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April 17, 2025

Key Themes: Finding Market Dominance and Technology Leadership

Overview:
We continue to pursue our goal of identifying and performing research on market leaders in Japan that possess strong competitive advantages, market dominance, decades of high global market share, and superior technologies/IP for the next secular growth stories.

We tried to accomplish this through our research work in Tokyo, Japan between February 26th to March 7th. We visited Japanese companies and conducted meetings with managements and investor relations at the SMBC-Nikko and Daiwa conferences which are the two largest annual investment conferences in Japan. We had meetings with 32 companies including four company visits and two company dinners. We selected companies that we found compelling, conducted more research, and presented them in this report.

The list of companies we had meetings with:

- **Fabless Semiconductor:** Socionext (6526.T)
- **Semiconductor Integrated Design Manufacturers:** Renesas (6723.T), Rohm (6963.T), Sanken Electric (6707.T)
- **Technology/Semiconductor Capital Equipment:** Disco (6146.T), Lasertec (6920.T), Yaskawa Electric (6506.T), Screen Holdings (7735.T), Kokusai Electric (6525.T), Horiba (6856.T), Tokyo Seimitsu (7729.T), Ulvac (6728.T), Towa (6315.T)
- **Technology/Semiconductor Materials/Components:** Shin-Etsu Chemical (4063.T), Delta Electronics (2308.TPE), TDK Corporation (6762.T), Nidec (6594.T), Dai Nippon Printing (7912.T), Nikon (7731.T), Tokyo Ohka Kogyo (4186.T)
- **Entertainment/Media:** Konami (9766.T), Capcom (9697.T), Square Enix (9684.T), Koei Tecmo (3635.T), Sega Sammy (6460.T), Kadokawa (9468.T), JP Games (Private)
- **Diversified Tech:** Sony (6758.T), Murata (6981.T)
- **Electronic Contract Manufacturer:** Honhai Precision Industry/Foxconn (2317.TPE),
- **Other Tech:** Fujitsu Limited (6702.T), Sharp (6753.T), Macnica (3132.T)

Since the last time we conducted our research due diligence in Japan in 2023, Japanese companies have started to demonstrate stronger affinity toward return of capital to shareholders and made progress in corporate efficiency measures. We believe that many companies are still conservative with the use of their cash, but some like Shin-Etsu Chemical have put an upper limit to the company's cash balance. Some challenges that we heard frequently during management discussions were talent acquisition and retaining that talent which have been problems with shortage of skilled labor and uncompetitive wages offered by Japanese companies vs. international companies. We believe that many of the Japanese companies hold strong competitive positions in niche applications and the media companies have plethora of IP that are growing in popularity internationally.

Semiconductor Themes: Geopolitics, China, AI, and Cyclical Market Recovery
Overall themes for semiconductor-related companies have been geopolitics specifically on China, sustainability of sales, discrepancy among sales to individual customers (customers in semi equipment are limited to few major players), semiconductor generational transition to advanced nodes and architecture, and end-market cyclicality. Many semiconductor equipment companies including Japanese companies have significantly traded down from March-June 2024 peak mainly due to geopolitical issues, concerns around sustainability of sales to Chinese customers, prolonged weaknesses in traditional semiconductor markets, and extended delay of the start of a market recovery.

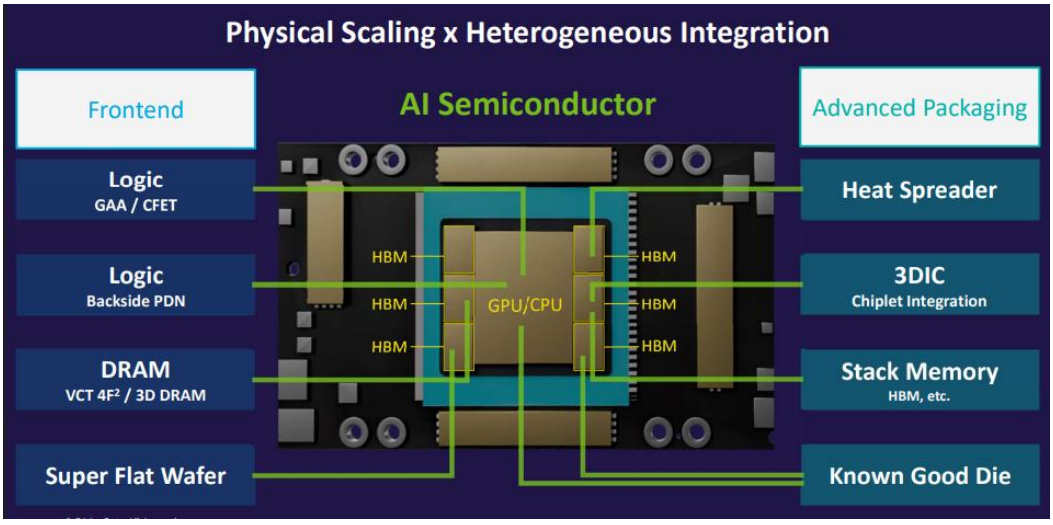
We favor Japanese semi equipment companies due to their strength and high market share in niche and crucial areas of semiconductor manufacturing. For example, Kokusai Electric (6525.T) has 70% market share in Batch Atomic Layer Deposition (ALD) which is an advanced thin-film deposition technique critical for the increasingly complex next generation semiconductor manufacturing process.

Many of the Japanese semiconductor design and manufacturing companies such as Rohm (6963.T), Sanken Electric (6707.T), and Renesas (6723.T) are also struggling given their exposure to automotive and industrial end-markets which are undergoing inventory corrections and cyclical downcycles. Japanese semiconductor designers typically have higher exposure to mature nodes with lower exposure to advanced nodes. They have lower AI-tailwinds but can gain momentum from a cyclical recovery in automotive and industrial end markets. However, most companies do not want to call out a recovery in the near-term, and are looking more at the mid-term growth opportunities. While the current market downturn has lasted longer than prior ones, it appears that many companies believe that the current market downturn will last for at least most of CY 2025 and have mentioned that some bullish companies like Analog Devices typically are overly optimistic on their earnings calls regarding the semiconductor industry outlook. Therefore, we take a more cautious approach to a market recovery story in 2025 given that there seems to be limited visibility into demand recovery and the ongoing excess inventories are worse than past historical downturns.

On tariff impacts, semiconductors have been excluded from reciprocal Trump tariffs. We believe that there is a high likelihood that semiconductor-related tariffs would be addressed separately. Overall, when we met with Japanese companies, they expressed optimism that Japan will be exempt from tariffs but that has not been the case, and we believe some companies may be unprepared for tariff impacts. If viewed optimistically, the higher tariff rates on China can be overall net positive for Japanese semiconductor companies' competitive position and potentially as a destination for manufacturing bases. Another major geopolitical concern surrounds further export restrictions against China which will directly affect sales of Japanese companies which are levered to China.

Another major central theme that continues to dominate conversations in the semiconductor industry is the advanced manufacturing node transition. AI is driving strong spending on selective areas of the most advanced semiconductor manufacturing (Exhibit 1), especially the transition phase to next gen semiconductors via TSMC's 2nm and Intel's 18A. Due to the increased complexity and miniaturization of next gen semiconductors, there are shifts to 3D architectures like Gate All Around (GAA), Backside Power, and advanced packaging. These architecture changes will not only drive market growth in both front-end wafer fab equipment and back-end assembly/test operations (Exhibit 2) but also will be incrementally positive for semiconductor equipment companies.

Exhibit 1 AI Semiconductor Requires Significant and Advanced Innovation

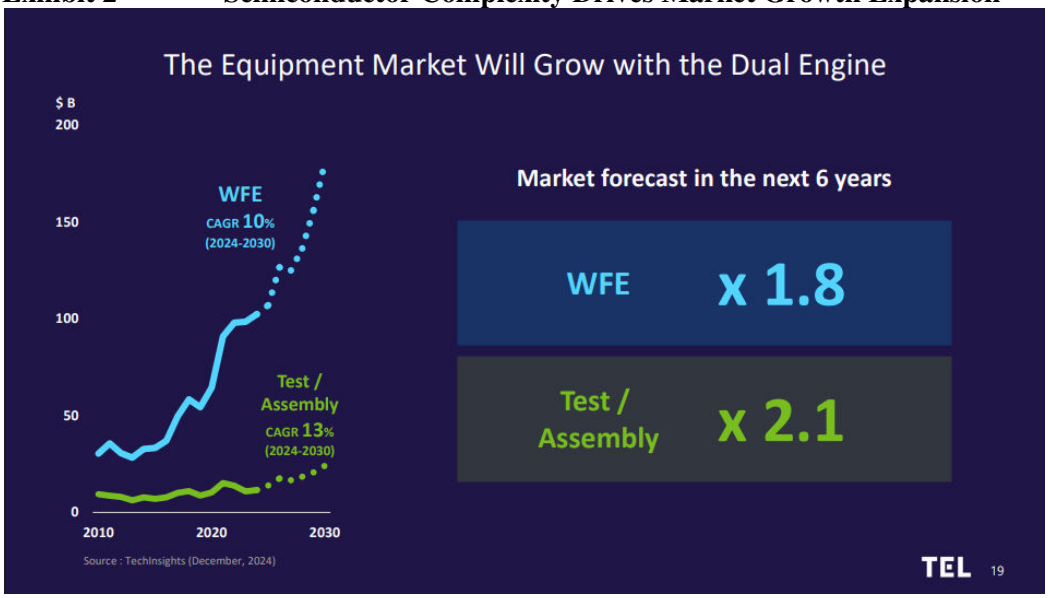


Source: Tokyo Electron

A major technological transition is generally a pivotal moment for either the laggards to flip their market share position or the market leaders to maintain their position. One example is the competition between Disco (6146.T) and Tokyo Seimitsu (7729.T) who both design dicer and grinder equipment, which are used in important processes to separate individual chips from a semiconductor wafer. This equipment will likely receive new design requirements due to the transition to the 3D architecture, which can present opportunity for a laggard such as Tokyo Seimitsu to win contracts and catch up in market share against the market leader in Disco.

The buyers of semiconductor equipment are now highly consolidated. There are only three primary buyers in the advanced semiconductor manufacturing, which are TSMC, Intel, and Samsung. However, only two of these manufacturers, Intel and Samsung, are struggling and reducing/pausing their capital spending. TSMC is the one and only strong buyer here. This has been a contention spot for semiconductor equipment players as there is an overhang that TSMC's market dominance, which means that TSMC can leverage even greater pricing power over semiconductor equipment players. Many equipment companies have mentioned that market consolidation and one player dominance are overall a net negative for semiconductor equipment companies.

