Share Capital	0	0	0	0	0
Minority Interest	108	26	26	26	26
Total Loans	1,942	3,468	4,468	3,968	3,468
Def. Tax Liab. / Assets (-)	124	138	138	138	138
Total - Equity & Liab.	**7,895**	**19,035**	**21,342**	**22,921**	**25,819**
Net Fixed Assets	4,187	5,577	9,839	10,531	10,713
Gross Fixed Assets	4,464	6,304	11,063	12,263	12,963
Intangible Assets	0	0	0	0	0
Less: Depn. & Amort.	668	980	1,478	1,985	2,504
Capital WIP	391	253	253	253	253
Investments	410	840	840	840	840
Current Assets	6,945	18,994	20,098	24,660	31,064
Inventories	2,913	5,874	8,238	11,621	15,350
Sundry Debtors	2,722	4,032	5,767	8,267	10,988
Cash & Bank Balances	369	544	3,796	2,475	2,429
Loans & Advances	0	0	0	0	0
Other Current Assets	940	8,543	2,298	2,298	2,298
Current Liab. & Prov.	3,647	6,377	9,436	13,111	16,798
Current Liabilities	2,405	4,881	7,940	11,615	15,302
Provisions & Others	1,243	1,496	1,496	1,496	1,496
Net Current Assets	3,298	12,617	10,662	11,549	14,266
Total – Assets	**7,895**	**19,035**	**21,341**	**22,921**	**25,819**

Source: Company, JM Financial

Cash Flow Statement (INR mn)

Y/E March	FY22A	FY23A	FY24E	FY25E	FY26E
Profit before Tax	1,108	1,787	1,767	2,811	4,593
Depn. & Amort.	249	312	498	508	519
Net Interest Exp. / Inc. (-)	54	-222	-168	-183	-223
Inc (-) / Dec in WCap.	-1,212	-2,140	-1,039	-2,208	-2,763
Others	-36	116	0	0	0
Taxes Paid	-289	-556	-459	-731	-1,194
Operating Cash Flow	**-126**	**-703**	**599**	**197**	**932**
Capex	-901	-1,839	-4,760	-1,200	-700
Free Cash Flow	-1,027	-2,542	-4,161	-1,003	232
Inc (-) / Dec in Investments	-3,102	-7,743	6,245	0	0
Others	12	437	525	499	499
Investing Cash Flow	**-3,992**	**-9,145**	**2,010**	**-701**	**-201**
Inc / Dec (-) in Capital	2,715	7,660	0	0	0
Dividend + Tax thereon	0	0	0	0	0
Inc / Dec (-) in Loans	994	1,526	1,000	-500	-500
Others	112	781	-357	-317	-277
Financing Cash Flow	**3,821**	**9,967**	**643**	**-817**	**-777**
Inc / Dec (-) in Cash	**-296**	**120**	**3,252**	**-1,321**	**-46**
Opening Cash Balance	666	424	544	3,796	2,475
Closing Cash Balance	369	544	3,796	2,475	2,429

Source: Company, JM Financial

Dupont Analysis

Y/E March	FY22A	FY23A	FY24E	FY25E	FY26E
Net Margin	6.0%	6.0%	4.4%	4.8%	5.8%
Asset Turnover (x)	1.8	1.5	1.5	2.0	2.4
Leverage Factor (x)	1.3	1.3	1.2	1.2	1.2
RoE	13.8%	11.7%	8.1%	11.7%	16.6%

Key Ratios

Y/E March	FY22A	FY23A	FY24E	FY25E	FY26E
BV/Share (INR)	32.5	87.1	94.5	106.3	125.5
ROIC	11.4%	8.8%	7.0%	10.8%	15.4%
ROE	13.8%	11.7%	8.1%	11.7%	16.6%
Net Debt/Equity (x)	0.2	0.1	0.0	0.0	0.0
P/E (x)	121.0	75.4	71.0	44.6	27.3
P/B (x)	16.2	6.0	5.6	4.9	4.2
EV/EBITDA (x)	74.8	50.6	44.0	29.9	19.1
EV/Sales (x)	7.4	4.6	3.1	2.2	1.6
Debtor days	78	72	71	70	69
Inventory days	84	105	101	98	96
Creditor days	77	96	105	106	105

Source: Company, JM Financial

Cyient DLM | BUY

Aero & Defence in focus; margins to soar

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Cyient DLM is a leading integrated EMS and solutions provider with capabilities across the value chain. It has 22+ years of experience in developing high-mix low-volume highly complex systems and is a qualified supplier to major global OEMs in aerospace & defence, industrials, and medical technology. Its offers B2P (Build to Print) and B2S (Build to Specification). Its primary offerings include: (1) PCBA, (2) cable harnesses, and (3) box builds. Cyient has seen revenue CAGR of 22% over FY20-23. It has industry leading order to bill of 2.9x as of FY23. We expect revenue/earnings CAGR of 37%/73% over FY23-26E backed by strong uptick across industry segments and a robust order book of INR 22.9bn as on 9MFY24 executable over the next 18-24 months.

- **Unique sub-segments create high entry barriers with high customer stickiness:** Cyient DLM specialises in providing electronics solutions for safety and mission-critical applications, setting it apart from its competitors. Cyient has c.35 customer as on FY23 with order book from top 10customers reachin c.96% which shows high customer stickiness and higher opportunity of repeat business. Also, global leading customers are continuously increasing share with Cyient (under China +1 strategy).
- **Growth to be cater by Asset sweating :** With three manufacturing facilities operating at less than 50%, Cyient DLM is poised to capitalise on a favourable industry environment and growing wallet share from its existing customers. With better utilisation, Cyient will see operating leverage will support margins. It already has an industry leading order book of INR 22.9bn, which we expect will see a CAGR of 42% over the next 2 years.
- **Exports is a major area; will explore domestic opportunities:** Export revenue CAGR of 47% over FY21-23 and contributed 60% of its overall revenue in FY23. With great opportunities opening up in aerospace (Cyient's DLM expertise area) and other industries in India, Cyient will also start exploring domestic clients.
- **Harnessing the power of parentage:** Cyient DLM strategically leverages its parentage (Cyient Ltd, a global engineering and technology solutions company) to unlock the high-margin capabilities of Original Design Manufacturing (ODM)/ Build-to-Specification (B2S) services. While it has a small share of overall revenue at present, its CAGR is at 35%. We anticipate improved mix of these services leading to an increase in both revenue and margins.
- **Initiate with BUY: with TP of INR 925:** Over the next 2-3 years, Cyient DLM will see strong revenue growth led by: Strong order book of c.INR 24bn, which is 3x FY23 + Customer stickiness will provide higher revenue visibility + available capacities + Its expanding value-added segment, plus move towards OSAT (JMFe), which will add to margins and revenue + higher A&D portfolio making it an expert player in the industry + increasing customer concentration, which means high focus on value-added customers, and Strong industry tailwinds. Revenue/EBITDA/PAT to report CAGR of 37%/40%/73% over FY23-26E with OPM of 9.9%/11.2% in FY25/26E. Based on this, robust order book, high earning CAGR, and improved working capital, we value Cyient DLM at 45x on FY26E EPS. Hence, we initiate coverage with a BUY rating and a target price of INR 925.

Recommendation and Price Target	
Current Reco.	BUY
Previous Reco.	NA
Current Price Target (12M)	925
Upside/(Downside)	10.2%
Previous Price Target	NA
Change	NA

Key Data – CYIENTDL IN	
Current Market Price	INR839
Market cap (bn)	INR66.6/US$0.8
Free Float	30%
Shares in issue (mn)	79.3
Diluted share (mn)	79.3
3-mon avg daily val (mn)	INR273.4/US$3.3
52-week range	845/401
Sensex/Nifty	73,143/22,213
INR/US$	82.9

Price Performance			
%	1M	6M	12M
Absolute	23.5	46.1	0.0
Relative*	19.4	29.6	0.0

* To the BSE Sensex

Financial Summary					(INR mn)
Y/E March	FY22A	FY23A	FY24E	FY25E	FY26E
Net Sales	7,205	8,320	12,052	16,174	21,590
Sales Growth (%)	14.7	15.5	44.9	34.2	33.5
EBITDA	840	878	1,105	1,609	2,428
EBITDA Margin (%)	11.7	10.5	9.2	9.9	11.2
Adjusted Net Profit	398	317	630	1,025	1,630
Diluted EPS (INR)	7.5	6.0	7.9	12.9	20.6
Diluted EPS Growth (%)	237	-20	32	63	59
ROIC (%)	20.9	20.0	22.7	26.6	34.6
ROE (%)	69.4	23.1	10.9	10.1	14.2
P/E (x)	111.5	139.9	105.7	64.9	40.8
P/B (x)	1.5	22.4	6.9	6.3	5.4
EV/EBITDA (x)	80.9	77.2	55.3	38.1	25.0
Dividend Yield (%)	0.0	0.0	0.0	0.0	0.0

Source: Company data, JM Financial. Note: Valuations as of 23/Feb/2024

JM Financial Research is also available on:
Bloomberg - JMFR <GO>,
Thomson Publisher & Reuters,
S&P Capital IQ, FactSet and Visible Alpha

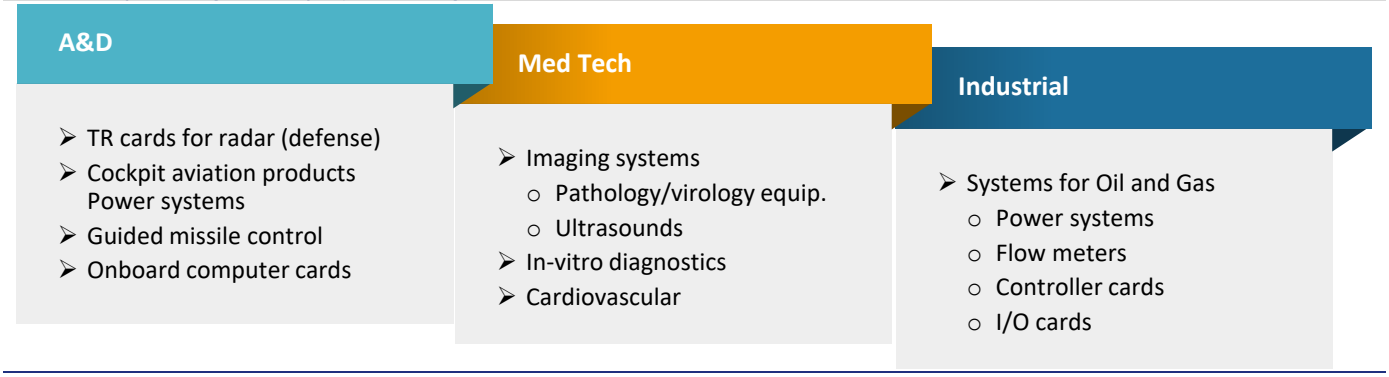
Please see Appendix I at the end of this report for Important Disclosures and Disclaimers and Research Analyst Certification.

Customer base acts as a high entry barrier

Cyient DLM specialises in serving a broad spectrum of highly regulated industries, including aerospace and defence (A&D), medical technology, and industrial sectors that demand strict requirements and certifications. While competitors also cater to these segments, Cyient's unique focus within these sub-segments sets it apart and provides a competitive advantage by creating barriers to entry.

In A&D, Cyient DLM caters to highly complex, safety-critical electronics such as cockpit systems and flight control systems

Exhibit 1.Key offerings for major product segments



Source: Company, JM Financial

High customer stickiness

In sub-segments characterised by high complexity and criticality, customer loyalty becomes paramount. Customers in these industries exhibit a strong inclination to maintain long-term relationships with trusted partners. The selection process for such partnerships is rigorous and time-consuming, involving a comprehensive evaluation of the manufacturer's expertise, manufacturing facilities, processes, financial capabilities, and logistical capabilities.

For Cyient, the customer acquisition process typically spans 6 to 12 months

Exhibit 2.Key customers, their nature and contribution to overall revenue from FY21-23

Key customers	Segment	Number of years of relationship*	FY21	FY22	FY23
ABB	Industrial	14	431	786	1,794
as a % of sales			6.9%	10.9%	21.8%
Bharat Electronics	A&D	12	867	1,086	887
as a % of sales			13.8%	15.1%	10.7%
Honeywell International	A&D	14	540	539	747
as a % of sales			8.6%	7.5%	9.0%
Thales Global Services	A&D	8	639	693	1,046
as a % of sales			10.2%	9.6%	12.6%
Molbio diagnostics	Medical Technology	10	1,031	515	241
as a % of sales			16.4%	7.2%	2.9%
Total	-	-	**3,509**	**3,619**	**4,715**
as a % of sales	-	-	**55.9%**	**50.2%**	**56.7%**

Source: Company, JM Financial Note*As of March 31, 2023

ABB's contribution increased substantially between FY21 and FY23

Bharat Electronics' contribution fluctuated, but remained substantial

Molbio Diagnostics' share decreased significantly over FY21-23

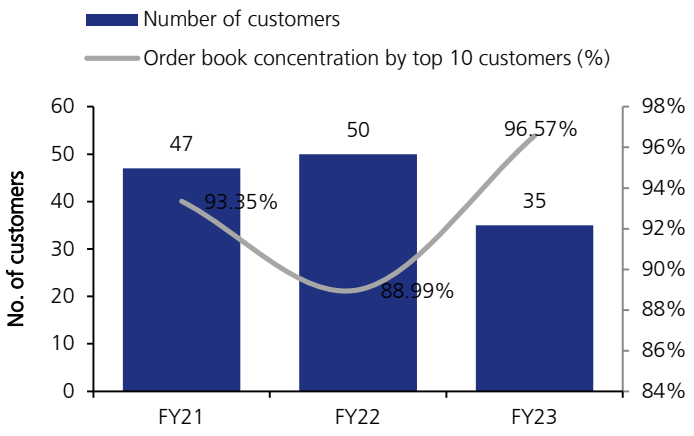
As a strategic partner to clients across highly regulated industries, Cyient DLM enjoys long-term relationships, with high customer stickiness and a great proportion of repeat business, which allows it to have revenue visibility and a stable client base. The repeat contracts from customer are a substantial portion of its business at almost its entire revenue in FY23.

Cyient's contract with Honeywell International Inc. is for more than 15 years

Reducing a long tail of customers

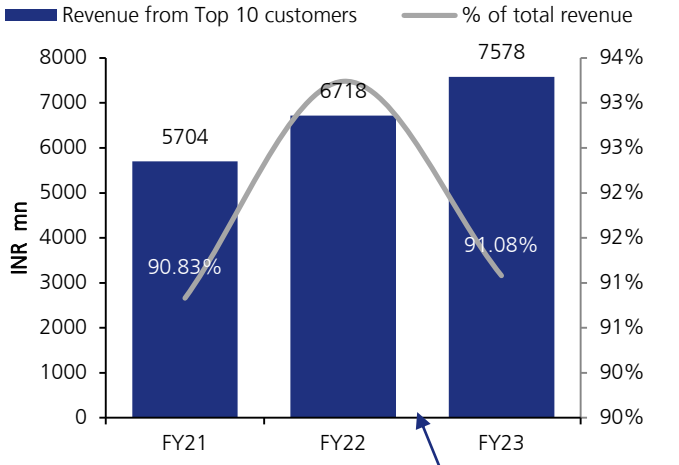
Cyient has demonstrated a clear focus on reducing its long tail of customers by placing emphasis on cultivating relationships with strategic and marquee clients. The company's objective is to build long-term partnerships, as reflected in the contractual agreements with clients that typically extend between 3 years and more than 15 years.

Exhibit 3.Number of customers (35 in FY23 vs. 47 in FY21). But customer concentration has increased significantly



Source: Company, JM Financial

Exhibit 4.Revenue share from top-10 customers



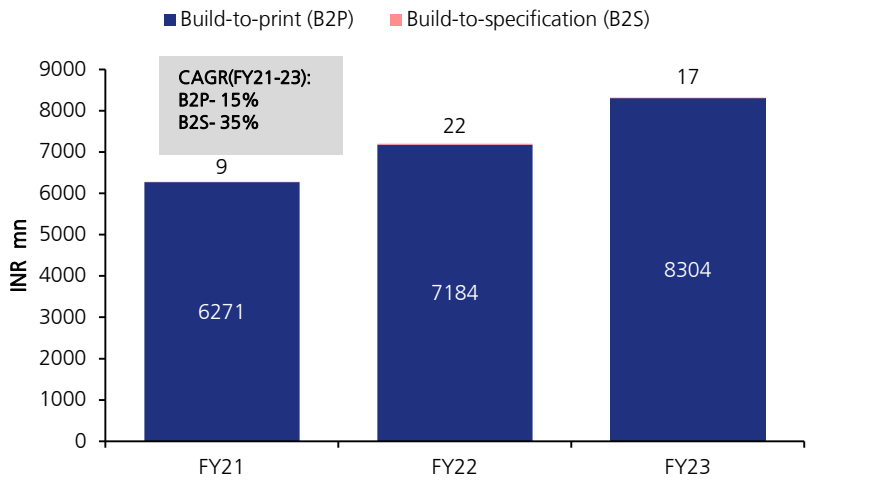
Source: Company, JM Financial

Revenue contribution from top 10 customers is highest for Cyient DLM as compared to its peers

Focusing on being an end-to-end integrated EMS player

Earlier, Cyient DLM used to perform build to print (B2P) services in which clients provided the designs and it manufactured them as per the customer's specifications. Now its focus has strategically shifted to being an integrated EMS player offering build to specification (B2S) services as well. Cyient provides a complete range of services – product engineering, design and build services; basically, from concept to qualification.

