

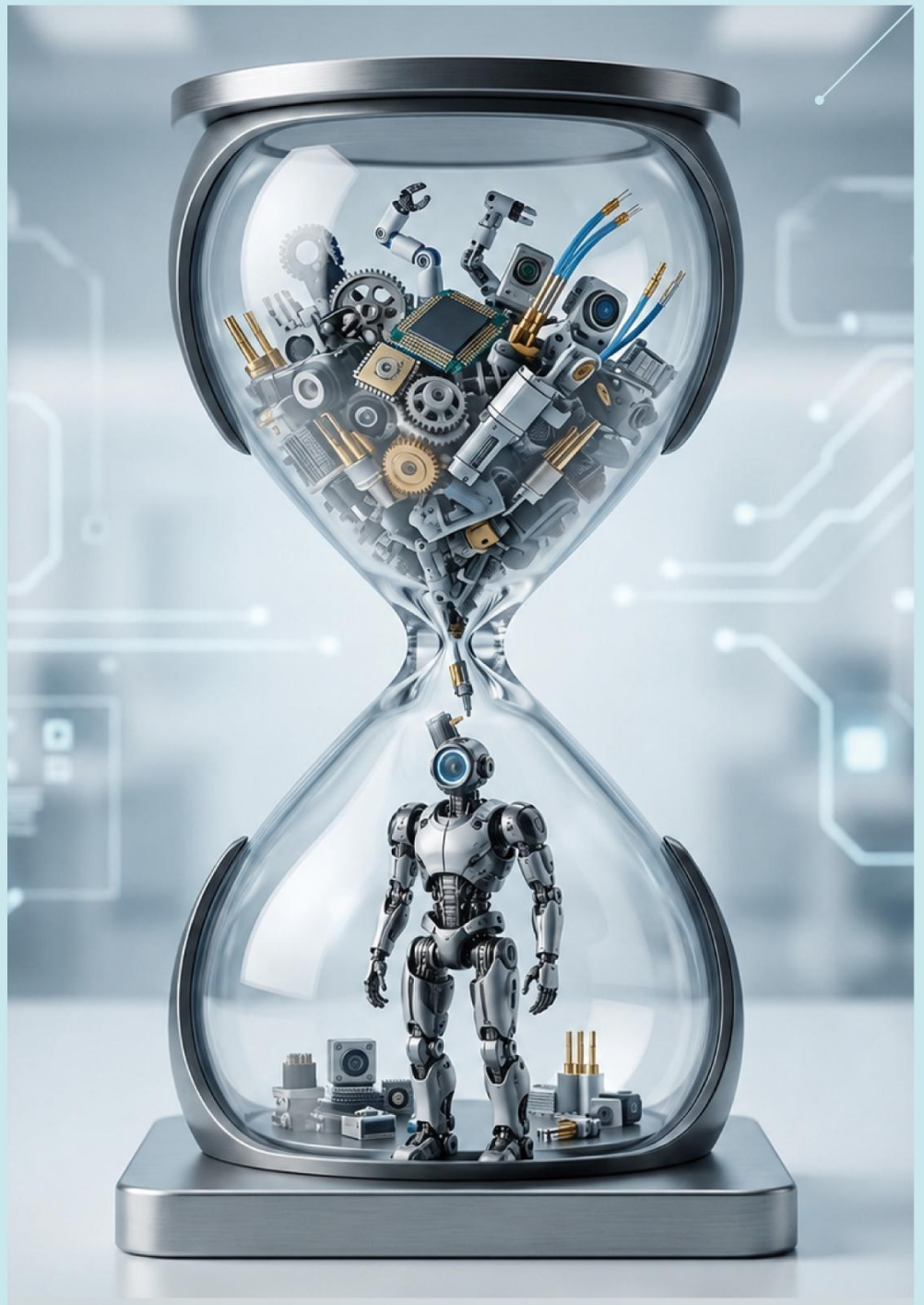
SECTOR UPDATE

2026. 6. 2

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Samsung Securities

Autos (OVERWEIGHT)