Exhibit 2 Semiconductor Complexity Drives Market Growth Expansion



Source: Tokyo Electron IR Slide

Video game Themes: IP, Pipeline, and Future Opportunities

Themes for video game companies have been strength of IP, M&A opportunities, game pipeline, multimedia approach, and live service/mobile games. Many Japanese video game companies have strong well-known IP but at the same time have been behind in approaches to live service/mobile games. Specifically, Japanese mobile games have been mediocre compared to recent success in the Chinese mobile game industry which has demonstrated notable success internationally through titles like MiHoYo's *Genshin Impact*. Thus, Japanese video game companies have talked less on live service/mobile games and more on AAA single player titles of their renowned IPs. The theme here has been on reviving dormant IPs such as Konami's (9766.T) *Metal Gear* and *Silent Hill*. Japanese video game companies have started to focus on AAA games (higher budget) over A/AA games (lower budget), to concentrate on high-quality titles that sell better, rather than targeting quantity of AA games which sell significantly worse even vs. expectation like Square Enix's (9684.T) *Vision of Mana*. In terms of rising development costs of AAA games, smaller companies like Koei Tecmo (3635.T) have opted to co-develop AAA games with larger companies such as Microsoft or Sony in order to manage, spread, lower, and divide the risk in case the games underperform. Finally, most Japanese game companies want to prioritize acquisitions of IP to broaden their portfolio over talent/studios except for Capcom (9697.T).

Major themes for 2025 will be the launch of *Nintendo Switch 2* (7974.T) on June 5th, 2025 and the release of the highly anticipated game by TakeTwo Interactive (TTWO), *Grand Theft Auto VI*, in Fall of 2025. Capcom, Koei Tecmo, Square Enix, and Kadokawa (FromSoftware) have all announced games for the new Nintendo Switch 2 coming out this year. And in terms of release schedule, every video game company has acknowledged that they would like to avoid a fall release window given the highly anticipated release of *Grand Theft Auto VI*.

On tariff implications, videogame hardware will be affected such as Sony's PS5 and Nintendo's upcoming Nintendo Switch 2. Sony uses contract manufacturers to manufacture and assemble PS5 in China and South East Asia. Nintendo manufactures its Nintendo Switch 2 in Vietnam and China. We are unsure whether there will be any price increases given the tariffs but we believe that if tariff rates stay at 10% for Vietnam, there will not be a price increase.

Other Company Themes: Growth Beyond Japan

Japanese entertainment companies are trying to grow their international exposure. For example, Kadokawa's main growth driver now is to accelerate the growth of Japanese anime internationally and has been the main reason behind Sony's share stake in Kadokawa. This is a similar strategy that Koei Tecmo (3635.T) is taking with their games where they excel at making Asian-themed games and are doubling down on these efforts.

Economic Trends: Inflation, Interest Rate, Income, and Trade

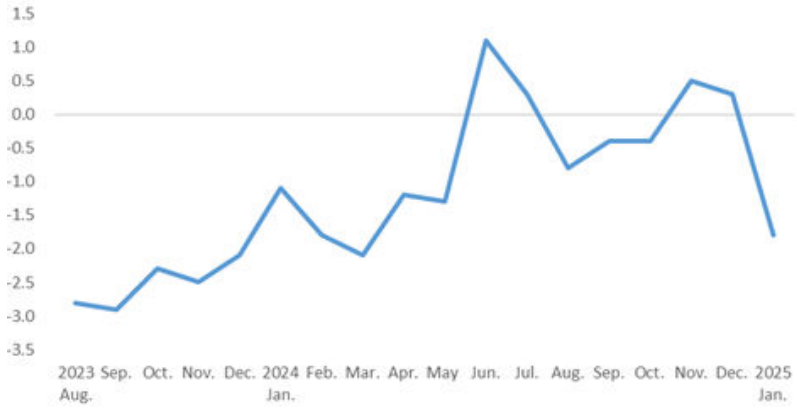
The Japanese Yen has been weak against the USD since the start of interest rate hikes by the U.S. Fed in 2022. Japan has long been a stagnant country with little to no growth as seen through three decades of deflation. Now, after the global inflation that started around 2022, Japan was led to supply-driven inflation (import-driven) which allowed for a nominal wage increase to happen. Japanese headline inflation rate has stayed above Bank of Japan's target rate of 2% for 34 consecutive months which is the main reason why BOJ started its phase of monetary tightening by ending negative interest rates and quantitative easing. The 10-year Japanese government bond yield is at 1.28%, the highest its been in more than a decade (Exhibit 3), reflecting shifts in expectations of BOJ's monetary policy in the near-term and the consensus is that BOJ will increase interest rates sometime again in 2025 even with the ongoing tariff concerns. In the last meeting, BOJ held the interest rates steady as it was seeing "high uncertainties surrounding Japan's economic activity and prices, including the evolving situation regarding trade and other policies." We believe that BOJ will take a "wait and see" approach with the tariff situation.

Exhibit 3 Japan 10 Year Government Bond Yield Over 10 Years

Source: Bloomberg

One recurring question facing Japanese companies is talent attraction and retention, and wage increases. In its outdated fashion, most wage negotiations in Japan happen during the spring through Shunto, which means Spring Offensive. The wage increase negotiated in 2024 was 5.1% YoY and the first wage increase above 5% since 1991. As expected, wage increases negotiated in larger companies were higher than those of small and medium sized companies. Rengo, one of Japan's largest unions, has negotiated a wage increase of 5.46% rise in wages beginning in April 2025. As seen in Exhibit 4, nominal wages have not been catching up with inflation even with wage increases.

Exhibit 4 **Japan Real Wages on a YoY Basis**



Source: Ministry of Health, Labor and Welfare of Japan

Regarding trade, Trump has put a pause on the reciprocal tariffs for 90 days but has continued the 10% baseline tariffs for most countries including Japan. The contentious point for Trump administration regarding Japan was obviously the trade deficit. In 2024, Japan had an approx. $68.5 billion trade surplus in goods with the U.S. which the U.S. imported $148.2 billion from Japan and exported $79.7 billion to Japan. A large portion of U.S. imports from Japan came from machinery and mechanical applications and transportation equipment. Thus, Trump's main goal here is to pressure Japanese machinery and auto makers to relocate manufacturing to the U.S. to cut the deficit. On the other hand, Japan owns $1.08 trillion worth of U.S. treasuries which can be used as a tool in trade talks. Although it is uncertain whether Japan has sold off significant amounts of U.S. treasuries recently given the rise in the U.S. 10 year treasury yield, previous net selling has mostly been to control Japanese yen currency against U.S. dollar.

Politics

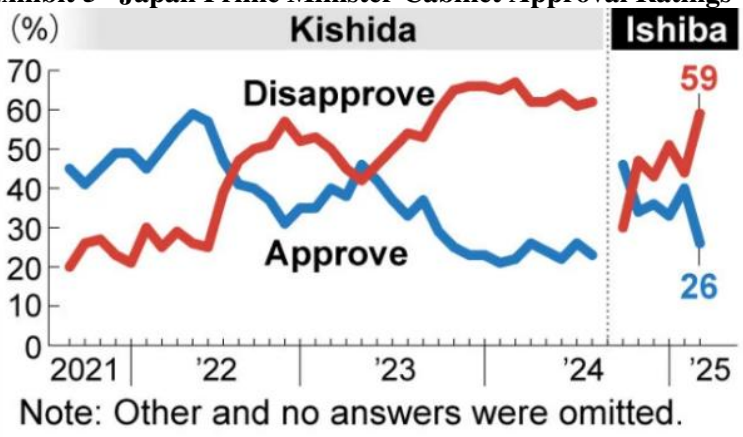
As expected, geopolitics was the main issue surrounding many of the companies which centered around sales in China. Clearly, geopolitics will affect semiconductor companies most as export restrictions were the major risks surrounding the equipment companies. As explained above, Trump 10% tariff implications are uncertain but Japanese companies have been optimistic that there is room for negotiation and some companies may have a chance to be exempt given their investments in the U.S. Further, we also see a consequential risk that a tighter restriction on China may lead to a nation-wide lower capital spend on semiconductor in general that affect many companies, including Japanese suppliers of equipment and materials.

Japanese politics has also entered a unique situation as well. Last October, newly elected prime minister Shigeru Ishiba, did a snap election which backfired as Ishiba's party Liberal Democratic Party (LDP) and New Komeito party lost their majority in the house securing only 215 seats out of the total 465 seats. Prime Minister Ishiba has also been unpopular with the Japanese public as his latest approval rating was 26% according to an Asahi Shimbun poll (Exhibit 5). Ishiba's main policies are regional revitalization 2.0, strengthen support of core industries such as agriculture, increase Japan's defense budget, and continue to strengthen ties with the U.S. Some Japanese management teams have expressed concern that Prime minister Ishiba does not have a strong economical background, and is more defense focused.

For monetary policy, Ishiba has vowed not to intervene with Bank of Japan and will let them run its course on monetary tightening. On the fiscal side, Ishiba's tax policy has been a contentious topic as he first sought to raise capital gain taxes, but associated tax policy concerns have eased as he revised down the tax hikes. He seems to focus

more on economic stimulus now with investment towards domestic infrastructure and industries; thus we should still expect strong investment towards domestic semiconductor chips.

Exhibit 5 Japan Prime Minister Cabinet Approval Ratings



Source: Asahi Shimbun Survey

Japanese Financial Market: M&A and Activists

Japan's Tokyo Stock Exchange (TSE) and the Japanese government have been pushing for better corporate governance from Japanese companies. The TSE reforms encouraged companies to increase disclosures and to improve corporate efficiencies. TSE isn't directly enforcing these actions but has used a name and shame approach such as publishing lists of companies that comply with TSE's new reforms and omitting those who weren't complying. Additionally, TSE would like more retail investors to join the market via tax-free savings schemes and encouraging companies to split their stocks.

These reforms have encouraged activist investing in Japan. According to Bloomberg, activist investment funds have bought at least 1 trillion yen or $6.6 billion worth of Japanese stocks, doubling YoY, and they now hold at least 4.8 trillion yen or around $32 billion worth of Japanese stocks. This in-turn is increasing M&A deals, as activist investors have demanded the companies to use their cash or to divest non-core assets that many Japanese companies carry. One of the companies we met with was Sanken Electric (6707.T), who has a notable activist investor, Effissimo Capital Management, who owns approx. 25% of the company. Effissimo Capital Management is now the largest activist in Japan (Exhibit 6).