Exhibit 5.B2P and B2S split in total revenue; B2S CAGR at 35% over FY21-23 vs. B2P at 15%



Source: Company, JM Financial

We expect increasing revenue in B2S will lead to new customer addition/ new product addition/ new opportunity for the business and result in strong growth over next 2-3 years

Cyient DLM has tremendous upside potential in the B2S business because of parental support in providing a design team

Plans to establish its own design competency to raise its margins

Cyient DLM is strategically focused on strengthening its engineering competency to augment its existing range of build-to-specification (B2S) services. Currently, B2S services benefit from the design capabilities of its parent, Cyient Limited, and its dedicated design team. However, Cyient DLM has plans to establish its own design competency, which will enhance its margin profile. In the interim, it aims to leverage the parent's design team to offer diverse solutions to customers and target new clientele.

Building scale across industries

Cyient expects to develop capabilities across industry segments by gaining wallet share with existing customers and acquiring more strategic clients. It will gain by augmenting its core capabilities and building scale by taking advantage of global players shifting their supply chains to India and setting up manufacturing facilities in India by leveraging cost advantages under various government schemes. It will continue to strengthen its position in A&D, medical and industrial segments. It will look to build scale and undertake strategic projects, thus enhancing its order book.

Cyient will look to increase share of B2S contracts and complex assemblies in overall mix, which will garner higher margins

Manufacturing capabilities – can scale up its revenue 3x

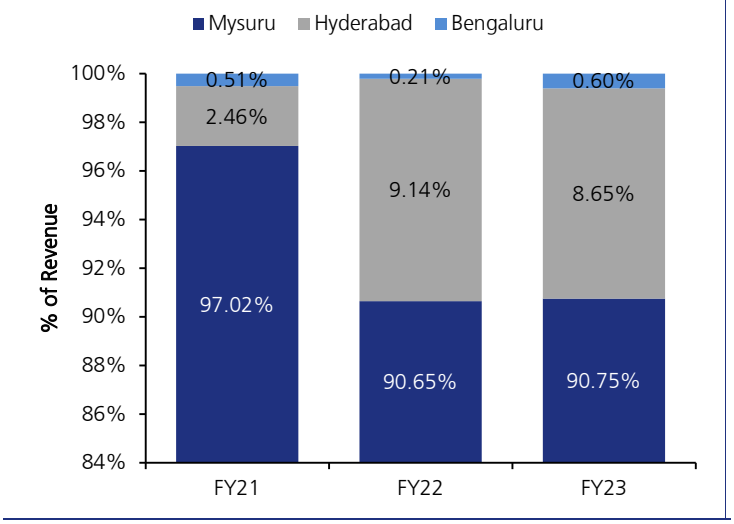
- Cyient DLM has three manufacturing facilities located at Mysuru, Hyderabad, and Bengaluru.
- Mysuru and Hyderabad have a total of six Surface Mount Technology (SMT) lines and four plated through hole (PTH), which are core processes for the assembly of PCBs.
- The facilities operate in two shifts per day, with the option of increasing that to three shifts per day in order to increase productivity.

PCBA has consistently accounted for the majority of revenue, with steady revenue growth. The contribution of cable harness and Box builds is still small, and both experienced gradual growth

Currently, a significant portion of Cyient's contribution is attributed to the Mysuru facility, operating at c.38% capacity for PCBA and only around 3% for cable harness. Cyient already has the necessary capacity to scale up revenue in response to favourable industry trends – a key advantage.

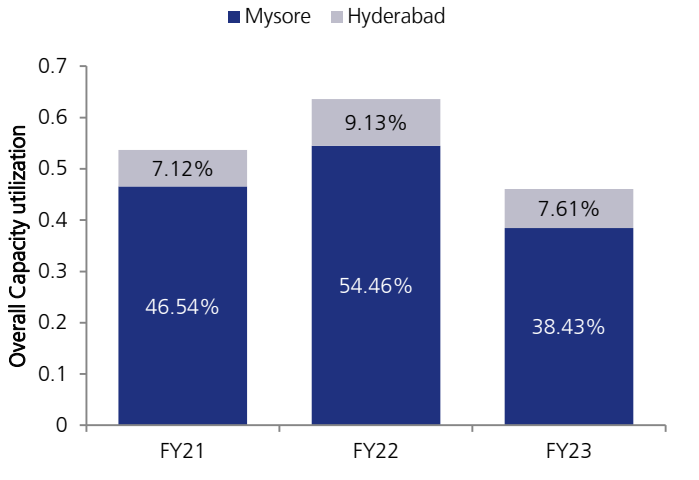
It plans on enhancing efficiency of manufacturing operations by increasing focus on digitalisation and automation, resulting in increased operational efficiency and more agility and flexibility to its clients.

Exhibit 6.Revenue contribution from manufacturing facilities



Source: Company, JM Financial

Exhibit 7.Yet to reach 50% capacity utilisation, available capacity will support growth

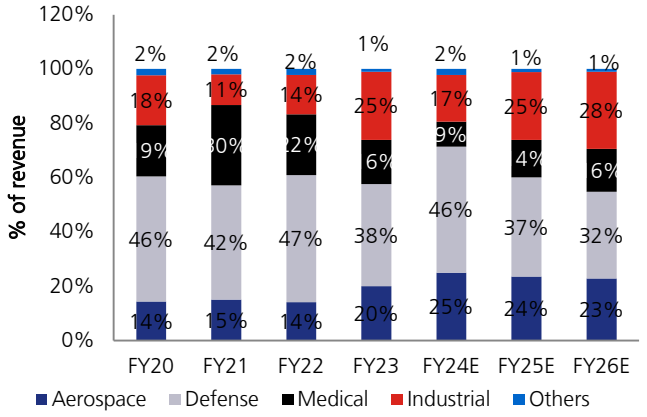


Source: Company, JM Financial

Segmental wise analysis

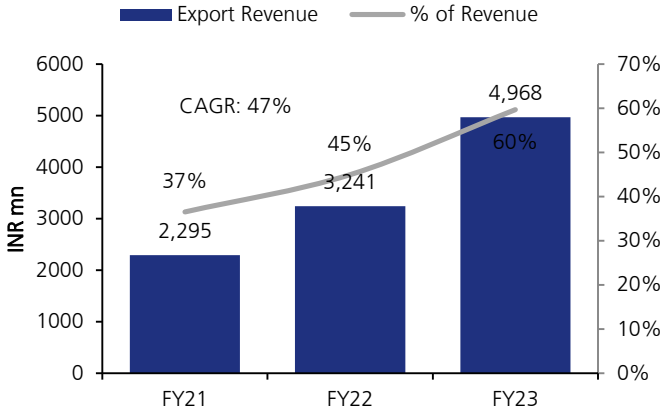
Cyient has presence across industry verticals and provides services to major global OEMs from countries such as USA, France and Israel.

Exhibit 8.Industry mix from FY20-26; we expect contribution from aerospace and industrial to increase



Source: Company, JM Financial

Exhibit 9.We expect export to continue to be a major contributor in overall revenue



Source: Company, JM Financial

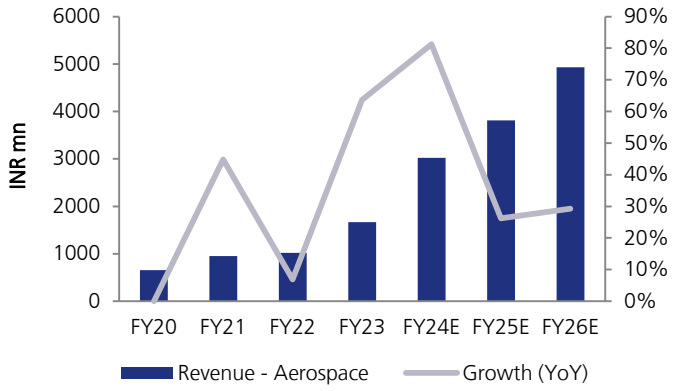
1. Aerospace and defence, 58% of revenue: strong industry tailwinds

- Cyient DLM has won a large order worth INR 7bn from BEL in the defence segment in FY23. Leading commercial aerospace companies such as Boeing, Raytheon, Collins, and SpaceX, as well as emerging drone start-ups will provide growth in the mid-to-long term for Cyient.
- Cyient's A&D practice has been rated in the leadership zone by the Zinnov Zones for product engineering services report for 5 consecutive years.
- According to Airbus and Boeing, India will require over 2,200 new aircraft over the next 20 years to meet demand. Because of its unprecedented growth, electronics has emerged as a strategic and profitable industry in the aerospace segment.
- Aerospace revenue should grow by 44% CAGR over the next 2 years to INR 3.8bn/4.9bn in FY25/26 with gross margin at 17% in FY25/26 and order CAGR at 31% over FY23-26.
- We expect defence revenue to see CAGR of 30% over the next 2 years to reach INR 5.9bn/6.9bn in FY25/26 with gross margin at 23% in FY25/26 and order book CAGR of 17% over FY23-26.

Key clients include Bharat electronics, Honeywell international and Thales global services. Each of them contributing 11%, 9% and 13% of overall revenue respectively

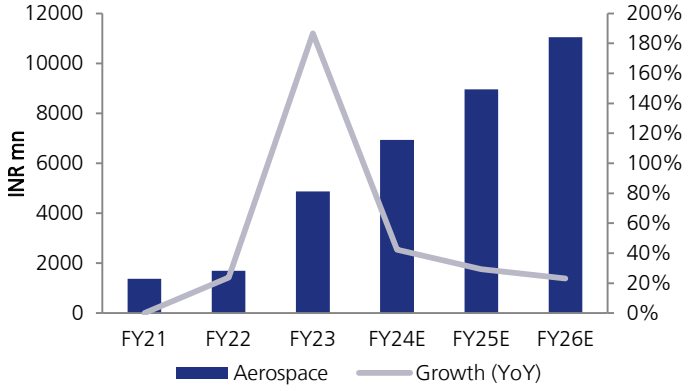
Further, Bharat electronics has grown its revenue at CAGR of 12% over FY23-17 to reach INR 1,80,152mn

Exhibit 10.Aerospace revenue CAGR of 44% over FY23-26E



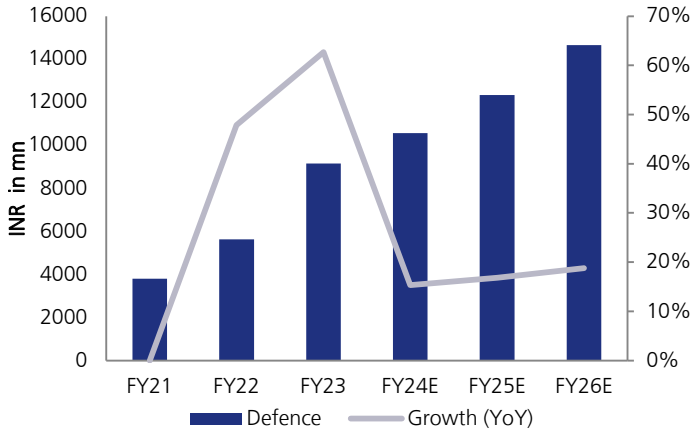
Source: Company, JM Financial

Exhibit 11.Aerospace order book CAGR of 31% over FY23-25E



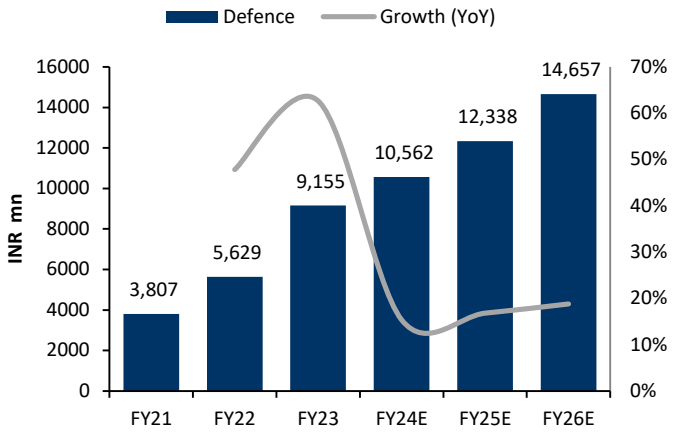
Source: Company, JM Financial

Exhibit 12. Defence revenue CAGR of 30% over FY23-26E



Source: Company, JM Financial

Exhibit 13.Defence order book CAGR of 17% over FY23-26E



Source: Company, JM Financial

2. Industrial, 25% of revenue: riding on manufacturing theme

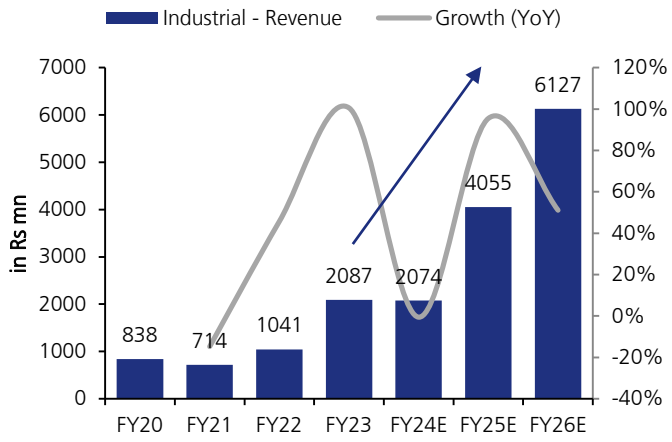
- Industrial electronics generally refers to the use of electronics for power and control systems, outside of the field of communications.
- Most large manufacturing companies are investing heavily in the technological upgradation of their facilities by adopting digitisation and industry 4.0 concepts. This will increase demand for industrial electronics products, which, in turn, will boost the EMS industry.
- India is an attractive hub for foreign investments in the manufacturing sector. Several brands have set up or are looking to establish their manufacturing bases in the country. The manufacturing sector of India has the potential to reach USD 1trln by FY25. Cyient DLM has the manufacturing capability to capitalise on industrial digitalisation and increase the share of industrials in its revenue mix
- We expect industrials revenue to rise at a CAGR of 43% to INR 4.0bn/6.1bn in FY25/26 with gross margin at 29% and order book CAGR of 44%.

Key client includes ABB Inc. contributing a significant share of 21% of overall revenue

Key drivers for growth:

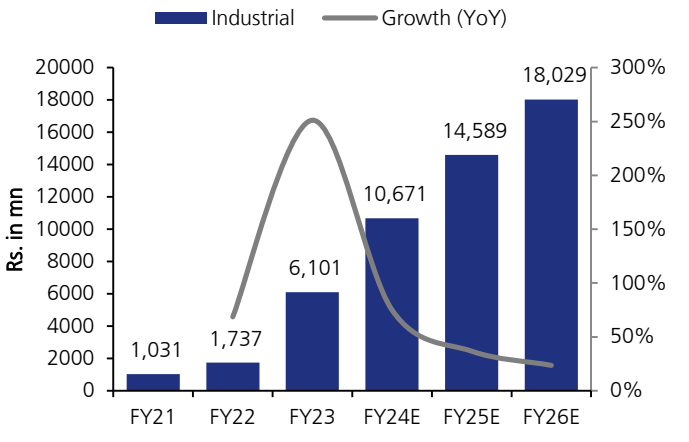
- Government mission to increase EV penetration
- Fame II scheme extended until 2024
- Semiconductor manufacturing scheme
- An increase in demand for digital technologies and smart solutions from process industries

Exhibit 14.Industrials revenue CAGR of 43% over FY23-26E



Source: Company, JM Financial

Exhibit 15.Order book CAGR of 44% over FY23-26E



Source: Company, JM Financial

3. Medical, 16% of revenue: Expect to start witnessing growth from FY25

- The adoption of negligibly invasive surgery methods, increasing acceptance of surgical robots, and the gradual shift of some procedures to outpatient settings will continue to drive the uptake in some medical-devices categories, including consumables.
- Currently, EMS companies are pursuing the hugely under-penetrated medical electronics market in India for substantial growth opportunities. Cyient offers products and services in patient-care monitoring systems and diagnostics equipment.
- Most new medical companies are like new communications equipment companies – they are disinclined to manufacture products they design and prefer to partner with an EMS supplier – so this segment is usually very promising for EMS.
- For Cyient, we expect revenue of INR 2.2bn/3.4bn in FY25/FY26 with gross margin of 26% and order book CAGR of 24%.