2H outlook: The next bottleneck

WHY SHOULD YOU READ THIS REPORT

Dear investor,

Since May, the auto sector has seen a renewed stock-market rally, led by Hyundai Motor (HMC) and Hyundai Mobis. The catalysts were: 1) the unveiling in early May of Boston Dynamics' Atlas production model; and 2) growing expectations surrounding Boston Dynamics' IPO. However, their production and IPO roadmaps have not materially changed from the timelines announced at CES 2026 (mass production [30,000 units *pa*] in 2028 and an IPO around 2028) and are still two years away.

We believe there was another, more important catalyst—*ie*, Toyota announced a 4QFY25 (fiscal year ends in March) earnings shock the same week. Toyota's 4QFY25 operating profit fell 45% y-y, significantly missing consensus. Its FY27 operating profit guidance was revised down 20% (for an operating margin of 5.9%), signaling the weakest profitability in nearly two decades. Toyota has been the global leader in both sales volume and profitability for the past 20 years, anchored by its hybrid technology. Its earnings weakness points to a winding down of the internal combustion engine era.

The equity market is already pricing in the transition to the physical AI era. An oligopoly in the physical AI market is expected to emerge, with 2 or 3 players dominating in the West and 2 or 3 players in China. Our forecast stems from the massive capital required for technological development, which only a few firms can afford. True monopolies seem unlikely given the inherent constraints of hardware industries (such as supply-chain bottlenecks and production limitations).

The most critical condition for becoming an oligopolist in this era is possessing substantial financial strength. HMC/Kia are uniquely positioned to generate massive volumes of robot behavioral data—the key bottleneck in robotic AI models. Before scaling robot production, they are expected to monetize their data assets to fund their physical AI initiatives. The critical link in this strategy is Robot Metaplant Application Center (RMAC; HMG's robot training center), which is scheduled to be launched in August. The higher HMG's market valuation rises, the easier it should be for its future data and robotics joint ventures to command a premium. As capital and talent converge, HMC/Kia are poised to accelerate their rise as dominant players in the physical AI era.

Currently, the key bottleneck in robot hardware is thermal management, not dexterous hands. Humanoid robots generate heat primarily from actuators, which are located in each joint. While the heat generated per actuator is limited, heat accumulates continuously during its operations (24/7). Given the tight space and weight constraints of robots, traditional liquid cooling systems—like those used in EVs—are not feasible. Effective thermal management in robots relies on air-cooling designs, advanced materials, and optimized actuator and capacitor performance. Hyundai Mobis, through its actuator technology, is positioned to lead in this area, driving a valuation re-rating.

We put forward HMC and Hyundai Mobis as our top picks for 2H, given their strategic positioning at the critical bottleneck of the physical AI transition.

Thank you.

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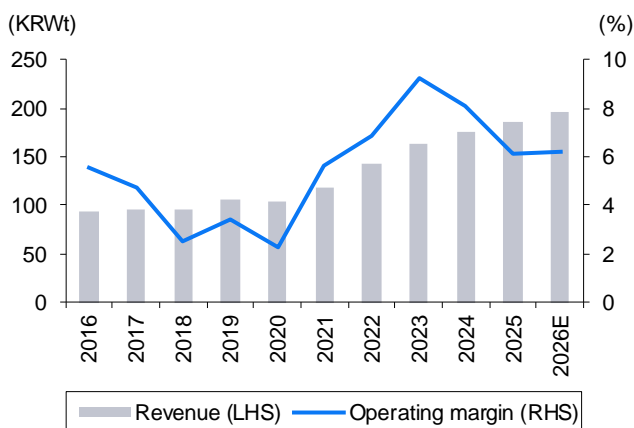
Why are shares rising despite weak earnings?