Exhibit 6 Notable Activists in Japan

Source: Bloomberg

In 2023, Japan's Ministry of Economy, Trade, and Industry (METI) published "Guidelines for Corporate Takeovers." The guideline established rules to encourage companies to evaluate acquisitions based on enhancement of corporate values, making it harder for the companies to reject acquisition offers outright. METI has also made defensive measures against hostile takeovers stricter with more requirements like shareholder approval of defense measures, disclosure of alternative strategic plans if rejecting a bid, and giving shareholders a timeline to review such bids. In summary, Japanese companies have been an active market for M&A in 2024 with deals that involve Japanese companies rising 44% YoY to more than $230 billion in 2024 according to Bloomberg data. The number of Tokyo Stock Price Index (TOPIX) companies that have become M&A targets has seen a large increase, especially in 2024 as shown in Exhibit 7. We believe the current Japan stock market is now more conducive to corporate reform, financial engineering, and M&A transactions.

Exhibit 7 Acquisition of Japanese Firms on Rise
Number of Topix firms that became M&A targets

Source: Bloomberg

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Sony Group Corp (SONY - $22.55 - NYSE) Growth Expansion Mindset

COMPANY OVERVIEW
Headquartered in Tokyo, Sony is a Japanese multinational conglomerate. The principal businesses are: i) Game & Network Services, one of the world's largest integrated gaming platforms with over 123M monthly active PlayStation users, ii) Music, the second largest music company and largest publishing company globally, iii) Pictures, one of five US majors, iv) Semiconductor, the world's largest image sensor producer, v) Electronics, and vi) Financial Services.

Reason For Comment

Market leadership: #1 video game hardware platform, #1 image sensor, #1 music publisher, #2 music recording, top 5 U.S. movie studio.

We visited Sony's Tokyo HQ and had a meeting with Sony's Japanese IR team Aya Uehara, Aritomo Shinya, and Jannet Li. Our conversations mostly revolved around growth areas, semiconductor, media, and electronics businesses. We believe Sony's failures in the video game *Concord* and a Spider verse' spin-off movie of *Kraven* are hard lessons that will lead the company to exercise more scrutiny and discipline on its media pipeline. We view Sony's strategic investments in anime production and global distribution positively as they exhibit large addressable markets, relatively low capital costs, low risks, competitive advantages, and ability to lever its multiple core assets and Sony's global reputation.

- **Image Sensor Semiconductor: iPhone is still the number one growth driver. Automotive image sensor is an emerging growth opportunity with positive design win momentum.**
  - Sony had supply constraints for logic wafers in the past which it would like to prevent in the future by starting a JV with TSMC for chip manufacturing in Japan specifically for logic chips. Currently, two fabs are being built in Kumamoto and the total target capacity for these two fabs alone are 100K wafers/month. The current production capacity is 154K/month by the end of March fiscal year 2024. For future capacity expansion, Sony is looking to build more capacity based on end demand and has land in Kumamoto (southern Japan) which is where Sony and TSMC are building their semiconductor manufacturing facility.
  - Sony sees price increases based on image sensors getting bigger and more advanced. Price/chip is increasing 4% on a blended average in March FY 2025. The company believes that its latest edge image sensors will be a competitive differentiator as it can stack three layers which are two layers of pixel (transistor and photo diodes) and one logic layer. Sony believes that competitors are struggling to stack just two layers.

- **Sony Entertainment: More strategic focus and investment in cross-license media content and the global growth of anime.**
  - On recent failures such as *Concord* and *Kraven*, the company realized that they misjudged the market and missed reading expectations. On *Concord* which was a live-service game that flopped, Sony noted its quick decision to terminate was the result of a very poor launch. We believe there is no risk of impairment as the development was already expensed on the P&L. For future titles, Sony will implement more checkpoints earlier on in the development stage to align the title with market expectations.
  - On anime, production is under Sony Music. The company has internal anime production studios such as A-1 Pictures whose notable successful title is *Demon Slayer*. On the distribution side, Sony has Crunchyroll in the U.S. which is a growing and stable subscription-based business. As seen with Sony's other IP, the company is making a big push towards multi-media and is actively leveraging its renowned video game IPs for anime. For anime in China, Sony has an alliance with Bilibili, but Sony no longer owns a stake in Bilibili.

- Sony's relationship with Kadokawa will not change significantly after Sony's 10% ownership stake into Kadokawa. The transaction will bring Sony closer to Kadokawa and gain important access to consumers and local creators. Sony has no intention of "harming" Kadokawa and FromSoftware's relationship with Bandai Namco and there shouldn't be significant changes between FromSoftware and Sony. Sony intends to form a new strategic partnership with Kadokawa on new titles.

- **Sony Financial Services: Avoidance of potential sell-off post the spin-off in October 2025.**
  - Sony is aware that investors may sell-off of Sony Financial Services post the spin-off. To minimize the impact, the company is going to proactively and aggressively present and pitch Financial Services in the upcoming Sony IR day in May.

- **Electronics**
  - Major cost saving initiatives include talent transitions for employees to find careers post Sony Electronics. Therefore, we believe the outcomes of continuous cost savings will be small and incremental.

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Capcom (9697.T – JPY 3,737- TSE) Outstanding IP Monetization

COMPANY OVERVIEW

Headquartered in Osaka, Japan, Capcom is a Japanese video game developer and publisher founded in 1983. The company initially gained recognition for its arcade games in the 1980s and progressed its games to the home consoles and PC market. Currently the Capcom's largest IPs are *Resident Evil* (167 million cumulative sales), *Monster Hunter* (108 million cumulative sales), and *Street Fighter* (56 million cumulative sales). The company operates four segments which are: i) Digital Contents which develops and sells digital game content for consoles and PC, ii) Arcade Operations which manages amusement facilities, iii) Amusement Equipment which develop and manufacture arcade and pachinko machines, and iv) Other Businesses, primarily licensing for merchandising, movies, and other media. The company expects to achieve net sales of 165 billion yen and operating income of 64 billion yen (OPM of 38.8%) in FY 3/2025. The company has 418 million shares outstanding, closed at 3,737 JPY, market cap of 2 trillion Japanese yen, net cash of 117.6 billion Japanese yen, total enterprise value of 1.9 trillion Japanese yen.

Reason For Comment

Market leadership: Outstanding execution on monetization of current IP than peers. Strong Hit Game Monster Hunter Wilds released recently.

We had a group meeting with Capcom's IR, Yoshikazu Shimauchi, Ryohei Okada, and Daniel Levine at Daiwa Conference. We believe Capcom has done outstanding execution on monetizing its IP, while other video game companies have been struggling and the video game market has been weak and seeing lack of successful new launches.

- **Recent Successful AAA Title: Monster Hunter Wilds**
  - Capcom released its long-awaited blockbuster title, *Monster Hunter Wilds*, on February 28, 2025 which was priced at $69.99. The game was released simultaneously on Xbox, PS5, and PC and sold 8 million copies in three days which made it Capcom's fastest selling game in the company's history. The game's predecessor, *Monster Hunter Worlds* released in 2018 sold 28.1 million copies and *Monster Hunter Rise* released in 2021 sold 16.7 million copies. The game took six years to develop. We believe that *Monster Hunter Wilds* will sell more lifetime copies than *Monster Hunter Worlds*.
  - Capcom launches titles with a five-year plan which sets the game up for strong repeat sales and profit contribution. We should expect regular free updates and a large paid major update, which we believe will carry a price point of around $30-40. The large paid update is expected to release in two years given previous game's update timeline.
  - In terms of accounting, the development cost will be recognized in cost of goods sold after release from Work-in-progress asset line on the balance sheet. The initial development cost will be amortized over a set period, around 18 months. The revenue and profit will also be deferred based on the portion of the game that comes after the release. The company will put the value of updates going forward and defer revenue based on that perceived value. Development cost is typically recouped after 1-2 years post initial launch and thereafter is essentially all profits.

- **Mid-term strategy**
  - Capcom's mid-term financial strategy is to grow its operating income by 10% each year. The company has been successful at growing its operating income from 12 billion yen in FY 3/2016 to 57 billion yen in FY 3/2024 which was a CAGR of 21.5%. The company will achieve this through its repeat sales strategy where the company will monetize each title through a five-year plan.
  - The company will try to achieve 100 million video game unit sales annually. Currently, the company forecasts around 50 million units in FY 3/2025. The company will approach this through increasing focus on the PC market and expand geographically to underpenetrated country/regions. The company sees currently a highly profitable digital sales ratio of ~90% and PC ratio of over 50%.

- **Capital Allocation:**
  - As of December 31, 2024, Capcom has net cash of approx. 120 billion yen. The company is conservative in its cash use and will not be aggressive in the M&A market. The company has no intention of acquiring additional IP and would rather develop IP internally and grow them organically. The M&A Capcom would do will be more limited in size and mainly companies that have worked with Capcom previously.

Exhibit 8 Capcom's Monetization "Engine" Strategy

■ **Long-term sales of high-quality titles**

• Major IP contribute long-term, both as new titles and on into high-margin catalog sales

(ten thousand units)

	17/3	18/3	19/3	20/3	21/3	22/3	23/3	24/3	Cummulative unit sales	25/3 (Plan)
Resident Evil 7 biohazard	350	160	120	100	150	180	120	130	1,330	Continue to contribute as catalog titles
Monster Hunter: World*		790	450	450	230	170	140	280	2,530	
Resident Evil 2			420	240	160	140	220	200	1,390	
Monster Hunter World: Iceborne				520	240	140	100	230	1,260	
Resident Evil 3					390	110	190	170	870	
Monster Hunter Rise					480	410	370	190	1,470	
Resident Evil Village						610	180	180	980	
Monster Hunter Rise: Sunbreak							540	220	770	
Resident Evil 4							370	330	700	
Street Fighter 6								330	330	
Dragon's Dogma 2								260	260	

*Includes sales of *Monster Hunter World: Iceborne Master Edition.*

Sales numbers rounded down to 10 thousand units. As of March 31, 2024.

Resident Evil 7 biohazard
8 consecutive years of over 1 million units in sales

Monster Hunter: World
Highest-selling title in Capcom history

Resident Evil 4
Anticipate further sales going forward

Source: Capcom

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April 17, 2025

Sanken Electric (6707.T – JPY 7,023- TSE) Multiple Catalysts to Improve

COMPANY OVERVIEW

Headquartered in Saitama, Japan Sanken Electric is a leading semiconductor Integrated Design Manufacturer founded in 1946. The company specializes in integrated circuits, power management ICs, motor drivers, power modules, Intelligent Power Modules, and discrete semiconductor like Power MOSFETs and IGBTs serving various industries like automotive, home appliances, industrial equipment, office automation, and green energy. The company expects to achieve 118.3 billion yen and operating loss of (5.6) billion yen in FY 3/2025. The company has 23.47 million share outstanding, closed at 7,023 JPY, market cap of 176.3 billion yen, plus net debt of 1.4 billion yen, less equity ownership of Allegro Microsystems of 184 billion yen, total enterprise value of (6.3) billion yen.