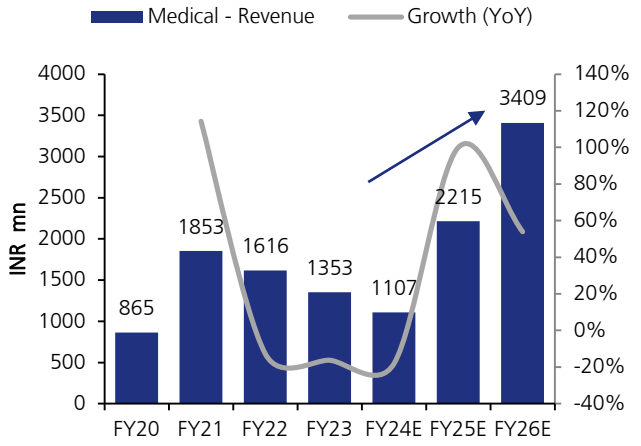
Key clients include Molbio diagnostics pvt. Ltd. contributing 3% of overall revenue

Mobio has seen CAGR of 324% over FY 17-21 to reach INR 12,735mn

Key drivers for growth:

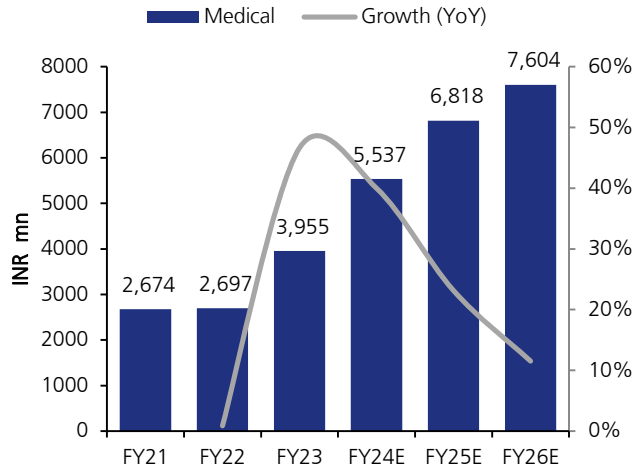
- National Medical Devices Promotion Council promoting the local manufacturing of high-end medical devices
- Growing adoption of minimally invasive surgery techniques and surgical robots

Exhibit 16.Revenue CAGR of 36% likely over FY23-26E



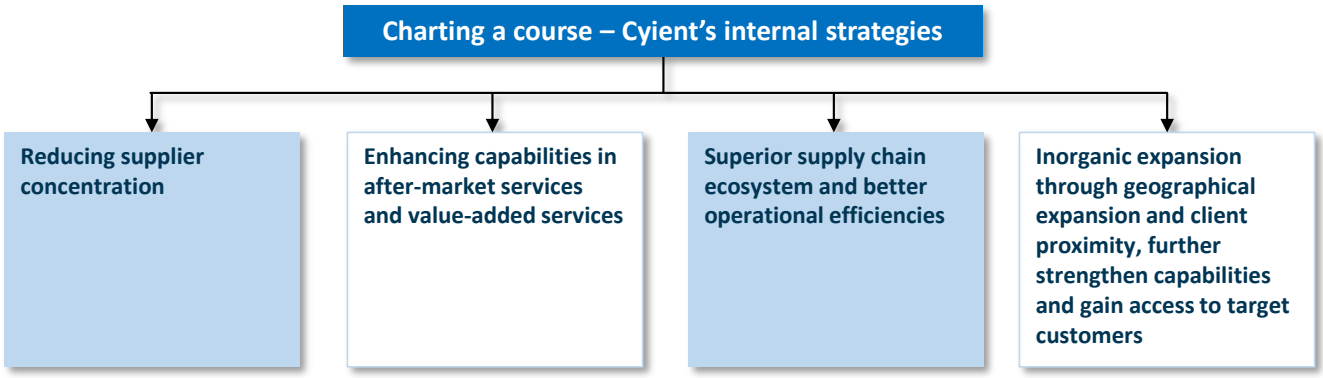
Source: Company, JM Financial

Exhibit 17.Order book CAGR of 24% over FY23-26E



Source: Company, JM Financial

Exhibit 18.CYIENT; Internal Strategy

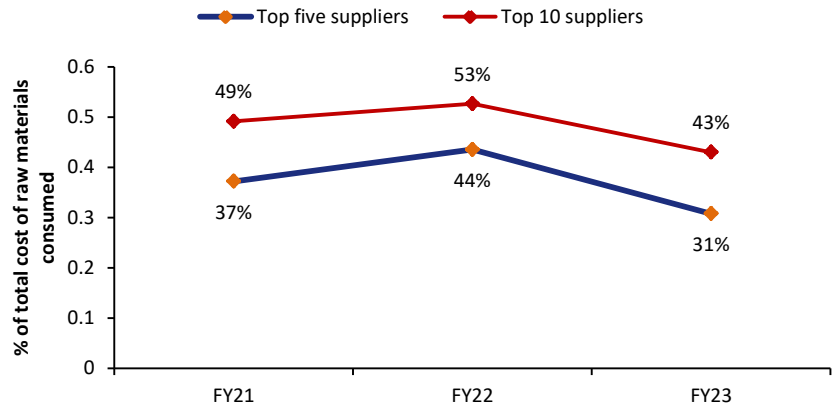


Source: Company, JM Financial

Reducing supplier concentration

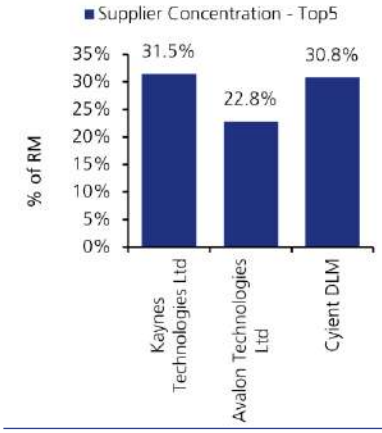
- For Cyient, raw materials constitute c.80% of total expenses in FY23 and thus any delay/disruption due to obligations not fulfilled by suppliers will affect its clientele. To overcome this, Cyient has multiple vendors for each component and does not rely on single sources for each part.
- In fact, it sources raw materials from as many as 776 active third-party suppliers, including overseas suppliers from United States of America, Europe, Israel, China, and Singapore and other Asian countries – which constitute 63% of its total vendors.

Exhibit 19.Supplier concentration has reduced to 43% in FY23 from 49% in FY21



Source: Company, JM Financial

Peer comparison: Top 5 supplier concentration



Source: Company, JM Financial

Enhancing capabilities in after-market services and value-added services

- Higher focus on after-market services and increase in value addition will result in higher customer stickiness. Such efforts include providing repairs and maintenance services as well as value addition through reverse engineering, value engineering and design upgrades.
- Cyient also plans to enhance its offerings in cable harness, precision mechanics and additive manufacturing and will also explore opportunities in OSAT (outsourced semiconductor assembly and test) services.
- It believes such diversification and augmentation will help in enhancing margins and increase brand visibility.

Superior supply chain ecosystem and better operational efficiencies

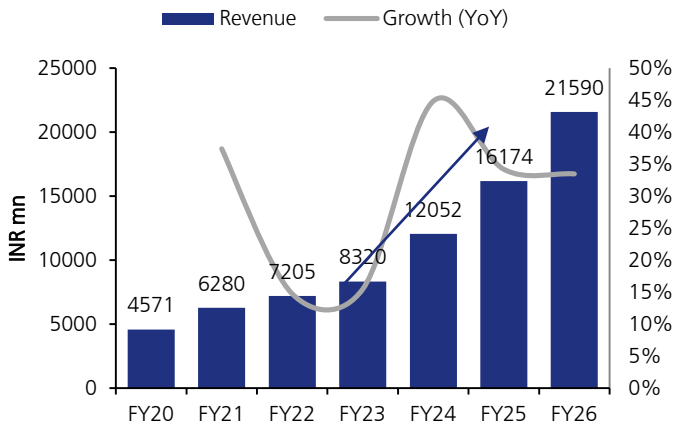
- Cyient intends to better its operational efficiency through increased adoption of automation and better client management.
- It will also look at strengthening customer relationships.
- High focus on digitisation and automation will increase its operational efficiency and provide more flexibility to its customers.
- Optimising supply chain ecosystem results in lower logistics cost & lower time to market.

Inorganic expansion through geographical expansion and client proximity, further strengthen capabilities and gain access to target customers

- Cyient intends to enhance its presence in North America to build greater proximity to a few key clients, which will help in strengthening existing relationships and let the company take part in more strategic projects in the segments it operates in.
- It aims to fortify existing capabilities in high-margin low-volume solutions in safety-critical electronics for A&D, medical and industrial including in PCBAs, cable harnesses, box builds sub-system assembly, testing services and re-engineering and aftermarket services – this will augment revenue, enhance margins, and improve cost controls thus increasing profitability.

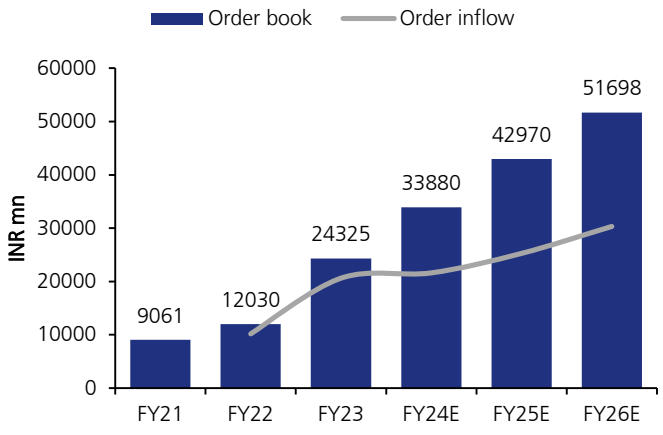
Financial story in charts

Exhibit 20.Revenue CAGR of 37% over FY23-26E because of increasing contribution from A&D and industrials



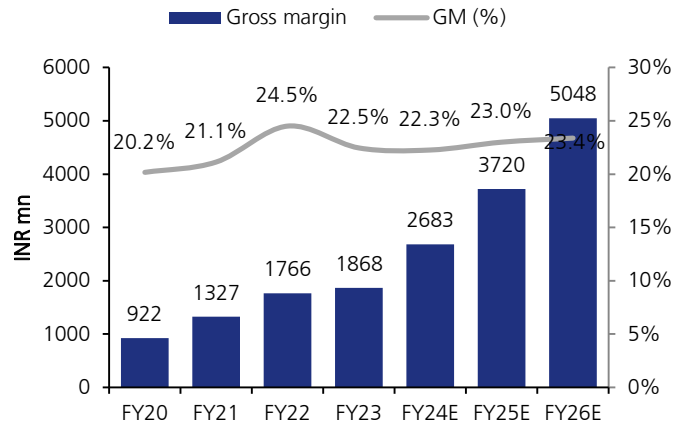
Source: Company, JM Financial

Exhibit 21.It has an industry leading order book; CAGR of 29% over the next 2 years



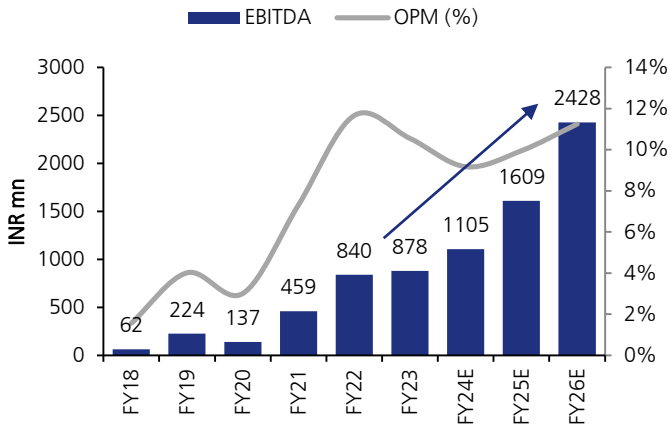
Source: Company, JM Financial

Exhibit 22.Gross margin could improve by 70/40bps in FY25/26 due to better revenue mix



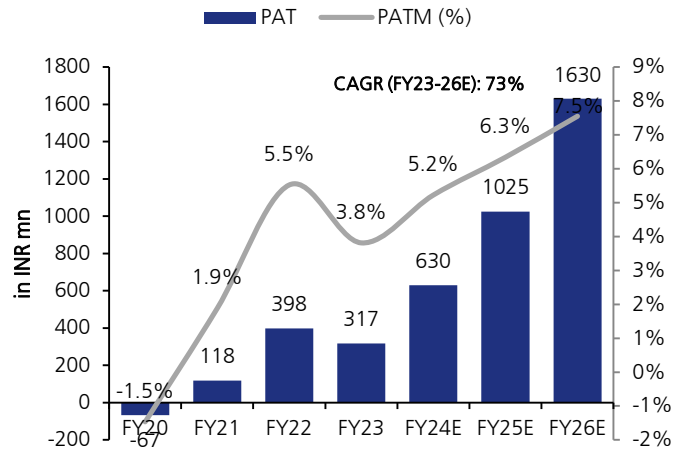
Source: Company, JM Financial

Exhibit 23.EBITDA CAGR of 40% over FY23-26E; margin to expand by 70 bps due to revenue mix



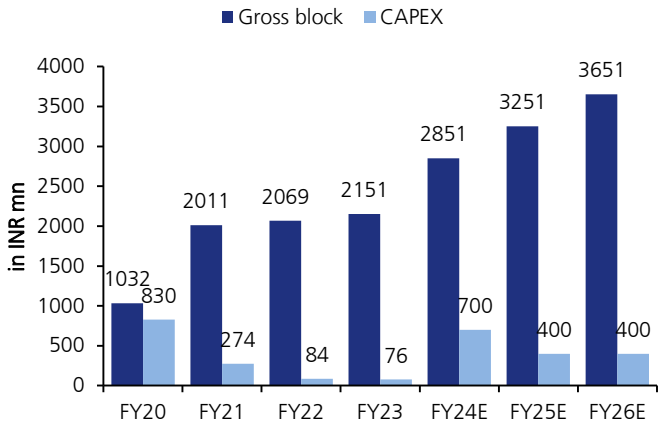
Source: Company, JM Financial

Exhibit 24. Significant improvement in profitability by increasing share of high-margin segments and taking on more B2S



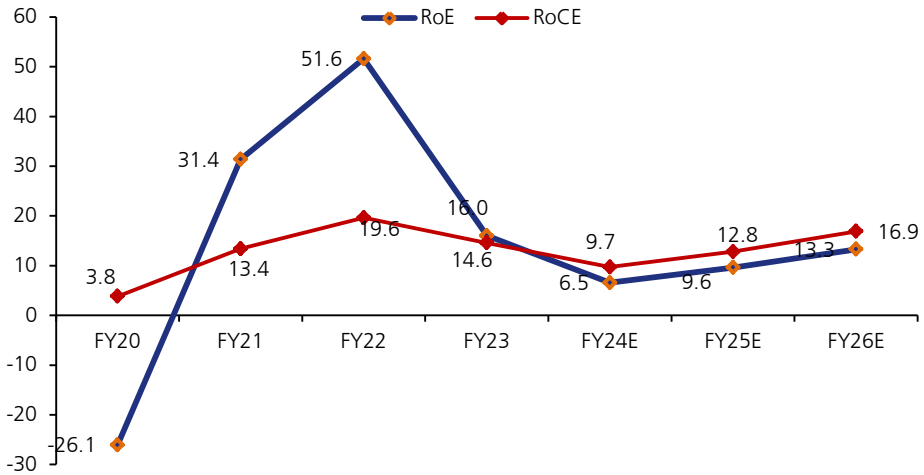
Source: Company, JM Financial

Exhibit 25.Cyient has sufficient capacity to meet growing order book; capex will be majorly for backward integration and strategic acquisitions



Source: Company, JM Financial

Exhibit 26.RoE and RoCE profile to improve



Source: Company, JM Financial

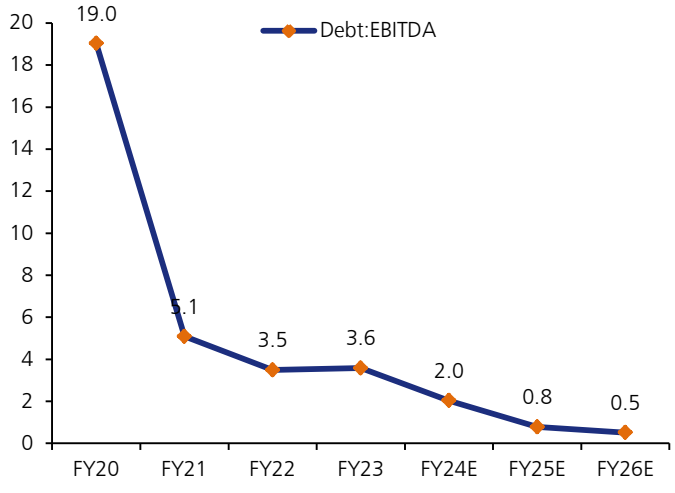
Exhibit 27.DuPont analysis

Du Pont analysis	FY20	FY21	FY22	FY23	FY24E	FY25E	FY26E
Net profit margin (%)	(1.5)	1.9	5.5	3.8	5.2	6.3	7.5
Asset turnover (x)	1.6	2.3	1.9	1.6	1.0	1.4	1.6
Leverage multiplier (x)	8.2	7.1	4.8	2.6	1.2	1.1	1.1
RoE (%)	(19.0)	31.1	51.1	16.0	6.5	9.6	13.3

Source: Company, JM Financial

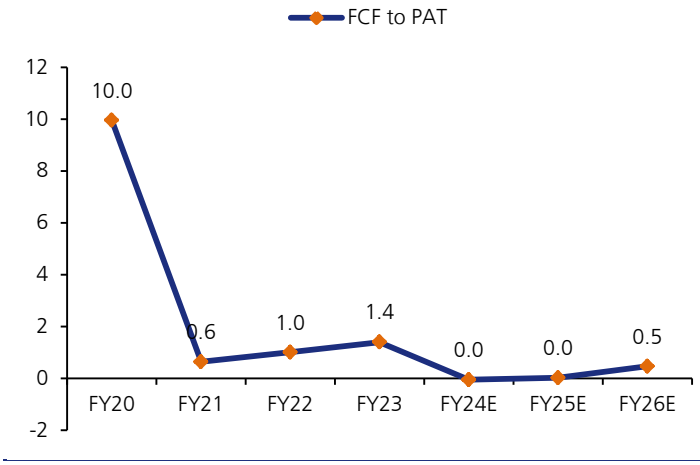
We expect RoE to expand to normal levels over 2 years due to margin expansion and higher revenue growth.