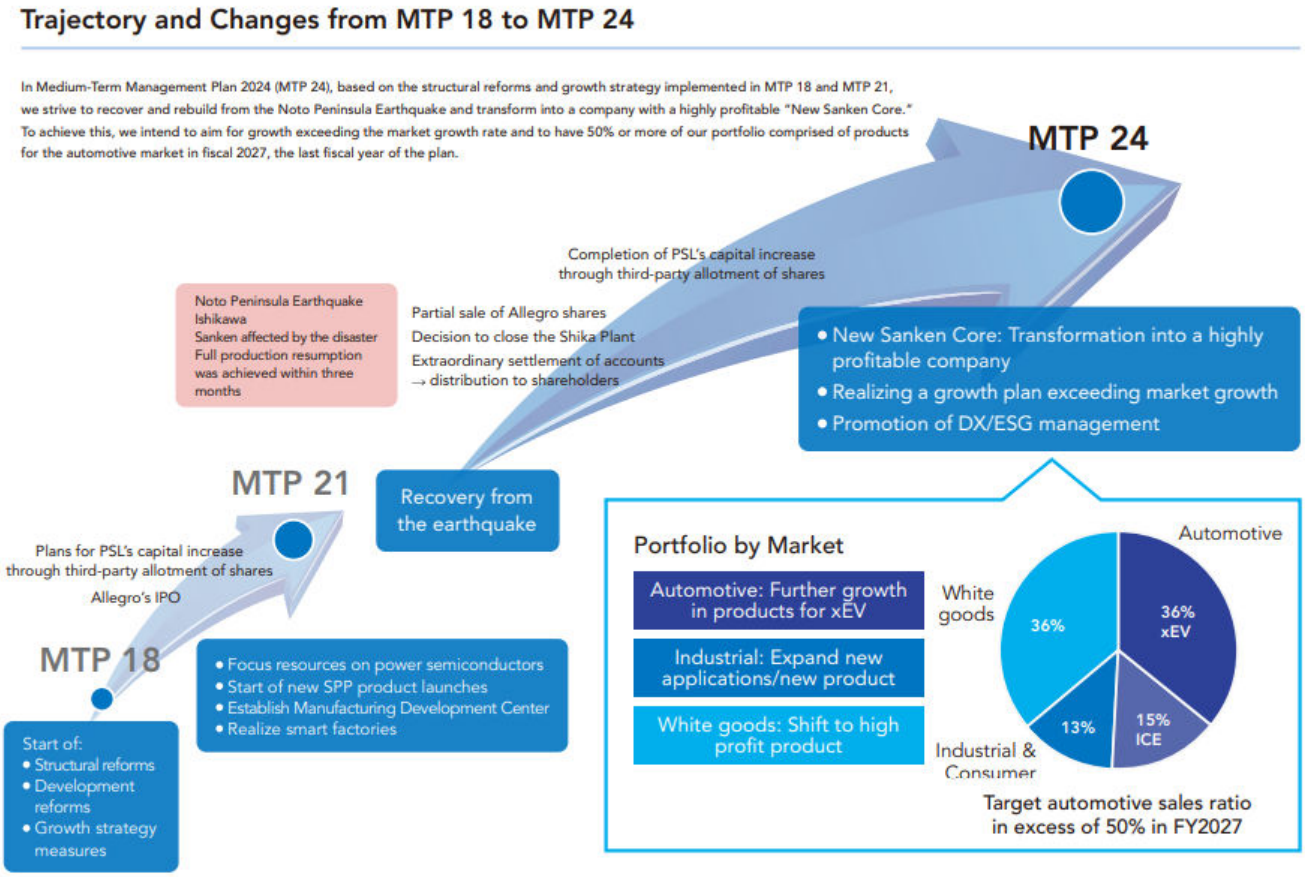
Reason For Comment

We had a group meeting with Sanken Electric's CEO, Hiroshi Takahashi, general manager, Hirokazu Maruo, and IR, Takuya Iwata and Eriko Kataoka. We believe Sanken Electric has developed and initiated the right and realistic strategies to improve its profitability.

- **Turnaround Story: Multiple potential catalysts to improve profitability.**
  - At this time, Sanken Electric is struggling with profitability and has had lower margins compared to competitors. The company also was significantly affected by Noto Peninsula Earthquake in 2024 which led to the closure of Shika Plant and production was negatively affected for three months post-earthquake. The total impact from the earthquake was around 8-10 billion yen. Additionally, because of the earthquake, Sanken Electric sold down its stake in Allegro Microsystems (ALGM) from ~51% to 32% to raise cash which was affected by the earthquake. The CEO told us that Sanken Electric would have not sold down the stake if not for the earthquake. Currently, the company is facing macro issues such as the EV market being weaker than expected and thus suspended some investments into the automotive space.
  - We believe that Sanken Electric has not been able to negotiate pricing effectively as the company has been focused on becoming an engineering company. This means that even though the product portfolio is attractive, the company may have given its customers favorable pricing that doesn't reflect the value-add that Sanken's semiconductors have with only 0.5% OPM. The company intends to improve the operating profit through higher new products ratio by setting up development gate management ensuring that only profitable new products are brought onto the market. Management will try to achieve this through reductions in COGS primarily in fixed costs (fab-lite), material changes and pricing adjustments. Management is targeting 10% OPM by FY 3/2028. We believe this can be achievable mainly through price negotiation, cyclical recovery in the auto and industrial market, and change in product mix.
  - The company has #2 market share behind Mitsubishi Electric in Intelligent Power Modules (IPM) which are power electronic semis that combine power switching components with control and protection circuitry in a single package. IPMs are commonly used in industrial equipment, automotive applications, and HVAC systems. Their main advantages are improved power efficiency, increased power density, and enhanced reliability. We believe that Sanken has strong IP in circuit technology which makes its IPM hard to copy by the Chinese and thus there is less risk of commoditization.

- **Intriguing Activist Shareholder and Sanken's Equity Ownership: Investors Get Ownership of Allegro Microsystem and Sanken Electric for Free**
  - As mentioned above, Sanken Electric used to have majority ownership of Allegro Microsystems (ALGM). The company sold down its stake to 32%, which is still larger than Sanken Electric's market cap. Sanken Electric still has two out of the nine board members on Allegro's board and the CEO described the two companies' relationship as friendly. Sanken has influence over the governance but has no influence in the day-to-day operations. Thus, due to Allegro Microsystem stake, the market is viewing Sanken Electric at negative enterprise value. What makes this even more interesting is that ON Semiconductor (ON) went public with its offer to acquire Allegro Microsystems for $35.10 per share. Based on the CEO's comments, we believe that Sanken's board members are against this deal proposal, and it is harder to do a hostile takeover on Allegro with Sanken's ownership. As of now, ON Semiconductor has withdrawn its bid to acquire Allegro Microsystems citing that Allegro's board rejected the offer as expected.
  - Effissimo Capital Management, an activist shareholder, has a 25%+ stake into Sanken Electric. It is known for its activist stake in Toshiba and is a well-known activist in Japan. The company is likely pushing for operational improvements but also pressuring Sanken to fully sell out of its stake of Allegro Microsystems. The CEO shared that he has regular dialogue with Effissimo and takes its input into account.

Exhibit 9 **Sanken Electric Mid-term Strategy**



Source: Sanken Electric

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Murata (6981.T – JPY 1,995 - TSE) Market Leader and Expansion into AI & EV

COMPANY OVERVIEW

Headquartered in Kyoto, Japan, Murata Manufacturing is a leading diversified global electronic company founded in 1944. The company specializes in designing and manufacturing, capacitors, inductors, high-frequency device and communications modules, battery and power supply, functional devices, and others. The company's products serve end markets such as automotive, telecommunications, and consumer electronics. The company expects revenue of 1.7 trillion yen and operating profit of 300 billion yen in FY 3/2025. The company has 1.86 billion shares outstanding, closed at 1,995 yen per share, market cap of 3.9 trillion yen, net cash of 542.4 billion yen, total enterprise value of 3.4 trillion yen.

Reason For Comment

Market leadership: #1 manufacturer of ceramic capacitor, 40% market share in multi-layer ceramic capacitor and secular multi-year growth opportunities in increasingly higher capacitor contents in AI infrastructure, automotive, and consumer electronics.

We had a one-on-one video meeting with Murata manufacturing's Senior Investor Relations Manager Kazuki Tatsumi at SMBC Nikko Conference. We believe Murata can lever its global market leadership in the general Multilayer Ceramic Capacitor (MLCC) to emerge strongly in highly attractive adjacent markets of AI data center infrastructure and Electric Vehicles.

- **Murata's Strength – Capacitors**
  - Murata has 40% market share in MLCC. MLCCs are components that are used for storing and discharging electricity, regulating flow of current, reducing noise in signals, filtering specific frequencies, and others. For Murata, capacitors are 45%+ of total sales and are used in markets like AI servers, communications, consumer electronics, and automobiles. There is continuous downward pressure in MLCC pricing of around high single digits which is offset by increase in number of MLCCs per new generation of technology therefore Murata can maintain a 20% OPM in this business.

- **Major markets of MLCC**
  - AI Servers, where Murata has 40% market share, is a major growth area. Large power consumption drives a larger requirement of capacitors. AI Servers typically use 5-10x amount of capacitors over traditional servers. AI servers use 10,000 – 20,000 capacitors per unit which is higher than smartphones which use around 1,200-1,500 capacitors per unit or laptops which use about 1,000 capacitors per unit. The company noted that due to higher demand than supply, the company does not see pricing pressure in MLCCs for AI servers like it does for smartphones or computers.
  - In the smartphone market, product life cycle is short. The dollar content of capacitor per unit is generally flat as higher number of capacitors is offset by annual price decline.
  - Murata forecasts high single digit growth in the automotive market in the short-term.
    - Traditional automotive products are based on older technologies and used in infotainment and traditional components.
    - Automotive power train platforms require high reliability capacitors for high voltage environment. Power train is a growth area. The transition from Internal Combustion Engine to hybrid vehicles increases the number of MLCC content to 5-10x.

- **China**
  - 50% of sales is to Chinese businesses, of which most of the Chinese customers are multinationals and sales include Apple's manufacturing of iPhones in China.
  - IP protection: 65% of Murata's capacitors are manufactured in Japan then exported to China. Murata has brought up the risks of Chinese competitors that are appearing but has assured that they are around 10 years behind in capacitor technologies and Murata is less worried on IP theft given that all of Murata's R&D centers are in Japan.

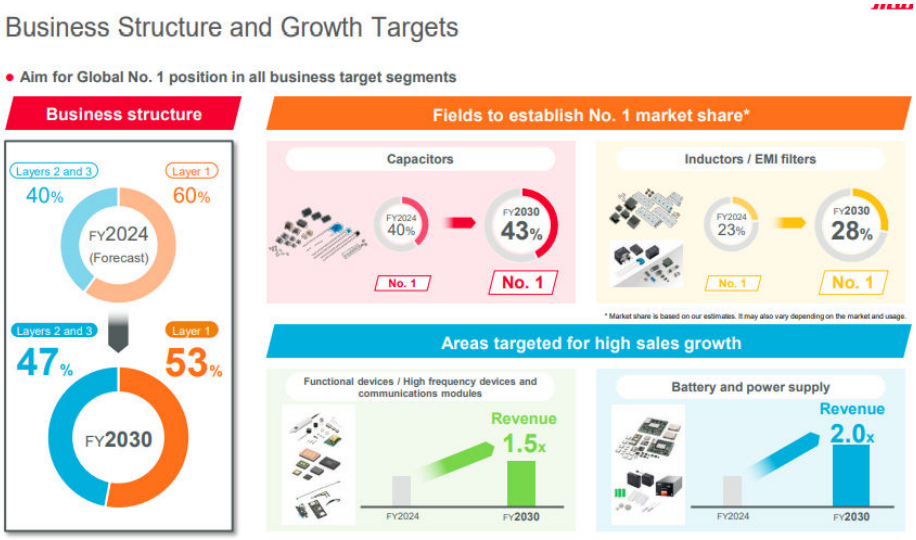
- **Challenged Battery Business**
  - Murata acquired Sony's battery business. The company terminated its smartphone battery business in 2018 due to unsuccessful market penetration in the high volume smartphone market. Sony's battery business is used to pursue custom chemical battery projects. Now, Murata is pursuing a centralized product development.
  - Murata's battery and power supply business has been struggling with profitability. The company expects its FY 2025 loss to be around 20 billion yen. Due to post-covid implications of over-ordering there was an excess inventory in the market. On the demand-side the end markets like autos have not been strong but their strengths are coming from the opportunities in AI servers. Murata believes that the business can achieve break-even in FY 3/2026 and eventually be a double-digit profit margin business. The break-even assumes a 10% growth in the top-line. As of now, Murata has no intention of exiting out of the battery business.
  - Long-term, Murata believes its battery business market can deliver CAGR 7-8%.

- **Radio Frequency (RF) business**
  - Murata's RF business generates high profitability in double-digits. It competes with Qualcomm and Skyworks. The company sees 6G connectivity will present opportunities to compete and win share.

- **Financials**
  - Gross margin: Automotive products generally have comparable or higher gross margins than smartphone products.
  - The historical operating margin of MLCC is ~20%.
  - Historical annual price reduction of MLCC
    - General: High single-digit rates
    - Smartphone: High single-digit to low double-digit rates

- **Capital Allocation and Mid-term Strategy:**
  - The company expects three year operating cash flow by FY 3/2028 to be around 1.3 trillion Japanese yen. The company expects to use 680 billion yen in capital expenditures, 220 billion yen in strategic investments, and 400 billion yen to return to shareholders. The capital expenditure is to expand and reinforce production capacity to meet fields such as capacitors and strengthen the global supply chain. The strategic investments are mainly for M&A and other growth investments.

Exhibit 10 Murata Core and Growth Products



Source: Murata

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Kokusai Electric (6525.T – JPY 2,103- TSE) 3D Architecture Opportunities

COMPANY OVERVIEW

Headquartered in Chiyoda, Tokyo Kokusai Electric is a Japanese semiconductor manufacturing equipment company founded in 1949. The company specializes in batch atomic layer deposition (ALD) systems which are advanced thin-film deposition technique that allows deposition of several dozen wafers at once. Deposition is the process of adding thin layers onto a silicon wafer and as semiconductors become smaller and more complex, a more precise deposition is necessary for performance and reliability of the semiconductor. Kokusai Electric's equipment is used in Logic/Foundry, DRAM, NAND, and SiC Power Devices market. The company expects 238 billion yen of sales and operating profit of 50.2 billion yen in FY 3/2025. The company has 232 million shares outstanding, closed at 2,103 yen per share, market cap of 500 billion yen, net debt of 27 billion yen, for total enterprise value of 527 billion yen.

Reason For Comment

Market leadership: 70% global market share in Batch ALD and management's conviction that batch ALD is the winning technology for next-gen semiconductor transition

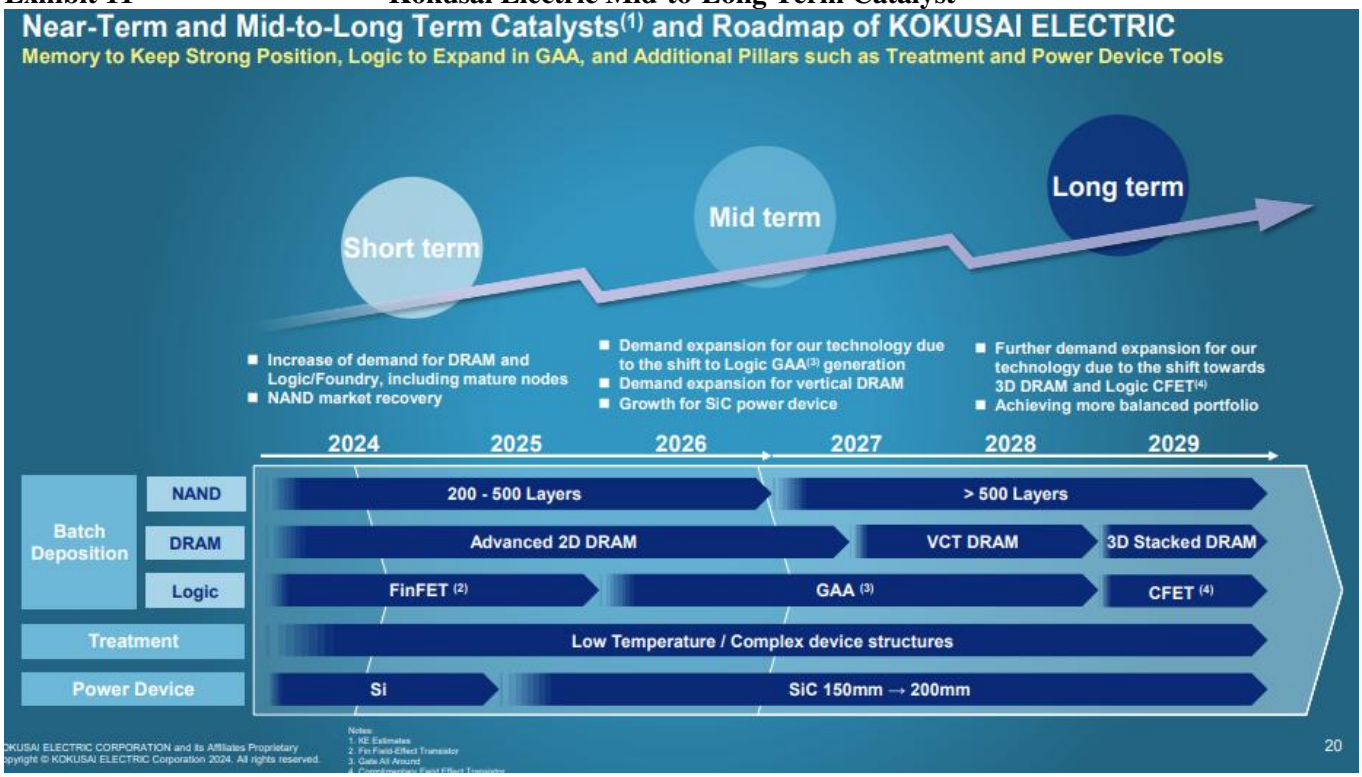
We had a meeting with Kokusai Electric's CEO Fumiyuki Kanai, and Investor Relations Takaaki Nose. The company is betting that its investment in its Batch ALD will be the new de-facto method of the major transition of semiconductor 3D architecture.

- **Batch ALD Market**
  - Kokusai Electric has a 70% market share in Batch ALD mainly competing against Tokyo Electron and is predominantly a two player market.
  - Batch ALD is a growing, higher value product in the semiconductor manufacturing industry. The company expects that whenever there is a generation transition, the manufacturers will make investments in dep and etch which will directly benefit Kokusai Electric. Kokusai Electric believes the tailwinds from generation transition to 3D structures will last until 2030. The generation transition will increase the number of layers thus needing more deposition steps which means higher need and use of Kokusai Electric's equipment.

- **Major Applications**
  - Logic/Foundry: The most advanced semiconductors are investing aggressively into next gen architecture like Gate-All-Around (GAA). This investment should be incrementally positive for Kokusai Electric as its batch ALD equipment is a direct beneficiary. Although that is the case, the overall market in logic/foundry is mixed. There are only three major end customers in this market, TSMC, Intel, and Samsung. The problem is that Intel and Samsung are both struggling with their semiconductor manufacturing business, which has forced both to curb down on capital expenditures. TSMC on the other hand is strong but there is a worry that one player being stronger in the market means that TSMC can exert pricing leverage towards the equipment players.
  - DRAM: High bandwidth memory (HBM) related investments are strong. HBMs are prominently used for data center GPUs. Like logic/foundry, DRAM has three main players in Micron Technology, SK Hynix, and Samsung. Currently Kokusai Electric sells a similar range to all three companies right now going from around 6 billion to 10 billion yen each this fiscal year. But the company affirmed that shipments to Micron were the largest among the buyers of Kokusai's equipment.
  - NAND: Sales to NAND-related applications have been weak. The ASP here has been deteriorating, and customers have lowered projections. The company expects growth here next FY as the compares are easy.

- **Geopolitical Concerns**
  - Like other semiconductor equipment companies, Kokusai Electric has high sales ratio of 40-50% of total sales to the Chinese market. The Chinese market has been strong for semiconductor equipment as they have been potentially over-buying ahead of export restrictions. Kokusai Electric expects Chinese investment to stabilize and back down from the elevated levels of the past two years.
  - On export restrictions, Kokusai Electric's equipment for now is out of the U.S. export regulations. The company explained that even if some customers are on the entity list, it can still legally export to those customers. Though some equipment now will need license approval to be shipped to specific customers in China.

Exhibit 11 Kokusai Electric Mid-to-Long Term Catalyst



Source: Kokusai Electric

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Disco (6146.T – JPY 27,470 - TSE) Smaller Nodes Favor #1 Wafer Dicer & Grinder

COMPANY OVERVIEW

Headquartered in Tokyo, Japan, Disco Corporation is a semiconductor manufacturing equipment company. The company specializes in grinders, dicing saws, laser saws, and polishers. Dicers are mainly used for cutting wafer silicon into separate individual chips and grinders are used to refine the wafers to precise specifications. The company expects FY3/25 net sales of 373 billion yen, up 21% YoY, and operating income of 152.8 billion yen, up 26% YoY. The company has 108 million shares outstanding, closed at 27,470 yen per share, market cap of 2.9 trillion yen, net cash of 263.5 billion yen, total enterprise value of 2.7 trillion yen.