Exhibit 28.Debt:EBITDA will see strong improvement as Cyient plans to repay INR 1,609.11mn from IPO proceeds



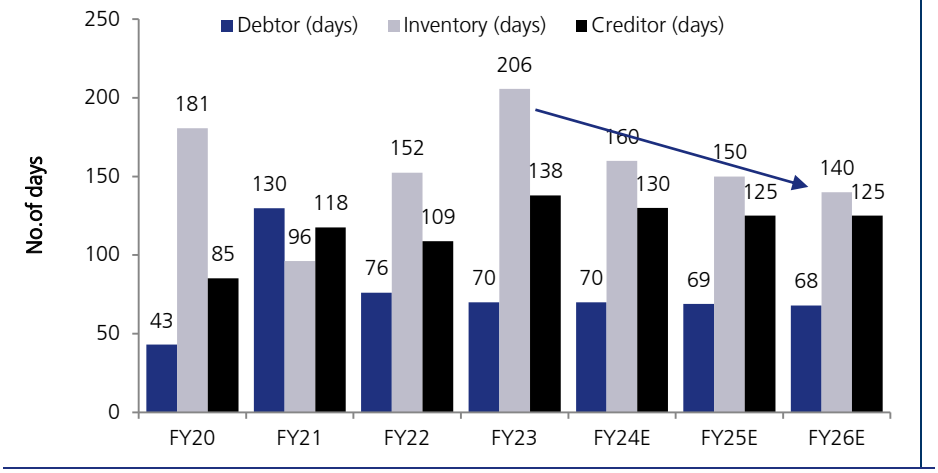
Source: Company, JM Financial

Exhibit 29. FCF generation to rise over next 2-3 years due to strong growth, ease of working capital and operating leverage



Source Company, JM Financial

Exhibit 30.Cyient has very high working capital at present, which should see some reduction ahead, once the component ecosystem develops and supply-chain normalises



Source: Company, JM Financial

Outlook and valuation:

Over the next 2-3 years, Cyient DLM will see strong revenue growth led by:

- Strong order book of c.INR 24bn, which is 3x FY23,
- Customer stickiness will provide higher revenue visibility
- Current capacities, which can cater to most of its order book,
- Its expanding value-added segment, plus move towards OSAT, which will add to margins and revenue,
- Higher A&D portfolio making it an expert player in the industry,
- Increasing customer concentration, which means high focus on value-added customers, and
- Strong industry tailwinds.

All these factors will lead to Revenue/EBITDA/PAT CAGR of 37%/40%/73% over FY23-26E with OPM of 9.9%/11.2% in FY25/26 and YoY earnings growth of 63%/59%. Based on this, robust order book, high earning CAGR, and improved working capital, we value Cyient DLM at 45x on FY26 EPS. We initiate coverage with a BUY rating and a target price of INR 925.

Company overview

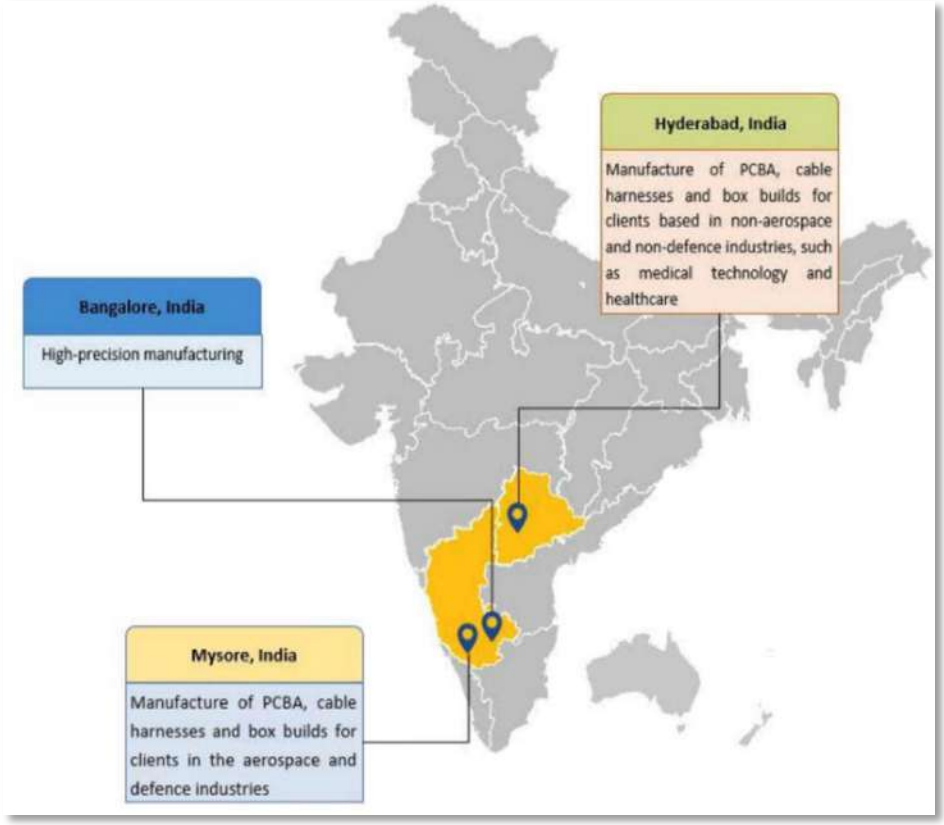
Company background and operations

- Originally incorporated as 'Rangsons Electronics Private Limited' in 1993 at Mysuru, Karnataka, for manufacturing all kinds of electronic assemblies and providing related services.
- Post-acquisition of 74% equity share capital by Cyient Limited, it changed its name to 'Cyient DLM Private Limited' in 2016. In 2019, Cyient Limited acquired the remaining 26% equity share capital.
- Cyient DLM's business model starts from product concept design and focuses on developing high-mix, low-to-medium-volume complex systems. It is one of the few EMS companies in India catering to highly regulated industries
- It operates in aerospace, defence, medical and industrial. It believes in developing longstanding relationships with its clients as the average period of relationships with top customers is 11 years.

Manufacturing facilities

- Cyient DLM's manufacturing set up is spread across three cities namely Mysuru, Hyderabad, and Bengaluru.
- At its Mysuru facility, it undertakes PCBA, cable harnesses, and box-builds for aerospace and defence, which make up the maximum share of revenue.
- The Hyderabad facility, which is in an SEZ, undertakes PCBA, cable harnesses and box-builds operations for non-aerospace and defence industries.
- At its Bengaluru facility, the company manufactures high-precision components.

Exhibit 31.Manufacturing locations



Source: Company, JM Financial

Industry recognition, growth prospects

- It is growing through consolidation and partnerships.
- Received accreditation from NADCAP for "Electronics - Cable and Harness Assemblies" and "Electronics Printed Board Assemblies".

Portfolio, segments:

- Mostly all the products in industrial, medical, aerospace and defence segments are high-margin low-volume products.

Key strengths

- Has manufacturing infrastructure, stringent quality, diverse in-house capabilities and robust supply chain to provide high quality end-to end integrated solutions to its clients.
- Parentage of promoter, Cyient Limited, and a long history of industry expertise.
- Ability to provide integrated engineering solutions with capabilities across the product value chain.
- Longstanding relationships with customers – an opportunity for increased wallet share.

B2S led by promoter

Cyient DLM is focused on providing B2S to its clients. It involves the promoter's design team, which designs basis requirements and specifications of the client. Cyient DLM provides inputs in terms of 'design for manufacturability' and 'design for testing'. This is a high-margin business and it is focused on setting up its own design competency to increase its current mix of B2S.

Exhibit 32.Cyient DLM is an integrated EMS provider with a wide range of services

Service-wise revenues (in INR mn)	FY21	FY22	FY23
PCBA	3800	4565	5210
as a % of sales	60.5%	63.3%	62.6%
Cable Harness	39	64	114
as a % of sales	0.6%	0.9%	1.4%
Box builds	2291	2410	2697
as a % of sales	36.5%	33.4%	32.4%
Others	150	167	300
as a % of sales	2.4%	2.3%	3.6%
Total	**6281**	**7206**	**8321**

Source: Company, JM Financial

Value added and after-market services

- **Obsolescence management:** It advises on any components that need to be replaced due to technology upgradation and non-availability of the relevant component.
- **New product introduction:** It involves taking a product idea from the conceptualisation stage to making the product available for use or production.
- **Value engineering:** Can be defined as an organised effort directed at analysing designed building features, systems, equipment, and material selection.
- **Localisation:** Process of adapting a particular product to the local needs of a particular geography or culture with a focus on leveraging locally available components to build the product.

  Logistics and supply-chain management: Helps clients manage their supply chain requirements from sourcing to logistics to storage solutions.

Experienced/diversified board will drive successes

Exhibit 33.Strong team with prominent independent directors

Name	Designation	Joining Date to Board
Ganesh Venkat Krishna Bodanapu	Chairman, Non- Executive & Non-Independent Director	February 4, 2015
Rajendra Velagapudi	Managing Director	April 25, 2017
Shrinivas Kulkarni	Chief Financial officer	January 02, 2023
Anthony Montalbano	Chief Executive Officer	January 02, 2023
Venkat Rama Mohan Reddy Bodanapu	Non-Executive, Non–Independent Director	December 27, 2022.
Vanitha Datla	Independent Director	December 13, 2022
Jehangir Ardeshir	Independent Director	December 13, 2022
Pillutla Madan Mohan	Independent Director	December 27, 2022
Ms.Suchitra R C	Additional Director & Vice President Operations	October 10, 2022

Source: Cyient DLM RHP, JM Financial

Exhibit 34.Key managerial personnel – background, industry experience

Name	Designation	Education	Experience
Ganesh Venkat Krishna Bodanapu	Chairman, Non-Executive & Non-Independent Director	• Bachelor's degree of science in electrical engineering from Purdue University and • Master's degree in business administration from the J.L Kellogg School of Management.	Associated with Cyient DLM's promoter since 2003.
Rajendra Velagapudi	Managing Director	• Bachelor's degree in technology (Mechanical), • Master's degree in automobile engineering and degree of master of science in design of rotating mechanics	Previously associated with: • Simpsons Co. Ltd. for two years • Bajaj Tempo Limited • Bharat Earth Movers for over 8 years
Shrinivas Kulkarni	Chief Financial officer	• Bachelor's degree in science from Karnataka University, Dharwad and • Associate member of Institute of Cost Accountants of India	Previously associated with: • Ind- Telesoft Private Limited, • Intel Corporation, • Intel India Private Limited, • EMC Software and Service India Private Limited and • Sasken Communication Technologies Ltd.
Anthony Montalbano	Chief Executive Officer	• Bachelor's degree of arts from Western Washington University and • Master's degree of business administration from UCLA.	Previously, he as associated with: • Flex, USA for a period of 10 years, • HCL America Inc. and • Wipro Limited
Venkat Rama Mohan Reddy	Non-Executive, Non–Independent Director	• Bachelor's degree in engineering from Faculty of Engineering, Andhra University • Master's degree of technology from Indian Institute of Technology, Kanpur.	He has been associated with: • HCL Limited and • Electronic Industries Association of Andhra Pradesh.

Source: Cyient DLM RHP, JM Financial

Financial Tables (Consolidated)

Income Statement (INR mn)

Y/E March	FY22A	FY23A	FY24E	FY25E	FY26E
Net Sales	7,205	8,320	12,052	16,174	21,590
Sales Growth	14.7%	15.5%	44.9%	34.2%	33.5%
Other Operating Income	0	0	0	0	0
Total Revenue	**7,205**	**8,320**	**12,052**	**16,174**	**21,590**
Cost of Goods Sold/Op. Exp	5,440	6,452	9,369	12,455	16,542
Personnel Cost	517	647	1,126	1,463	1,756
Other Expenses	409	343	452	647	864
EBITDA	**840**	**878**	**1,105**	**1,609**	**2,428**
EBITDA Margin	11.7%	10.5%	9.2%	9.9%	11.2%
EBITDA Growth	82.9%	4.4%	25.9%	45.6%	50.9%
Depn. & Amort.	193	194	225	285	293
EBIT	648	684	880	1,324	2,135
Other Income	80	63	272	200	150
Finance Cost	220	315	313	157	112
PBT before Excep. & Forex	507	432	840	1,367	2,173
Excep. & Forex Inc./Loss(-)	0	0	0	0	0
PBT	507	432	840	1,367	2,173
Taxes	109	114	210	342	543
Extraordinary Inc./Loss(-)	0	0	0	0	0
Assoc. Profit/Min. Int.(-)	0	0	0	0	0
Reported Net Profit	398	317	630	1,025	1,630
Adjusted Net Profit	**398**	**317**	**630**	**1,025**	**1,630**
Net Margin	5.5%	3.8%	5.2%	6.3%	7.5%
Diluted Share Cap. (mn)	1.4	52.9	79.3	79.3	79.3
Diluted EPS (INR)	**7.5**	**6.0**	**7.9**	**12.9**	**20.6**
Diluted EPS Growth	237%	-20%	32%	63%	59%
Total Dividend + Tax	0	0	0	0	0
Dividend Per Share (INR)	0.0	0.0	0.0	0.0	0.0

Source: Company, JM Financial

Balance Sheet (INR mn)

Y/E March	FY22A	FY23A	FY24E	FY25E	FY26E
Shareholders' Fund	771	1,979	9,618	10,643	12,273
Share Capital	14	529	793	793	793
Reserves & Surplus	757	1,450	8,824	9,850	11,480
Preference Share Capital	0	0	0	0	0
Minority Interest	0	0	0	0	0
Total Loans	2,932	3,145	2,245	1,245	1,245
Def. Tax Liab. / Assets (-)	0	0	0	0	0
Total - Equity & Liab.	**3,703**	**5,123**	**11,862**	**11,888**	**13,518**
Net Fixed Assets	1,756	1,623	2,098	2,213	2,320
Gross Fixed Assets	2,069	2,151	2,851	3,251	3,651
Intangible Assets	30	30	30	30	30
Less: Depn. & Amort.	377	572	797	1,082	1,374
Capital WIP	34	13	13	13	13
Investments	3	895	1,245	1,495	1,595
Current Assets	6,010	8,529	15,943	16,867	20,170
Inventories	2,696	4,251	5,283	6,647	8,281
Sundry Debtors	1,523	1,617	2,311	3,058	4,022
Cash & Bank Balances	1,218	1,676	7,363	6,177	6,882
Loans & Advances	0	0	0	0	0
Other Current Assets	573	985	985	985	985
Current Liab. & Prov.	4,066	5,924	7,423	8,687	10,568
Current Liabilities	1,925	2,853	4,352	5,616	7,496
Provisions & Others	2,141	3,071	3,071	3,071	3,071
Net Current Assets	1,944	2,605	8,519	8,180	9,602
Total – Assets	**3,703**	**5,123**	**11,862**	**11,888**	**13,518**