Reason For Comment

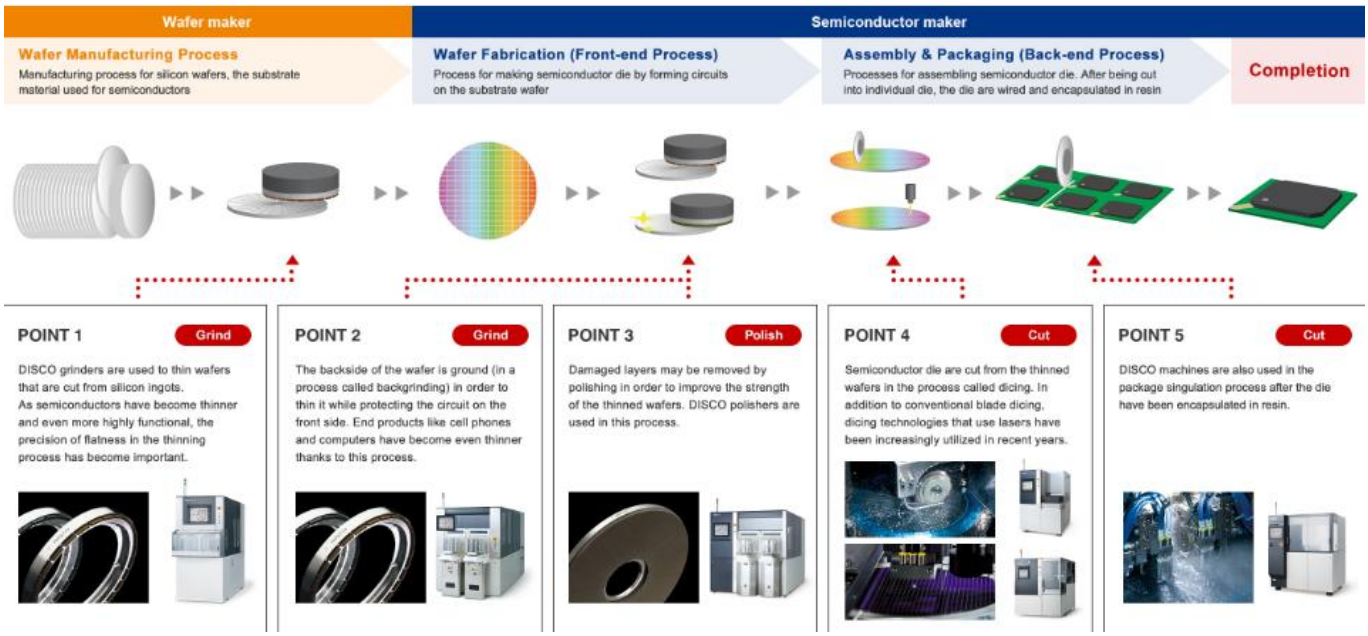
Market leadership: The leader in semiconductor wafer dicer/grinder with global market share of 70-80% and 100% market share in the High Bandwidth Memory used widely in AI

We had a group meeting with Disco Corporation's Investor Relations, Hiroyuki Suzuki, Ryuichiro Koba, Yurika Nakai, Satsuki Sugiuchi, and Fumika Kawaguchi, at the Daiwa Conference. Management expects positive top line growth will resume in 2026.

- **Dicers/Grinders Market Situation: Expect Further Growth in 2026**
  - Disco Corp. has 70-80% market share of the entire dicer/grinder market. The company's largest competitor is Tokyo Seimitsu. In the High Bandwidth Memory (HBM) market, the company has 100% market share and Tokyo Seimitsu doesn't seem to be making inroads in this market. Tokyo Seimitsu is trying to enter the market with the next-gen HBM, but that is a difficult proposition.
  - Gen AI related investments are strong as expected. On the other hand, non-AI related semiconductors investments have been weak, and we should not expect a simple increase in production due to increase in demand because of the inventory situation.
  - Disco Corp. expects HBM demand to be lower in 2025 compared to 2024. On the other hand, demand for logic and packaging should increase, which will offset the decline in HBM.

- **Capital Allocation: Organic Investment for Long-Term Capacity**
  - Organic investments to be the main priority. Capex to go towards an increase in production capacity. The company will try to build out capacity in anticipation of demand increase but it takes a lengthy amount of time to obtain land and facilities but installing equipment can be done quick. Currently, the company seems to be satisfied with its production capacity and has no intention to increase capacity rapidly in the near-term.

Exhibit 12 **Disco's Dominance in the Wafer Fabrication Process**



Source: Disco

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Macnica (3132.T – JPY 1,761 - TSE) Market Recovery by Year End & Cybersecurity

COMPANY OVERVIEW

Headquartered in Shin-Yokohama, Japan, Macnica is a value-add semiconductor and network distributor. The semiconductor business sells integrated circuits and electronic devices mainly in the industrial and automotive segments. Macnica also is a beneficiary of heightened demand from Nvidia GPU chips as it sells those datacenter GPU chips. The company also operates in the networking segment selling networking hardware, software, and services. The company is trying to grow its networking segment which has higher margins than the semiconductor segment. Macnica has 61 million s/o, shares priced at 1,761 yen, market cap of 315.4 billion yen, net debt of 34.5 billion yen, minority interest of 9.5 billion yen, TEV of 359.4 billion yen.

Reason For Comment

Market leadership: #1 semiconductor distributor in Japan and a major global reseller of cybersecurity market leader CrowdStrike in Japan

We visited Macnica's headquarters in Shin-Yokohama, Japan. We had a meeting with Chief Financial Officer Makoto Okawara and Investor Relations Daijiro Mano. We have a positive view on Macnica's strong position as a leading distributor of semiconductor products and cyber security solutions in Japan and diversified markets and offerings. Management highlighted its success of cultivating its distributor position for Renesas. Macnica forecasts the anticipated semiconductor market recovery may take place starting in the fourth quarter of 2025. Cyber Security remains the top major growth driver and carries the highest gross margin.

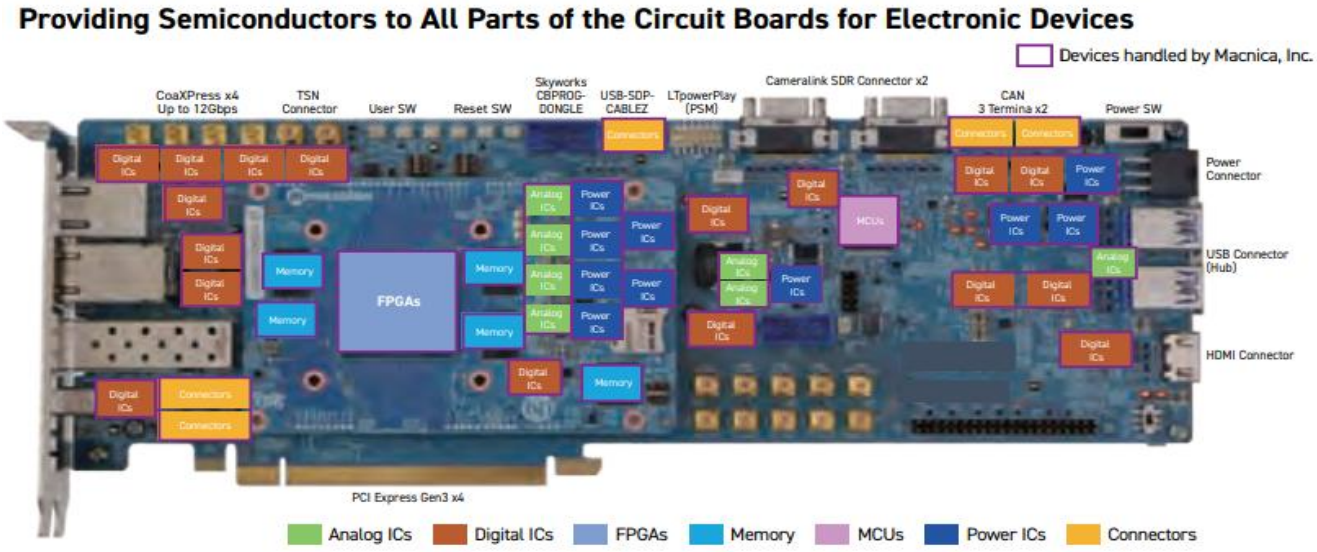
- **Semiconductor Business: Expect market recovery in the fourth quarter of calendar year 2025. CFO anticipates the minimal impact of potential tariffs.**
  - The company has a major exposure to auto and industrial segment of the semiconductor business which both have been experiencing cyclical downturns. The company expects recovery to start from 2H of the FY 3/26 which means around October or later. The company cautioned that there maybe some lag as many customers still have inventory on their balance sheet. The concern on cyclical recovery is more on the industrial side as Macnica believes the automotive business is performing relatively well.
  - Tariff impact is difficult to tell for Macnica but the CFO believes the impact to the company will be minimal. The reason is that Macnica doesn't sell directly to the U.S. but instead U.S. companies use Macnica to distribute to the Asian countries. Additionally, Macnica doesn't have any fixed manufacturing plants which is a positive against potential tariffs. But recent retaliatory tariffs by China can dent certain analog demand for Macnica.
  - Macnica has a diversified set of customers in the semiconductor segment. Macnica's top 8 customers are Analog Devices, Renesas, Infineon, Intel's Altera, OnSemi, Broadcom, Texas Instruments, and Micron Technology. Sales of Analog Devices products account for ~20% of its total sales.
  - In AI infrastructure, Macnica sees opportunity in selling servers to enterprises in Japan.

- **Macnica's Semiconductor Industrial Segment: Favorable gross margin and well diversified business**
  - Macnica's industrial end-markets are diversified. Factory Automation is the largest end market in its Industrial segment and accounts for less than 20%. Semiconductor processing equipment is the second largest.
  - For Macnica, Industrial tends to have higher gross margins than automotive segment. Industrial segment's gross margin is at around 10-15% compared to the automotive segment's at around 10%. This is due to industrial segment having higher number of customers compared to automotive which has a more concentrated customer base. Recent earnings from Analog Devices saw unexpected bullishness in the industrial sector for semis, but Macnica toned down the optimism saying that Analog Devices tends to be overly optimistic in earnings calls.

- **Macnica's Semiconductor Automotive Segment**
  - In automotive, Macnica successfully established itself as a distributor of Renesas. Sales of Renesas' product grew from zero to ~15% of Macnica's sales.
  - Management views the current shift from EV to hybrid is favoring Japanese OEMs and presenting opportunity for Macnica.