Source: Company, JM Financial

Cash Flow Statement (INR mn)

Y/E March	FY22A	FY23A	FY24E	FY25E	FY26E
Profit before Tax	398	317	840	1,367	2,173
Depn. & Amort.	193	194	225	285	293
Net Interest Exp. / Inc. (-)	175	267	41	-43	-38
Inc (-) / Dec in WCap.	-329	-229	-227	-846	-718
Others	111	140	0	0	0
Taxes Paid	-62	-168	-210	-342	-543
Operating Cash Flow	**485**	**521**	**669**	**421**	**1,166**
Capex	-84	-76	-700	-400	-400
Free Cash Flow	401	445	-31	21	766
Inc (-) / Dec in Investments	-240	-1,342	-78	-50	50
Others	0	0	0	0	0
Investing Cash Flow	**-324**	**-1,418**	**-778**	**-450**	**-350**
Inc / Dec (-) in Capital	0	889	264	0	0
Dividend + Tax thereon	0	0	0	0	0
Inc / Dec (-) in Loans	591	57	-900	-1,000	0
Others	-130	-205	6,432	-157	-112
Financing Cash Flow	**461**	**740**	**5,796**	**-1,157**	**-112**
Inc / Dec (-) in Cash	**622**	**-157**	**5,687**	**-1,186**	**704**
Opening Cash Balance	147	930	1,676	7,363	6,177
Closing Cash Balance	769	773	7,363	6,177	6,882

Source: Company, JM Financial

Dupont Analysis

Y/E March	FY22A	FY23A	FY24E	FY25E	FY26E
Net Margin	5.5%	3.8%	5.2%	6.3%	7.5%
Asset Turnover (x)	2.2	1.9	1.4	1.4	1.7
Leverage Factor (x)	5.6	3.2	1.5	1.2	1.1
RoE	69.4%	23.1%	10.9%	10.1%	14.2%

Key Ratios

Y/E March	FY22A	FY23A	FY24E	FY25E	FY26E
BV/Share (INR)	564.1	37.4	121.3	134.2	154.7
ROIC	20.9%	20.0%	22.7%	26.6%	34.6%
ROE	69.4	23.1	10.9	10.1	14.2
Net Debt/Equity (x)	2.2	0.7	-0.5	-0.5	-0.5
P/E (x)	111.5	139.9	105.7	64.9	40.8
P/B (x)	1.5	22.4	6.9	6.3	5.4
EV/EBITDA (x)	80.9	77.2	55.3	38.1	25.0
EV/Sales (x)	9.4	8.1	5.1	3.8	2.8
Debtor days	77	71	70	69	68
Inventory days	137	186	160	150	140
Creditor days	110	140	145	141	143

Source: Company, JM Financial

Avalon Technologies Ltd | BUY

Fueling growth at home; USA export ready to soar

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Avalon is a fully integrated leading EMS player in India with having its manufacturing arm both in India and US. Its capabilities range from PCB design and assembly to manufacturing of complete electronic systems, and it caters to diverse industries from industrials to digital infrastructure. Company has strong relationship with client with average relationship of 8 years, additionally it has strong box-build capability which adds to the margins, however in FY24, slowdown in US business +negative operating leverage impacted operating margin. Company is now increasing share in domestic market in segment like railways, industrial etc. It has an order book of INR 12.7bn as of 9MFY24 (INR 12.3bn in FY23), which is executable in 12-15 months. We expect with increasing domestic share and pickup in US market + cost control will lead to improvement in margin.

- **Strong customer base across industry segments:** Over the last few years Avalon has added c.41 customers, taking the total number of customers to 95 in FY23. Company has a relationship of 8 years with customers who contribute to 80% of revenue. Long product life + higher mix =Customer stickiness + higher margin. Also, with addition of new customers, the company has significantly reduced its concentration in Top 5 and Top 10 customers, leading to low customer dependency.
- **Vertical integration to offer end-to-end solutions with highest share of Box-Build in peers:** Avalon is a one-stop solution provider (Design to Box-Build). The share of Box build in FY23 was c.54% (51% in FY24E due to slowdown in business) vs. 44% in FY20, a CAGR of 22% over FY20-23, highest amongst all its business segments. Avalon has the highest share of Box build leading to high gross margin (however OPM impacted due to business slowdown in FY24). Currently, c.80% of the manufacturing takes place in India and the management has further guided to shift more production to India, which will decrease the overheads cost and in turn, add to margins.
- **Higher customer stickiness:** Avalon mostly undertakes high-margin flexible-volume manufacturing of products with a long product lifecycle, which requires a lot of collaboration and technology transfer with its clients. The product approval process, right from initial design, prototyping, to OEM approval and mass production is complex and long, which ensures customer stickiness. Given the depth and nature of its engagement with longstanding customers, it is not easy for its clients to switch to another EMS provider, because the cost, time and effort for such transitions are high. The strong customer base also opens doors for cross-selling and up-selling to fuel future growth.
- **We initiate with BUY; with TP of INR 620:** We expect Avalon to see revenue/EBITDA/PAT CAGR of c.36/59%/94% over FY24-26, with gross margin of c.35.9/35.4/35.4% and OPM of 7.0/8.6/9.6% in FY24/25/26. We see strong earnings growth of c.126%/66% in FY25/FY26 respectively, improved RoCE/RoE of c.15%/11% in FY26, and improvement in working capital, based on which we value Avalon at 36x FY26 EPS to arrive at a target price of INR 620 and initiate with BUY rating.

Recommendation and Price Target	
Current Reco.	BUY
Previous Reco.	NA
Current Price Target (12M)	620
Upside/(Downside)	20.9%
Previous Price Target	NA
Change	NA

Key Data – AVALON IN	
Current Market Price	INR513
Market cap (bn)	INR33.7/US$0.4
Free Float	35%
Shares in issue (mn)	58.0
Diluted share (mn)	58.0
3-mon avg daily val (mn)	INR181.7/US$2.2
52-week range	732/347
Sensex/Nifty	73,143/22,213
INR/US$	82.9

Price Performance			
%	1M	6M	12M
Absolute	-2.4	6.6	0.0
Relative*	-5.7	-5.4	0.0

* To the BSE Sensex

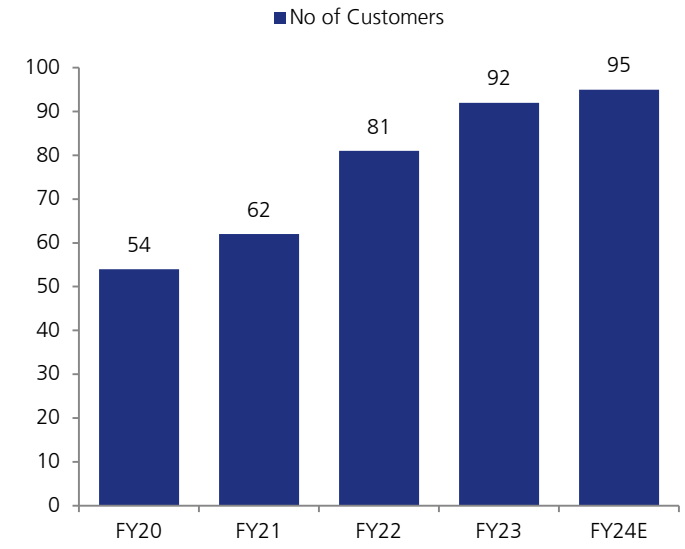
Financial Summary					(INR mn)
Y/E March	FY22A	FY23A	FY24E	FY25E	FY26E
Net Sales	8,407	9,447	8,562	11,474	15,937
Sales Growth (%)	21.8	12.4	-9.4	34.0	38.9
EBITDA	975	1,128	603	982	1,532
EBITDA Margin (%)	11.6	11.9	7.0	8.6	9.6
Adjusted Net Profit	647	525	265	601	997
Diluted EPS (INR)	11.6	9.1	4.6	10.4	17.2
Diluted EPS Growth (%)	192	-22	-49	126	66
ROIC (%)	18.9	17.0	6.8	13.1	18.4
ROE (%)	116.7	16.8	5.2	11.7	16.8
P/E (x)	44.1	56.6	112	49.5	29.8
P/B (x)	34.1	5.5	6.2	5.5	4.6
EV/EBITDA (x)	33.4	25.4	47.5	29.3	18.9
Dividend Yield (%)	0.0	0.0	0.0	0.0	0.0

Source: Company data, JM Financial. Note: Valuations as of 23/Feb/2024

JM Financial Research is also available on:
Bloomberg - JMFR <GO>,
Thomson Publisher & Reuters,
S&P Capital IQ, FactSet and Visible Alpha

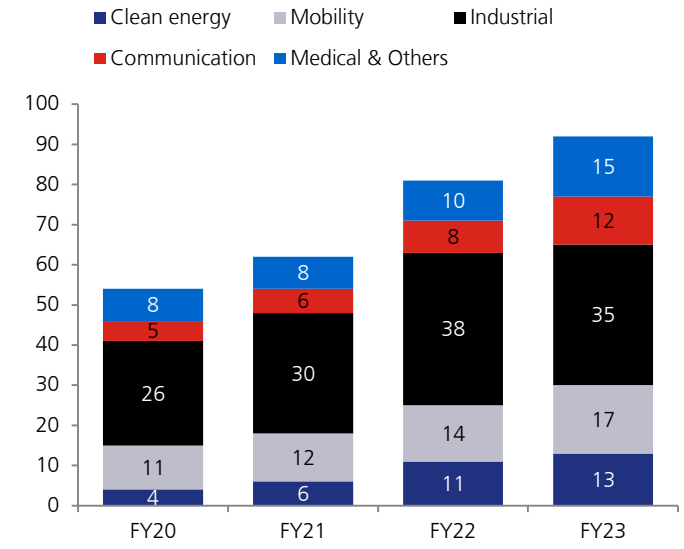
Please see Appendix I at the end of this report for Important Disclosures and Disclaimers and Research Analyst Certification.

Exhibit 1. Continuous Increase in customer base



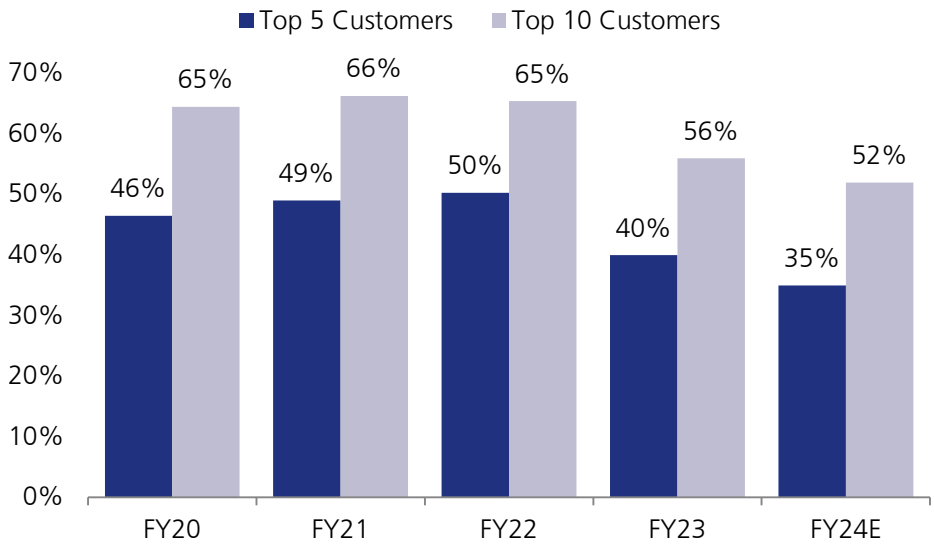
Source: Company, JM Financial

Exhibit 2. Industrial and clean remain major revenue contributor



Source: Company, JM Financial

Exhibit 3. Top 10 customer accounts for c.50% of revenue



Source: Company, JM Financial

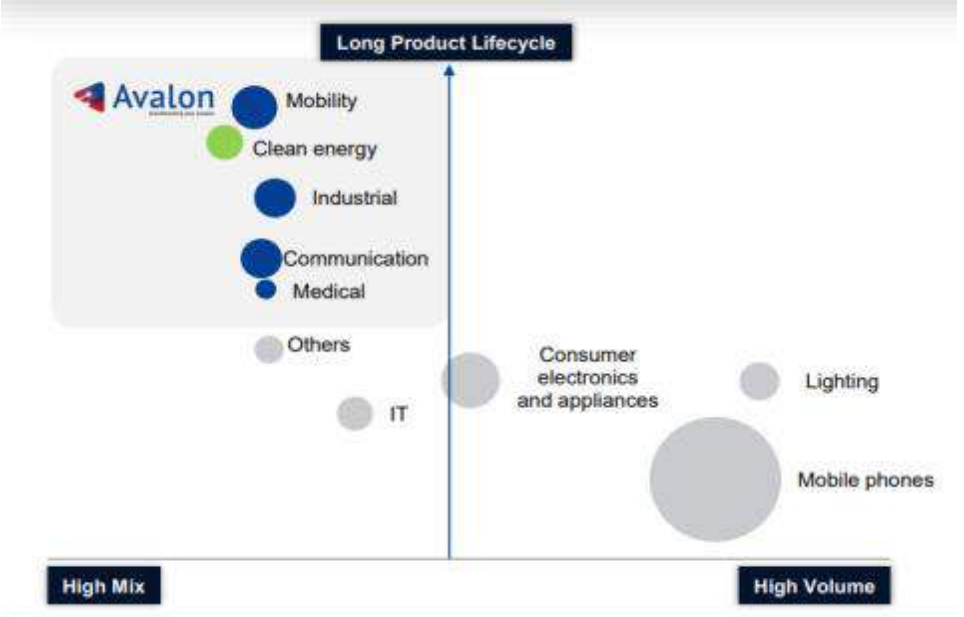
Avalon caters to high-growth industries such as clean energy, mobility, aerospace and defence, railways, industrial, medical, etc. The management is hopeful that it can continue to reduce dependence on any one industry.

Exhibit 4. Avalon has a presence across industry verticals, strong growth momentum to be seen in Mobility + communication going ahead

Industry-wise revenue break-up (inINRmn)	FY19	FY20	FY21	FY22	FY23	FY24E	FY25E	FY26E	CAGR (FY23-26E)
Clean energy	768	1,026	1,234	1,727	2,363	1,693	2,263	3,131	10%
as a % of revenues	11%	16%	18%	20%	25%	20%	19%	20%	
Mobility	1,889	2,012	1,984	2,265	1,985	2,197	2,801	3,884	25%
as a % of revenues	28%	31%	29%	27%	21%	26%	24%	25%	
Industrial	1,790	1,823	2,043	2,558	2,741	2,249	2,972	4,219	15%
as a % of revenues	27%	28%	29%	30%	29%	26%	26%	27%	
Communication	1,388	409	547	611	1,040	1,286	1,945	2,144	27%
as a % of revenues	21%	6%	8%	7%	11%	15%	17%	14%	
Medical	729	527	545	656	595	550	809	1,089	22%
as a % of revenues	11%	8%	8%	8%	6%	6%	7%	7%	
Others	177	733	607	699	633	586	861	1,160	22%
as a % of revenues	3%	11%	9%	8%	7%	7%	7%	7%	
Total	**6,740**	**6,532**	**6,959**	**8,517**	**9,356**	**8,562**	**11,651**	**15,627**	

Source: Company, JM Financial

Exhibit 5. Present in high-mix low-volume segment



Source: Company, JM Financial

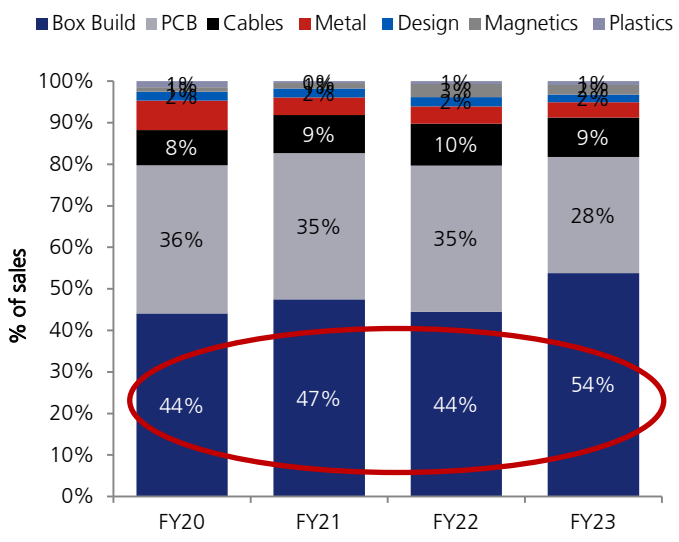
Exhibit 6. High mix and long product development cycle

Source: Company, JM Financial

Vertical integration to offer end-to-end solutions with highest share of Box-build vs peers

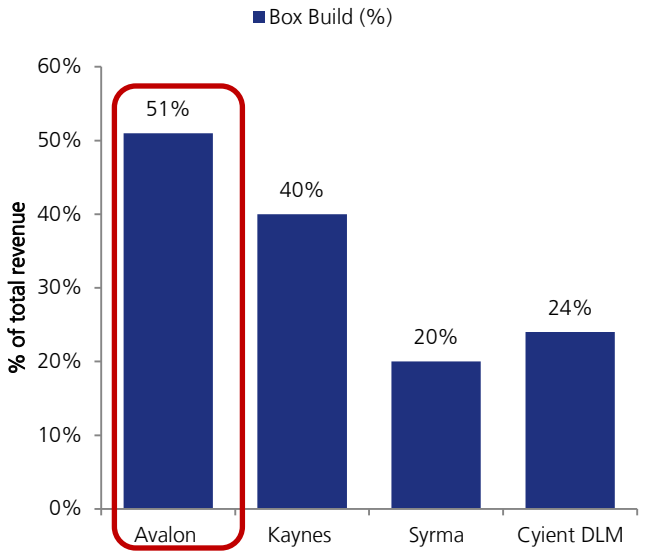
Avalon is an integrated end-to-end solutions provider. It provides various services such as PCB design and assembly, cable assembly, wire harness, sheet metal fabrication, sheet metal machining, plastic injection moulding, magnetics, electro-mechanical integration, which allows it to offer end-to-end Box build solutions. It offers all services right from PCB design and assembly to new product development and subsequent volume production. The share of Box build has grown to 54% in FY23 vs. 44% in FY 20, a CAGR of 22% over FY20-23, the highest among the company's segments. **The management has guided for increase in share of Box builds to overall revenue, which will provide better margins and help the company gain higher wallet share with customers.**

Exhibit 7. Box build share has grown to 54% in FY23 vs. 44% in FY20, leading to a strong margin portfolio



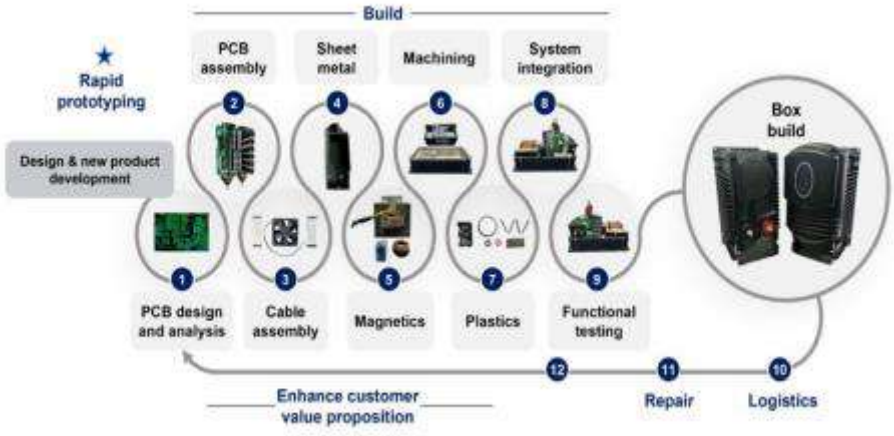
Source: Company, JM Financial

Exhibit 8. Avalon has highest share of Box build amongst peers



Source: Company, JM Financial

Exhibit 9. Present across product lines



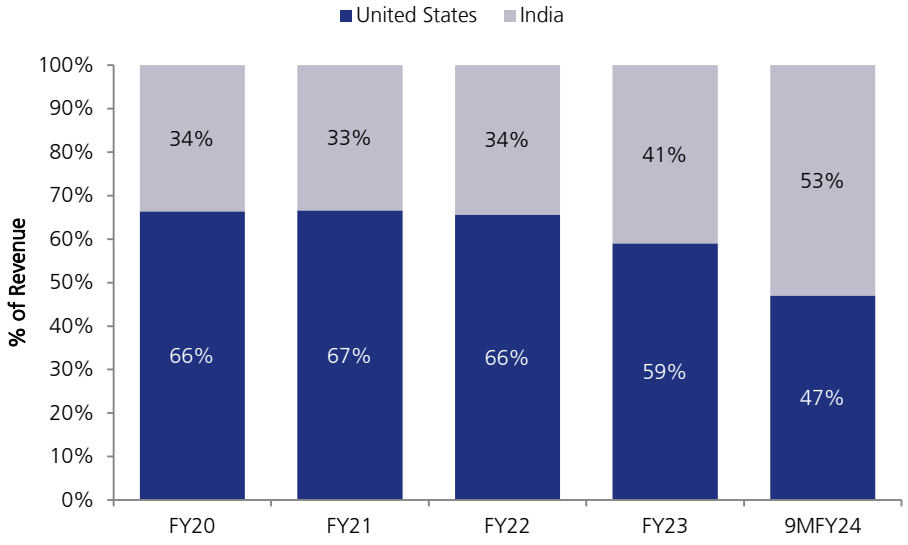
Source: Company, JM Financial

Avalon has developed a global manufacturing footprint via its manufacturing facilities located in India and the US. Through these, it provides localised services to clients in both locations. It makes the most of the manufacturing cost arbitrage that its India facilities bring, and leverages this to gain traction in the global market.

Its Indo-American manufacturing footprint gives customers the leverage to buy directly from India or through its US operations. 80% of its manufacturing takes place in India, but a majority of its products is exported to North America due to the higher customer concentration from that region. Its India manufacturing facilities are located in an SEZ in the port city of Chennai, which helps in availing various incentives such as the ability to import raw material without duties.

Avalon's manufacturing presence in India and the US allows it to provide localised services and cost arbitrage to customers. Its location in an SEZ in Chennai allows it access to duty-free imports of raw materials for finished-product exports

Exhibit 10. Avalon's domestic revenue has grown at CAGR of c.22% vs. US revenue of c.13% over FY20-23

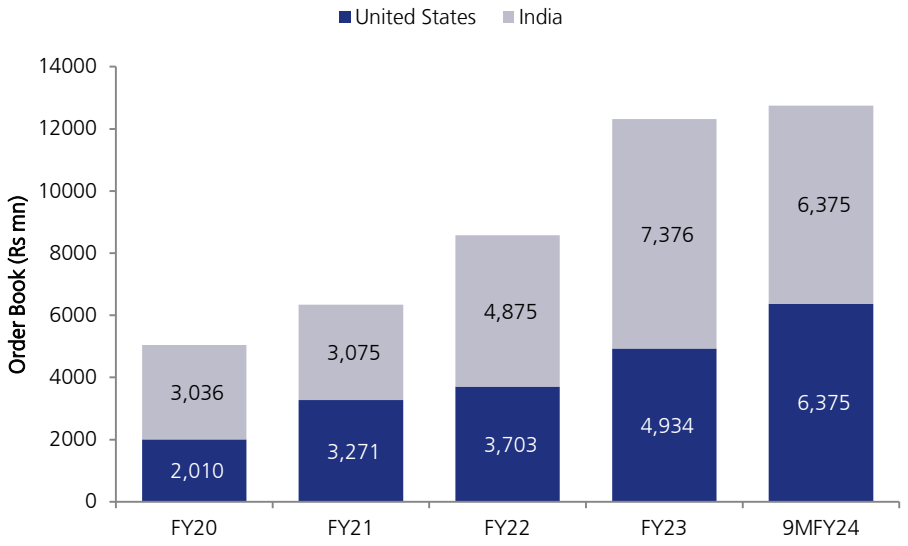


Source: Company, JM Financial

Avalon is well placed to take advantage of 'infrastructure bill' of US, which provides subsidies for manufacturing products in the US.

Its customers can cater to 'Made in USA' initiatives, while at the same time being able to procure products at optimal cost. Avalon also benefits from 'Made in India for the US'.

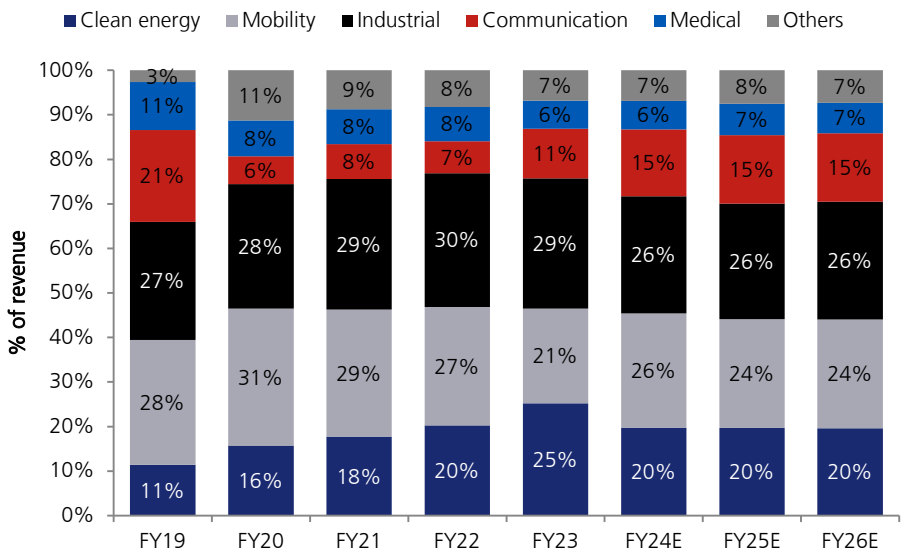
Exhibit 11. Domestic order book has started picking up for Avalon; US order book impacted in FY24 due to slowdown in the economy



Source: Company, JM Financial

Diversifying the focus from clean energy to other segments

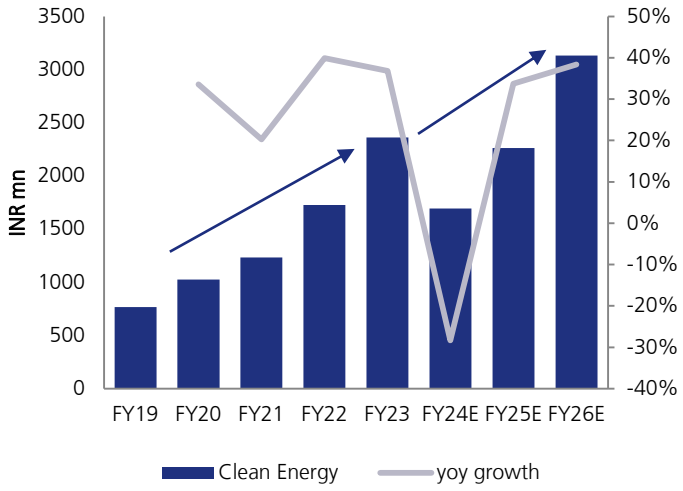
Exhibit 12. Avalon to diversify in order to avoid downturn in any particular industry



Clean energy revenue to grow at a CAGR of 35% YoY over FY24-26 majorly driven by EV, Renewables and strong export opportunity in North America for green hydrogen.

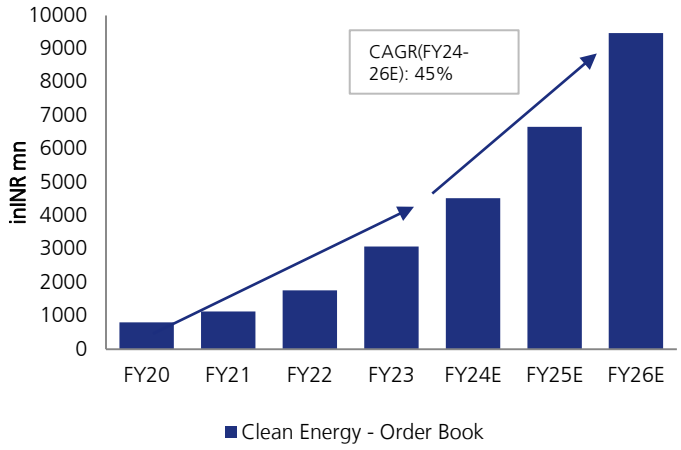
Source: Company, JM Financial

Exhibit 13. Clean energy segment impacted in FY24 due to US slowdown, major customers to re-start by 2HFY25



Source: Company, JM Financial

Exhibit 14. This segment has strong order on back of EV, leading a CAGR of c.45% over FY24-26



Source: Company, JM Financial

Exhibit 15. Solar energy products basket

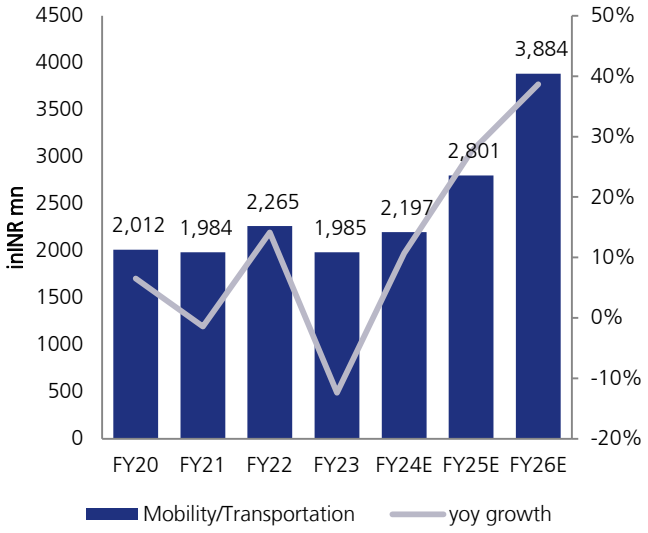
Source: Company, JM Financial

Exhibit 16. Hydrogen-related products basket

Source: Company, JM Financial

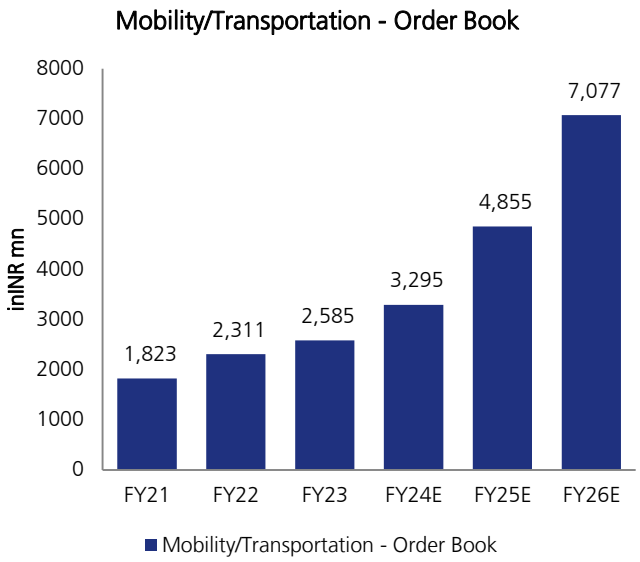
Mobility & Transport segment to grow at a CAGR of c.33% over FY24-26 on the back of (1) Strong capex from the railways + A&D and (2) Shift of India's automotive industry towards electronic systems as its import-heavy market is slowly developing a local manufacturing ecosystem.

Exhibit 17. Mobility/Transportation segment to grow at a CAGR of c.33% over FY24-26 mainly driven by Railways



Source: Company Data, JM Financial

Exhibit 18. Mobility segment to see strong traction in order book



Source: Company Data, JM Financial

Exhibit 19. Automotive products

Source: Company Data, JM Financial

Exhibit 20. Railway products

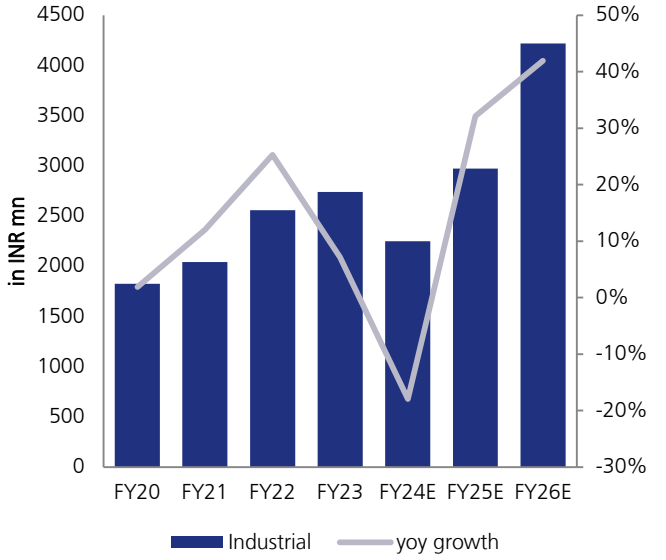
Source: Company Data, JM Financial

Exhibit 21. Aerospace products manufactured by Avalon

Source: Company Data, JM Financial

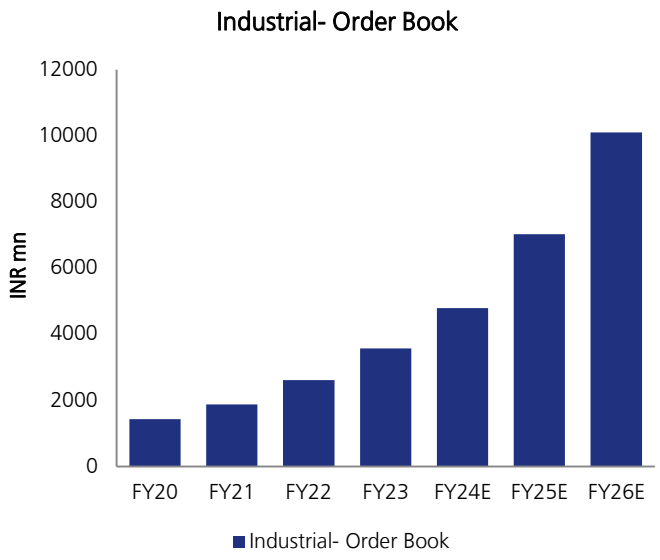
Industrial segment to see revenue CAGR of c.37% over FY24-26 on the back of strong public and private capex and increase in power capex.