- **Network Business: High Profitability and Major Growth Driver**
  - The Network business is Macnica's growth area, growing at a double digit percentage. Management believes small-to-mid-enterprise needs stronger security protection.
  - Macnica sees strong growth in endpoint security and has a close relationship with leading vendors such as CrowdStrike. Macnica also serves as a distributor and partner of Splunk, Box, Trellix, Talus Solutions, and CyberArk.
  - The operating profit margin on this business is ~8%, higher compared to semiconductor business's operating profit margin of ~4%.
  - Weak yen is typically negative for Network. The company will buy the product in USD and sell in JPY. It takes months to finalize and commit on a deal and thus volatility of FX can impact the business negatively, if the yen weakens during the time gap between getting the product and deal being signed.
  - Macnica is the #1 distributor for Nvidia in Japan. Manica mainly sells servers to hyperscalers and system integrators. The main customer here will be Softbank.

Exhibit 13 **Semiconductor Parts Distributed by Macnica**



Source: Macnica

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Ulvac (6728.T – JPY 4,280 - TSE) Opportunities in Advanced Packaging

COMPANY OVERVIEW

Headquartered in Kanagawa, Japan, Ulvac is multinational corporation specializing in vacuum equipment and related products. The company operates in various industries, including electronics, semiconductor, manufacturing, and healthcare. The company's emphasis is on the semiconductor segment where the company sees opportunities in advanced logic/foundry, memory, and packaging. Other business categories mainly include battery-related and flat panel display-related businesses. The company expects net sales of 275 billion yen, up 5% YoY, and operating profit of 34.5 billion yen, up 16% YoY, in FY 6/25. The company has 49 million shares outstanding, closed at 4,280 yen, market cap of 211.2 billion yen, net cash of 43 billion yen, minority interest of 7.3 billion yen, for total enterprise value of 175.5 billion yen.

Reason For Comment

Market leadership: A global leader in specialty vacuum processing technology

We had a group meeting with Ulvac's CEO, Satsuo Iwashita, and IR, Daichi Harada and Satoshi Umemoto, at the SMBC Nikko Conference. Ulvac has multiple growth opportunities to win shares across multiple areas within Metal Hard Mask and advanced packaging solutions.

- **Semiconductor-related Equipment: Opportunities in Advanced Packaging**
  - Ulvac's major applications in the semiconductor field include, Metal Hard Mask (MHM) manufacturing, sputtering equipment, deposition and etch related equipment, and ion implantation.
  - Ulvac entered the MHM market in 2018. MHM consists of metal films such as titanium nitride to insulate film processing of wafers and is a crucial component in the fabrication of logic semiconductors. Ulvac's MHM technology is adopted by 4 customers and the company is typically the secondary vendor to larger companies such as Applied Materials (AMAT). Ulvac's CEO explained that many large customers typically want a two vendor system for any type of processes, however, getting designed in to a system is difficult given the necessary tests that have to be undertaken. Although Ulvac's competitor, AMAT, is significantly larger, Ulvac can compete as it is a specialist rather than a generalist like AMAT.
  - Ulvac has strength in Ion Implantation equipment. The company has high market share of Ion Implantation equipment in China and believes that it can cross-sell sputtering equipment and ion-implantation equipment to Chinese customers. The company generally competes against Axcelis Technology (ACLS) in the Chinese market but Ulvac's first to market allowed Ulvac to gain significant market share. Ulvac's strength in the Chinese market comes from local maintenance capability and the CEO believes that Ulvac not being an American company also help as well given the tensions between the U.S. and China. The upgrade cycle for Ion Implantation equipment is for when companies upgrade to 8in wafers.
  - Advanced packaging is a high growth area for Ulvac. The company expects packaging business to 4x by FY 6/30 compared to the front-end expanding by 2.5x. The company's main customer in packaging is TSMC and with the expansion of Chips on Wafer on Substrate (CoWoS) from TSMC which is a packaging technique used in Nvidia GPUs. Ulvac has descum processing equipment which is a plasma based technology to remove residues out of interposers. This is a necessary step in 3D Packaging/CoWoS.

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Hon Hai Precision Industry (2317.TW – 134 TWD - Taiwan) Growth of AI Servers

COMPANY OVERVIEW

Headquartered in New Taipei City, Taiwan, Foxconn Technologies or Hon Hai Precision Group is a Taiwanese contract manufacturer of electronics. The company is famous for producing electronic brands for major electronic markers such as Apple and Microsoft. In recent years, the company has been manufacturing Nvidia's AI servers and EVs. The company generated NT$6.86 trillion ($216 billion) in sales, up 11.3% YoY, and operating income of NT$200.6 billion, up 20.5% YoY. Hon Hai has 13.9 billion shares outstanding, closed at NT$134, market cap of NT$1.9 trillion, net debt of NT$77.31 billion, equity investments of NT$203 billion, minority Interest of NT$201.4 billion, total enterprise value of NT$1.98 trillion.

Reason For Comment

Market leadership: #1 electronic contract manufacturer, #1 Apple iPhone assembler, a rising incumbent top player in AI servers

We participated in a group meeting with Hon Hai's IR, James Wu and Kristen Fang, at the Daiwa Conference. The company highlighted optimism in AI servers being its new major growth driver. Hon Hai is optimistic that it can deliver strong top line growth in 2025. We believe Hon Hai has a strong position, scale, and operating leverage to emerge as a major AI server contract manufacturer and establish market dominance. In automotive, we believe Hon Hai will enter the international market outside of China in a careful and measured approach.

- **Market Leader**
  - Hon Hai's competitive advantages are massive manufacturing scale and speed, strong long-standing customer relationships, and large purchasing power of components, and factory automation. Hon Hai has strong long-standing relationships with Apple, Nvidia, and Microsoft. The company co-develops new products with its customers. For example, every new iteration of Apple products is partially developed by Hon Hai. It stated that co-developing new product can generally lead to more than 50% of procurement shares.
  - Historically, smart consumer electronics account for over 50% of its revenue. The company stated that its cloud and networking is growing so fast that it will account for ~ 40% of its revenue in the future.

- **Geopolitical Uncertainty: Tariff and large manufacturing footprint in China**
  - Obviously, tariffs are the biggest worry for Hon Hai. The company has 70% of its total manufacturing capacity in China, which will be impacted by tariffs. The company explained that for non-US demand, it can still ship from Mexico and Canada.
  - Hon Hai operates based on general cost plus model. Therefore, incremental cost of tariff will be reflected in pricing.
  - For consumer electronics, the company has no capacity in the U.S. and thus has indicated some interest in expanding capacity there.
  - Overall, U.S. tariff situation is creating uncertainty for Hon Hai and it seems quite difficult for Hon Hai to adjust to this situation as changing its supply chain and building new facilities cannot be done overnight.

- **The AI Story: Bullish on the growth of AI servers**
  - Hon Hai manufactures AI server racks for OEMs, ODMs, and Hyperscalers. The company expects AI-related revenues to surpass smart consumer electronics (smartphones) revenue in the near-term. The Server revenue is up 78% in the nine months ending 2024 to around NT$1.45 trillion.

- It is difficult for a company to change its contract manufacturer in the near-term, so Hon Hai has high expectations that their leadership in manufacturing AI servers will stay for the next two years.
- Hon Hai believes Nvidia has the strongest position in AI training and therefore, pricing power for the foreseeable future. The company believes that there will be multiple players in AI inferencing.
- In data center infrastructure, customers wants to ensure no interruption. Therefore, Hon Hai has relatively long visibility that spans about two years, longer than its general visibility of 12 months.
- For AI servers, most customers ask for buy and ship. Hon Hai will bear some working capital, around 6-8 weeks of inventory. Hon Hai can charge customers on those working capital. The company expects inventory to increase with Blackwell ramp as Hon Hai needs certain amount of reserves for AI servers.
- On the overall margins, Hon Hai expects AI servers to be slightly margin dilutive. AI server margins are around a single digit compared to corporate average of 6%. The company explained that ~75% of costs come from chip products for AI servers, e.g. High Bandwidth Memory (HBM) and GPU chips. It only has cost control on ~20% of the total costs. On an overall dollar basis, AI servers are accretive to earnings.

- **Consumer Electronics: Smartphone**
  - Manufacturing cost of smartphones is increasingly higher driven by higher content, increasing complexity, and higher labor costs.
  - Hon Hai is optimistic about the upcoming PC refresh cycle. It pointed out that the last market cycle was during the COVID-19 pandemic and the next refresh cycle may take place in 2025-2026.

- **Auto and EVs**
  - Hon Hai's major interest in EVs is manufacturing for the global market. It has no current interest in manufacturing of EVs in China itself. It does have interest in manufacturing Chinese EV cars outside of China, i.e. no interest in manufacturing EVs in China itself.
  - Hon Hai manufactures EVs for Non-Chinese Asian customers such as Mitsubishi and Nissan. The company has a large auto manufacturing plant in Ohio which it bought from General Motors. This Ohio plant can manufacture 300k annually and the company is expecting to increase capacity for its EVs. Hon Hai has limited capacity in Taiwan and has another plant in Thailand which has just started ramping up.
  - Hon Hai estimates that a break-even EV production level is at a monthly production rate of ~10,000 units. It has cost control on ~50% of the total cost.
  - There has been speculation that Hon Hai has been interested in acquiring a stake of Nissan. Hon Hai commented that investing in Nissan isn't a priority but has confirmed that it talked to Renault.

- **Strategic Expansion**
  - Hon Hai will increase its capital investment for two years in a row this year.

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Tokyo Electron (8035.TW – – JPY 19,640 - TSE) Growth Opportunities

COMPANY OVERVIEW

Headquartered in Tokyo, Japan, Tokyo Electron manufactures and sells semiconductor manufacturing equipment (SPE) and flat panel display manufacturing equipment (FPD) to customers worldwide. Tokyo Electron is one of the largest SPE companies in the world primarily competing against KLA, Applied Materials, and Lam Research. Tokyo Electron will be one of the major beneficiaries in multi-year growth opportunities, such as advanced semiconductor packaging, AI and the reshoring/nearshoring of semiconductor manufacturing. Tokyo Electron ADR has 472 million s/o, priced at $136.79, market cap of $64.5 billion, net cash of $2.7 billion, TEV $61.9 billion. We expect the company will earn $4.85 per share on $12.7 billion of revenue and $3.4 billion of EBITDA in FYE 3/31/2025.