Exhibit 22. Industrial segment to see CAGR of c.37% over FY24-26



Source: Company Data, JM Financial

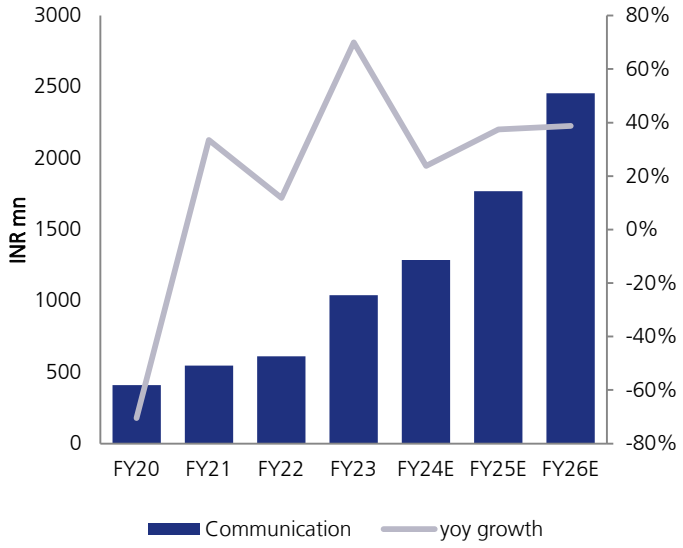
Exhibit 23. Order book to grow at a CAGR of c.45% over FY24-26



Source: Company Data, JM Financial

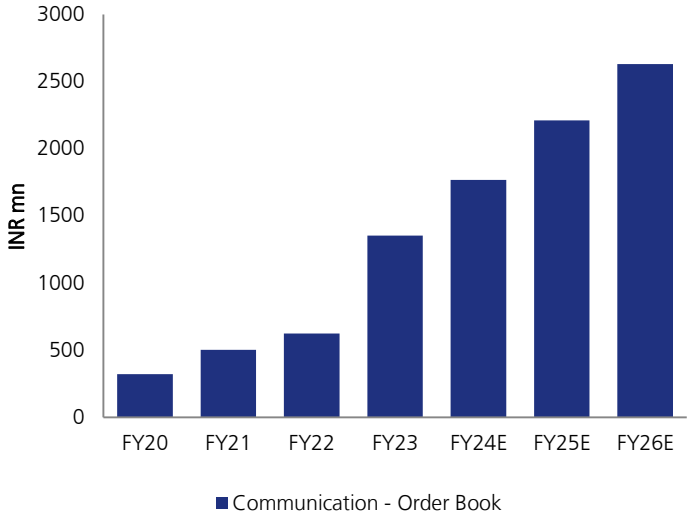
Communication segment to see revenue CAGR of c.38% over FY24-26 due to increase in mobile-phone penetration and reduction in data prices, which will add 500mn additional internet users in India and benefit sectors such as telecom equipment, 5G, satellite, and digital infrastructure.

Exhibit 24. Segment to see CAGR of c.38% over FY24-26



Source: Company, JM Financial

Exhibit 25. Strong order backlog in communication



Source: Company, JM Financial

Exhibit 26. 5G products

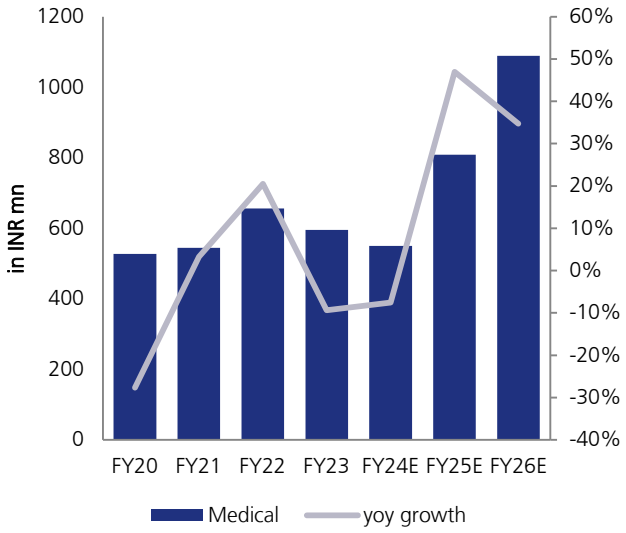
Source: Company, JM Financial

Exhibit 27. Products related to digital infrastructure

Source: Company, JM Financial

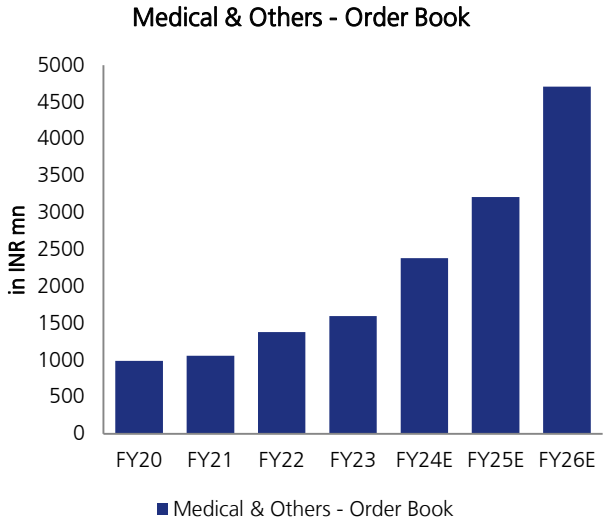
Medical to see a revenue CAGR of 41% over FY24 to FY26 due to strong order book, increasing share from existing client and adding new customer

Exhibit 28. Medical to see revenue CAGR of c.41% over 24-26



Source: Company, JM Financial

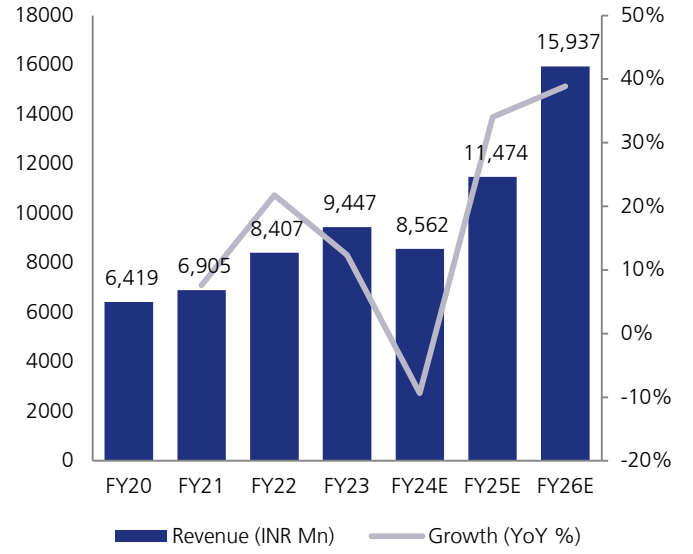
Exhibit 29. Growth driven by strong order visibility in the segment



Source: Company, JM Financial

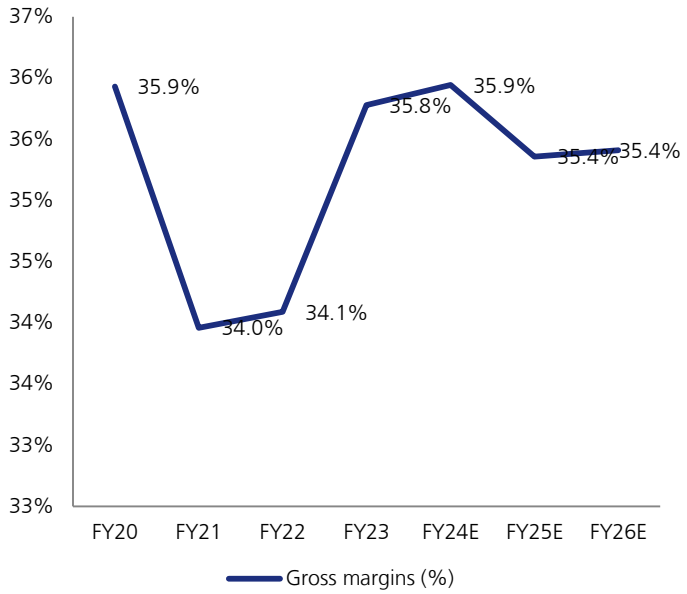
Financial Story in Charts

Exhibit 30. Slowdown in US dragged overall performance in FY24; however, Avalon will see a revenue CAGR of c.36% over FY24-26E backed by strong growth across in Mobility, Clean energy & industrial



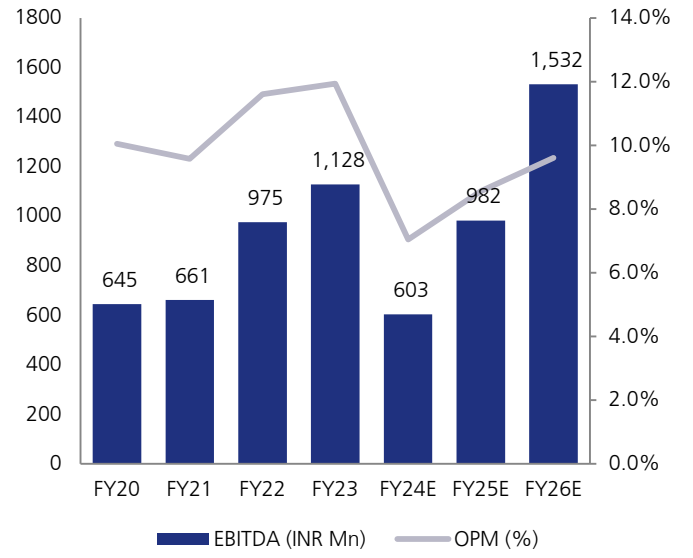
Source: Company, JM Financial

Exhibit 31. Gross margin profile conservative, but will improve with increasing share of Box build



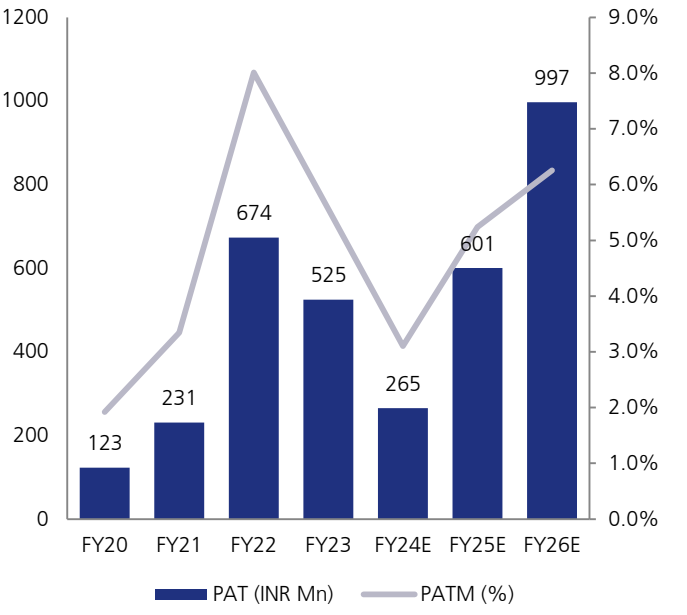
Source: Company, JM Financial

Exhibit 32. FY24 OPM dragged by negative operating leverage, likely to normalise over the next 2 years mainly because of operating leverage and cost controls



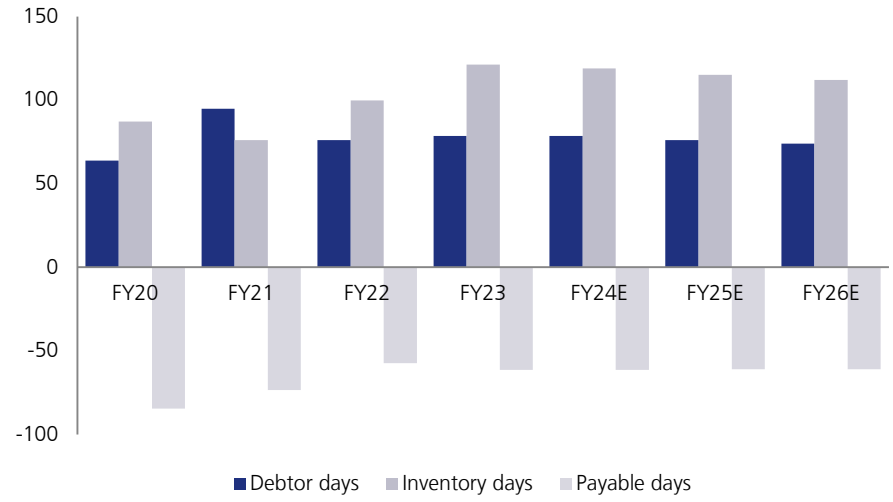
Source: Company, JM Financial

Exhibit 33. Avalon to see highest-ever PAT in FY26E



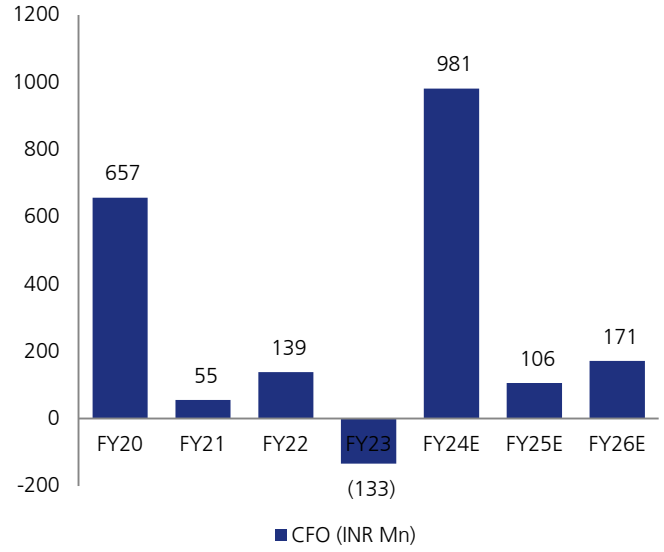
Source: Company, JM Financial

Exhibit 34. Conservative working capital break-up; Presently high WC days due to headwinds (inflation, inventory correction) in US markets; however, management expects working capital days to decrease over FY24E-26 due to easing of supply chain



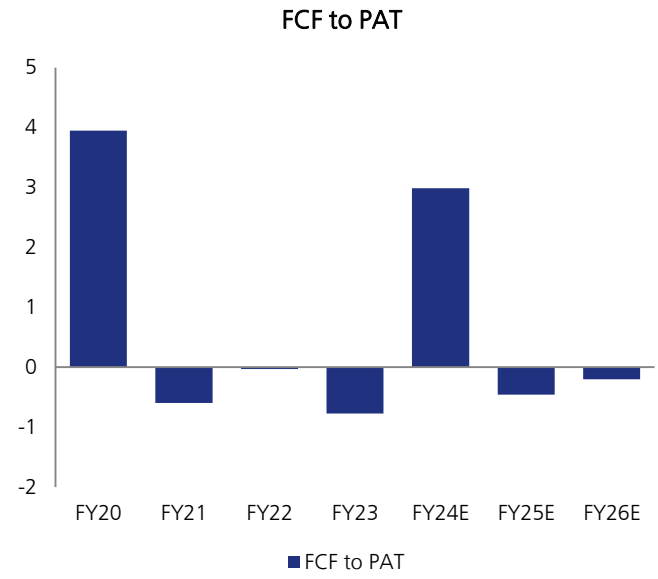
Source: Company, JM Financial

Exhibit 35. Avalon will generate strong CFO, which will support capex requirements



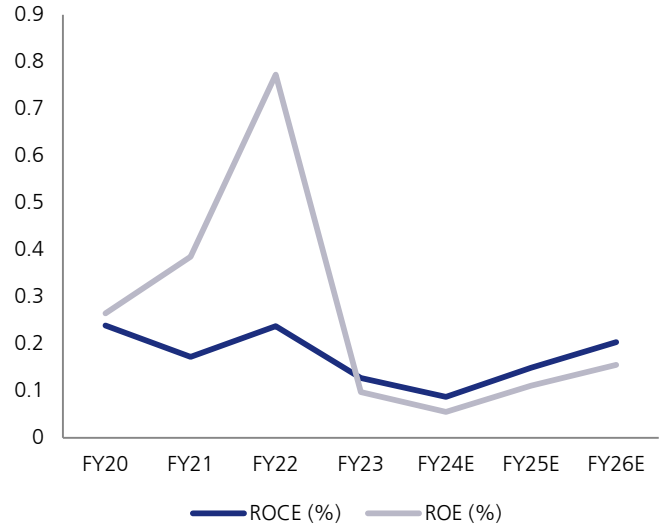
Source: Company, JM Financial

Exhibit 36. FCF conversion will be negative due to ongoing capex



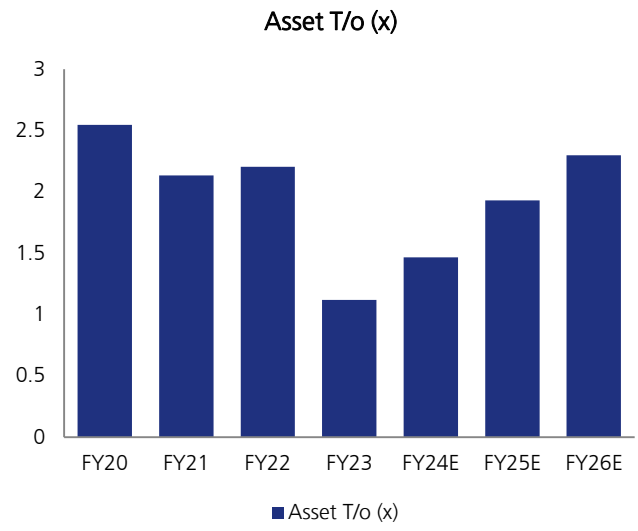
Source: Company, JM Financial

Exhibit 37. RoCE & RoE impacted in FY23 because of IPO reserves; however, this will be back to normal levels over FY24-26



Source: Company, JM Financial

Exhibit 38. Asset T/o to improve with normalisation of capex + strong revenue growth.