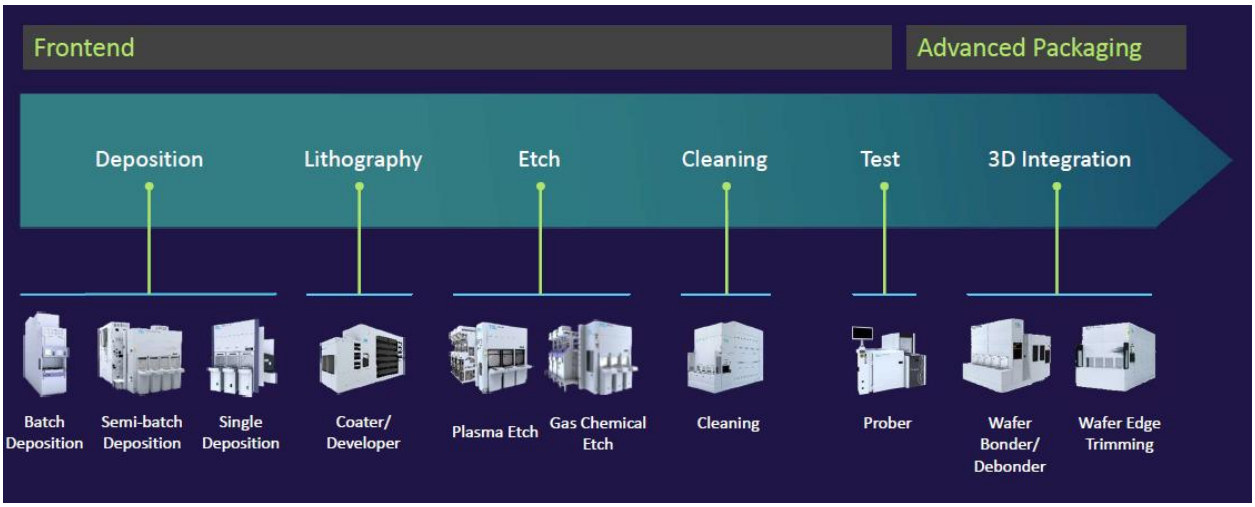
Reason For Comment

Market Leadership: Top #3 semiconductor equipment manufacturer with multiple initiatives to launch new systems and win shares.

We reviewed Tokyo Electron Medium Term Management Plan / Investor Day presentation. Management is optimistic that the company can continue to outgrow its Wafer Fab Equipment market and achieve FY 2027 sales ≥3 trillion yen by leveraging its strengths to address high-growth market areas. It also laid out roadmaps and growth opportunities across logic, DRAM, and NAND manufacturing (Exhibit 14 and Exhibit 15). The roadmaps offer multi-year growth opportunity, on the other hand, they require a lot of material evolution, technological inflection points, and major changes in 3D transistor structure. The main drivers of the roadmaps are AI, first and foremost, and advanced nodes for high-end computing and smartphone markets.

- **Market Outlook and Tokyo Electron**
  - Tokyo Electron has demonstrated growth above its semiconductor capital equipment market.
  - Wafer Fab Equipment (WFE) market has grown 3.1x, from $33 billion in 2014 to $103 billion in 2024. Tokyo Electron has grown its sales 3.9x from 613 billion yen in its FY 2015 to 2,400 billion yen in its FY 2025 and simultaneously boosted its operating profitability.
  - Equipment market growth projection in the next 6 years, 2024-2030
    - WFE CAGR 10%, 1.8x
    - Test/Assembly CAGR 13%, 2.1x

Exhibit 14 Technology Leadership Extend to Advanced Packaging

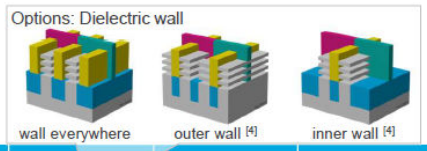


Source: Tokyo Electron

- Tokyo Electron will try to leverage its strengths to address high-growth markets (Exhibit 14). Technology roadmaps across logic, DRAM, and NAND require breakthrough scientific innovation and will lead to high capital investment (Exhibit 15 & Exhibit 16)
  - Leading-edge logic: The semiconductor etch market is expected to grow by 2.7 times, the deposition market by 2.5 times.
  - DRAM memory: The etch market is expected to grow by 2.3 times exceeding the CAGR of WFE

Exhibit 15 **Technology Roadmap Leads to High Capital Investment**

Logic Technology Roadmap (Generic)



[1] Chih-Hao Chang (TSMC) et al., IEDM 2022
[2] Shien-Yang Wu (TSMC) et al., IEDM 2022
[3] Sandy Liao (TSMC) et al., IEDM 2024
[4] Mertens and Horiguchi (imec), EDTM 2024

Source: TEL estimates

Year of HVM (20k/month)	2022~24	2025~2026	2027~28	2029~30	2031~32	2033~34	2035~36	2037~38
Node	3nm	2nm/18A/16A	14A	10A	7A	5A	3A	2A
Transistor	2~1 Fin	GAA NS	GAA NS scaling	GAA NS extension	CFET	2nd Gen. CFET	3rd Gen. CFET	2D material stack (IL/HK, 2D material: TMDC MoS_2, WS_2, $MoSe_2$, WSe_2 etc., IL/HK)
Poly Pitch [nm]	48~45 [1]		45~42		48 [3] ~42	45~39		36
Min. Metal Pitch [nm]	23 [2]		20	18	17	16	14	12
Interconnect booster	Cu Barrier/Seed CIP Backside PDN (HPC)			Cu CIP or Ru subtractive	Ru subtractive AR>3, Airgap	New alloy AR>5, Airgap, BEOL Transistor		
EUV Patterning Technology	EUV MP*1, SE*2			EUV MP, SE High-NA SE		High-NA MP, SE EUV MP, SE		
Resist	CAR*3			CAR (+MOR*4)	CAR+MOR			

*1 MP: Multi-Patterning, *2 SE: Single-Exposure, *3 CAR: Chemically Amplified Resist, *4 MOR: Metal Oxide Resist

DRAM Technology Roadmap (Generic)

Source: TEL estimates

Year of HVM (20k/month)	2023-24	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Node	1b	1c	1d	0a		0b		0c	0d	0e		
Cell layout / Structure	2D: 6F²			4F² VCT* [1,2]					3D			
F [nm] in 6F²	13~12.5	12~11	10	9		8		7	(3D ~1xxL)		(3D >1yyL)	
Cap. pitch [nm]	39~37.5	36~33	30	27		24		21				
Cap. A.R.	>50	>55	>65	>70		>75		>80				
Cap. Mat.	ZrAlHfO					Alternative (HfZrO Anti Ferro. etc)						
WL	TiN					Low R metal						
Peri. CMOS	HKMG (Poly-Si, nMOS, HKMG, pMOS)			Bonding					FinFET			
HBM	HBM3E (8/12Hi,24/36GB)		HBM4 (12/16Hi,36/48GB)		HBM4E (16Hi,64GB)		HBM5 (16,20Hi, 64/80GB)		HBM5E		HBM6	

* Vertical Channel Transistor
[1] Seokhan Park (Samsung) et al., IEDM 2023
[2] Daewon Ha (Samsung) et al., IEDM 2023

Source: Tokyo Electron

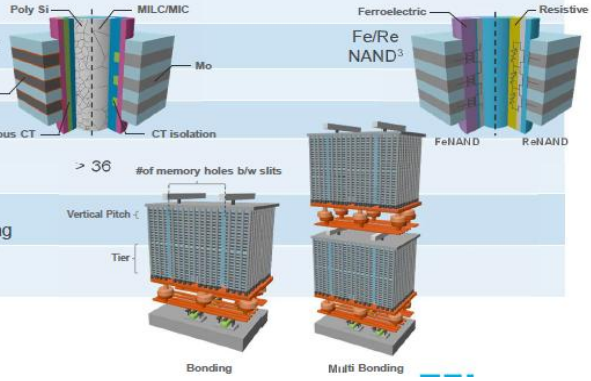
Exhibit 16 Technology Roadmap Leads to High Capital Investment (Continued)

NAND Technology Roadmap (Generic)

Source: TEL estimates

Year of HVM (20k/month)	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Stack (~1.3x/1.5years)	3xxL		4xxL	5xxL		7xxL	1xxxL		*1yyyL	*1zzzL		*2xxxL
Tier	2 or 3		3 or 4	3 or 4		3 - 5	4 - 6		5 - 7	6 - 8		7 - 10
Vertical pitch [nm]	39 - 45		38 - 43	38 - 42		37 - 41	36 - 40		35 - 39	34 - 38		33 - 37
Memory height [μm]	12 - 14		15 - 19	18 - 27		24 - 36	34 - 45		45 - 62	57 - 74		70 - 84
Charge trap (CT)	Continuous CT					CT isolation				Fe/Re NAND[3]		
Channel	Poly Si grain CIP			MILC[1]/MIC[2]								
WL metal	W or Mo		Mo									
#holes btw. Slits	14 - 20		19 - 25	24 - 32		30 – 36	> 36					
Layout/Structure	Under array or Bonding		Bonding			Bonding or Multi Bonding						
Peri. CMOS	Poly Si Gate					HKMG						

* Trend Extrapolation
[1] Metal induced lateral crystallization, N. Ishihara (Kioxia) et al., VLSI 2023
[2] Metal induced crystallization
[3] Jeehoon Han (Samsung) et al., IEDM 2023



Source: Tokyo Electron

- **Long-term Financial Target**
  - Management is targeting FY 2027 sales ≥3 trillion yen, operating margin ≥35% and ROE ≥30%. Gross margin expansion opportunities are more high value-added product offerings and increased production efficiency.
  - Tokyo Electron is planning to invest 700 billion yen from FY 2025 to FY 2029, including a new facility in Miyagi scheduled to complete in Summer 2027.
- **China**
  - Tokyo Electron believes China accounts for about 35% of the WFE market in calendar year 2025 and will remain at 30%-35% in the mid-to-long term. It expects China will lower its investment in leading-edge area and stabilize its mass production.
- **Advanced Packaging and Innovation**
  - Tokyo Electron's strength in advanced packaging is its combination of plasma technology and cleaning technology. It has delivered equipment for CMOS image sensos and High Bandwidth Memory. It is currently working on 3D NAND, logic BSPDN, and new applications.
  - Wafer bonders: Wafer-to-wafer and Die-to-wafer bonding is a growth opportunity the assembly of advanced packaging. Tokyo Electron has a market share of 20% of the total addressable market. It is focusing on front-end processes. In the backend process, the company believes advanced packaging, e.g. die level packaging, will drive market growth in the next 5-10 years and it will aim to expand its business in the back end packaging as well.
  - Atomic Layer Deposition in major semiconductor deposition
    - Tokyo Electron offers batch ALD and space-divided semi-batch ALD. Atomic Layer Deposition is replacing some conventional CVD processes. Areas of interest are batch deposition and high-temperature processes that increase film quality.
  - Tokyo Electron has strong etch technology, including both conductor etch and dielectric etch. Management acknowledges that there are times when Tokyo Electron delivered sub-par execution in timing and delivery of development prototypes for customers and their evaluations.
- **Financials**
  - Gross margin: Advanced packaging equipment carries similar gross margin compared to general front-end equipment.

Important Disclosures

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