Source: Company, JM Financial

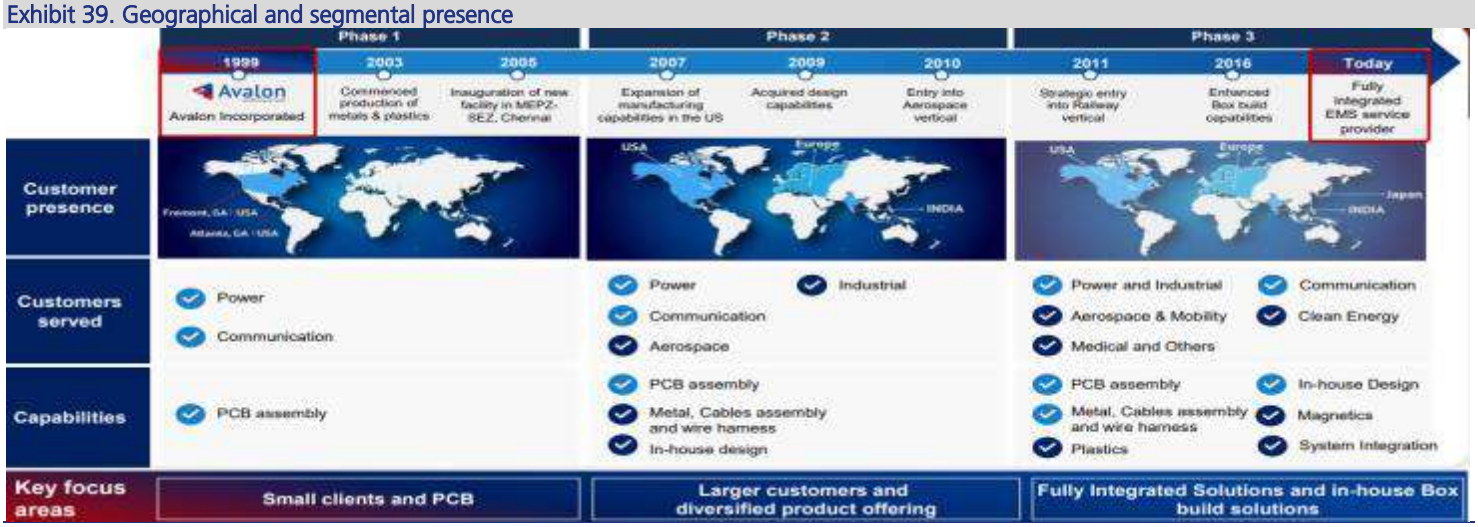
Outlook and Valuation

- **In short term**: Weak global markets and sub-par domestic growth will impact volume and margin in 4Q. However, domestic business will continue to set off loss-making US operations.
- **In mid-long term**: We expect over the next 2-3 years, Avalon will see strong profitable growth led by: (1) Higher share of Box builds among peers, plus developing ODM and vertical integration, (2) Long product life + Customer stickiness, (3) Increasing share of clean energy, where the industry itself is poised for 87% CAGR over FY22- 26, (4) Continuous focus on adding new customers in segments such as industrial (EV), mobility, and aerospace, along with increasing wallet share among existing customers, (5) Strong domestic order book traction, along with growing exports business and (6) Strong industry tailwinds.
- With all this, We expect Avalon to see revenue/EBITDA/PAT CAGR of c.36/59%/94% over FY24-26, with gross margin of c.35.9/35.4/35.4% and OPM of 7.0/8.6/9.6% in FY24/25/26. We see strong earnings growth of c.126%/66% in FY25/FY26 respectively, improved RoCE/RoE of c.15%/11% in FY26, and better working capital, based on which we value Avalon at 36x FY26 EPS to arrive at a target price of INR 619 and initiate with BUY rating

About Company

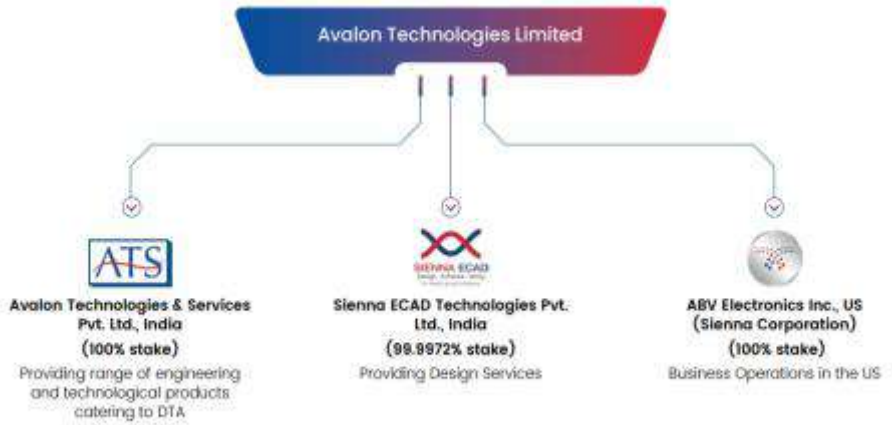
Avalon was incorporated by Mr Kunhamed Bicha and Mr Bhaskar Srinivasan, who have 2+ decades of experience in the field of EMS. Avalon started in 1999 at Chennai, India, as a manufacturing facility catering mainly to ABV Electronics Inc, USA. It has 12 manufacturing units across USA and India: 1 unit in Atlanta, Georgia and 1 in Fremont, California, 7 units in Chennai, Tamil Nadu, 1 in Kanchipuram, Chennai and 2 units in Bengaluru, Karnataka. EMS facilities comprise a total of 65 production lines, consisting of 10 SMT lines, 12 through-hole-technology lines and 43 assembly lines.

Exhibit 39. Geographical and segmental presence



Source: Company, JM Financial

Exhibit 40. Avalon subsidiaries



Source: Company, JM Financial

A competent and experienced management in place across segments

Exhibit 41. Key managerial personnel

Name	Designation	Education	Experience
Michael Robinson	COO - Manufacturing operations in US	Bachelor's degree in Science from Polytechnic Institute, US	Prior experience with Motorola, Wconnect LLC
RM Subramaniam	CFO - Avalon and its subsidiaries	Bachelor's degree in civil engineering from BITS and PGDM from IIM, Bangalore	Prior experience with A.F. Ferguson & Co Cairn Energy India Pty. Ltd. and Essar Oil Ltd.
Shamil Bicha	VP, Business Development	Bachelors in mechanical engineering from University of Madras	Prior experience with Applied Materials
Kesavan P	VP, Operations	Attended first year of diploma course in telecommunication from MEI Polytechnic, Bengaluru	Prior experience: Quest Smartech Pvt. Ltd., Texmaxo Micro Indo Utama, Sun Fiber Optics Pvt. Ltd., MiniCircuits Ltd
Arjun Balakrishnan	VP, Corporate Strategy	Holds an MS (engineering) from University of Texas, US and an MBA from Harvard University, Boston, US	Prior experience: Holm Industries, GE Power Controls India Ltd., Panasonic India Pvt. Ltd.
O J Satish	VP, PCB & Semiconductor Engineering	Holds Bachelors in Engineering from Annamalai University and PGDM (operations management) from IGNOU	Prior experience: Alpha-Imager Pvt. Ltd.
Savita Ganjigatti	VP, Engineering (PCB design and analysis)	Holds a bachelors in engineering and masters in technology from Visvesvaraya Technology University, Belgaum	Prior experience: Karnataka Telecom Ltd., Alpha-Imager Pvt. Ltd.
Harold Frederick Schilb III	VP, Business Development	Holds bachelors in science (electrical engineering) from Northeastern University, Massachusetts, US and an MBA from Fairleigh Dickinson University, US	Prior experience: Dwfritz Automation LLC, Celestica Corporation, Electri-Cord Manufacturing Co, IEC Electronics Corp, etc.

Source:, Company, JM Financials

Financial Tables (Consolidated)

Income Statement (INR mn)

Y/E March	FY22A	FY23A	FY24E	FY25E	FY26E
Net Sales	8,407	9,447	8,562	11,474	15,937
Sales Growth	21.8%	12.4%	-9.4%	34.0%	38.9%
Other Operating Income	0	0	0	0	0
Total Revenue	**8,407**	**9,447**	**8,562**	**11,474**	**15,937**
Cost of Goods Sold/Op. Exp	5,541	6,067	5,484	7,417	10,294
Personnel Cost	1,314	1,605	1,824	2,237	2,837
Other Expenses	577	647	651	838	1,275
EBITDA	**975**	**1,128**	**603**	**982**	**1,532**
EBITDA Margin	11.6%	11.9%	7.0%	8.6%	9.6%
EBITDA Growth	47.5%	15.6%	-46.6%	62.9%	56.0%
Depn. & Amort.	180	197	232	257	287
EBIT	795	931	371	724	1,244
Other Income	109	144	140	160	170
Finance Cost	248	348	145	73	71
PBT before Excep. & Forex	656	727	366	812	1,344
Excep. & Forex Inc./Loss(-)	200	0	0	0	0
PBT	856	727	366	812	1,344
Taxes	183	202	101	211	347
Extraordinary Inc./Loss(-)	0	0	0	0	0
Assoc. Profit/Min. Int.(-)	0	0	0	0	0
Reported Net Profit	674	525	265	601	997
Adjusted Net Profit	**647**	**525**	**265**	**601**	**997**
Net Margin	8.0%	5.6%	3.1%	5.2%	6.3%
Diluted Share Cap. (mn)	58.0	58.0	58.0	58.0	58.0
Diluted EPS (INR)	**11.6**	**9.1**	**4.6**	**10.4**	**17.2**
Diluted EPS Growth	192%	-22%	-49%	126%	66%
Total Dividend + Tax	0	0	0	0	0
Dividend Per Share (INR)	0.0	0.0	0.0	0.0	0.0

Source: Company, JM Financial

Balance Sheet (INR mn)

Y/E March	FY22A	FY23A	FY24E	FY25E	FY26E
Shareholders' Fund	872	5,370	4,819	5,420	6,417
Share Capital	16	116	116	116	116
Reserves & Surplus	856	5,254	4,703	5,304	6,301
Preference Share Capital	0	0	0	0	0
Minority Interest	0	0	0	0	0
Total Loans	2,941	3,063	1,019	519	519
Def. Tax Liab. / Assets (-)	0	0	0	0	0
Total - Equity & Liab.	**3,812**	**8,433**	**5,838**	**5,939**	**6,936**
Net Fixed Assets	1,142	1,428	1,384	1,506	1,588
Gross Fixed Assets	1,615	1,964	2,275	2,654	3,024
Intangible Assets	0	0	0	0	0
Less: Depn. & Amort.	493	689	921	1,179	1,466
Capital WIP	20	153	30	30	30
Investments	0	0	0	0	0
Current Assets	4,737	10,375	7,684	8,640	11,074
Inventories	2,330	3,179	2,830	3,665	4,958
Sundry Debtors	1,774	2,062	1,869	2,422	3,276
Cash & Bank Balances	101	4,222	2,150	1,464	1,365
Loans & Advances	66	91	91	91	91
Other Current Assets	466	821	744	997	1,384
Current Liab. & Prov.	2,067	3,370	3,230	4,207	5,727
Current Liabilities	1,185	1,418	1,356	1,778	2,441
Provisions & Others	882	1,953	1,874	2,429	3,286
Net Current Assets	2,670	7,005	4,454	4,433	5,347
Total – Assets	**3,812**	**8,433**	**5,838**	**5,939**	**6,936**

Source: Company, JM Financial

Cash Flow Statement (INR mn)

Y/E March	FY22A	FY23A	FY24E	FY25E	FY26E
Profit before Tax	856	727	366	812	1,344
Depn. & Amort.	180	197	232	257	287
Net Interest Exp. / Inc. (-)	229	306	5	-87	-99
Inc (-) / Dec in WCap.	-848	-1,125	479	-665	-1,014
Others	-153	-48	0	0	0
Taxes Paid	-125	-189	-101	-211	-347
Operating Cash Flow	**139**	**-133**	**981**	**106**	**171**
Capex	-159	-273	-188	-379	-370
Free Cash Flow	-21	-406	793	-273	-199
Inc (-) / Dec in Investments	0	0	0	0	0
Others	-6	2	140	160	170
Investing Cash Flow	**-166**	**-271**	**-48**	**-219**	**-200**
Inc / Dec (-) in Capital	-68	4,815	0	0	0
Dividend + Tax thereon	-38	-37	0	0	0
Inc / Dec (-) in Loans	158	48	-2,044	-500	0
Others	-261	-280	-145	-73	-71
Financing Cash Flow	**-209**	**4,545**	**-2,189**	**-573**	**-71**
Inc / Dec (-) in Cash	**-236**	**4,141**	**-1,256**	**-686**	**-99**
Opening Cash Balance	313	78	3,403	2,147	1,461
Closing Cash Balance	78	4,219	2,147	1,461	1,361

Source: Company, JM Financial

Dupont Analysis

Y/E March	FY22A	FY23A	FY24E	FY25E	FY26E
Net Margin	8.0%	5.6%	3.1%	5.2%	6.3%
Asset Turnover (x)	2.4	1.5	1.2	1.9	2.5
Leverage Factor (x)	6.1	2.0	1.4	1.2	1.1
RoE	116.7%	16.8%	5.2%	11.7%	16.8%

Key Ratios

Y/E March	FY22A	FY23A	FY24E	FY25E	FY26E
BV/Share (INR)	15.0	92.7	83.2	93.5	110.7
ROIC	18.9%	17.0%	6.8%	13.1%	18.4%
ROE	0.0%	0.0%	0.0%	0.0%	0.0%
Net Debt/Equity (x)	3.3	-0.2	-0.2	-0.2	-0.1
P/E (x)	44.1	56.6	112	59.5	29.8
P/B (x)	34.1	5.5	6.2	5.5	4.6
EV/EBITDA (x)	33.4	25.4	47.5	29.3	18.9
EV/Sales (x)	3.9	3.0	3.3	2.5	1.8
Debtor days	77	80	80	77	75
Inventory days	101	123	121	117	114
Creditor days	58	62	62	62	62

Source: Company, JM Financial

APPENDIX I

JM Financial Institutional Securities Limited

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Hold	Price expected to move in the range of 10% downside to 10% upside from the current market price for stocks with market capitalisation in excess of INR 200 billion and REITs* and in the range of 10% downside to 15% upside from the current market price for all other stocks, over the next twelve months.
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