HMC announces disappointing 1Q results

After peaking in late February with the announcement of a KRW9t investment in Saemangeum, the auto sector's stock performance stalled for two months before rallying again from May. The rally's trigger was the unveiling of Boston Dynamics' Atlas production model and growing expectations surrounding Boston Dynamics' IPO. Yet, the production and IPO roadmaps have not materially changed since CES 2026—both the Atlas' mass-production and Boston Dynamics' IPO are set to happen in 2028, which is still two full years away. In the fast-moving stock market, two years is an eternity. HMC's initial production volume target remains unchanged at 30,000 units *pa*.

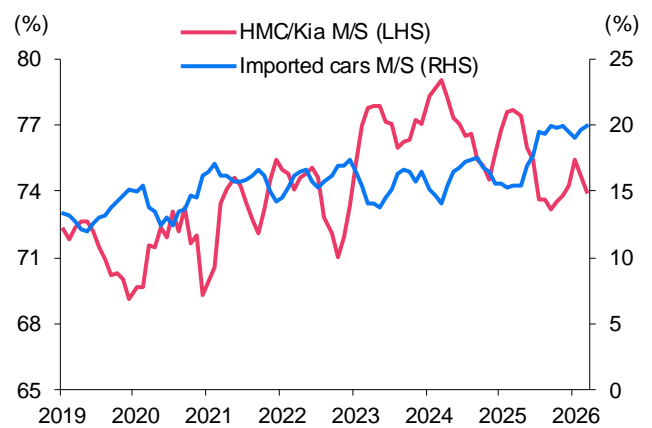
Moreover, HMC's first earnings report after CES 2026 (1Q26) came in weak. Its operating profit fell 30% y-y, missing lowered consensus by 5.7%. Its global sales volume in April also declined 8% y-y, casting doubts over whether its earnings will recover in 2Q. Of note, the firm's domestic sales shrank 20% y-y—hit by engine component supply constraints and a sharp rise in imported vehicle sales—and marked the first time in a quarter that Kia sold more autos domestically.

HMC: Revenue and operating margin



Source: Company data, Samsung Securities

Korean market: HMG vs imported cars' market share



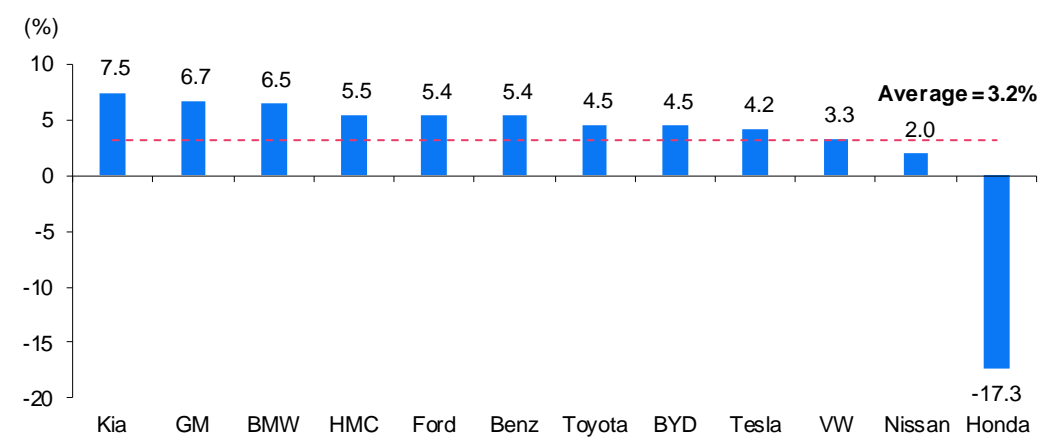
Note: 3-month moving average

Source: MarkLines, Samsung Securities

Even Toyota is coming under pressure

While HMC's 1Q26 results disappointed, they still outperformed many peers'. In 1Q, the global auto industry's average operating margin reached just 3.2%. Honda posted a loss (following a full-year 2025 loss), driven by impairment losses related to the cancellation of some EV projects. Kia maintained the highest profitability among global automakers, while HMC ranked fourth in terms of operating margin.

Global automakers: Operating margin in 1Q26



Source: Bloomberg, Samsung Securities

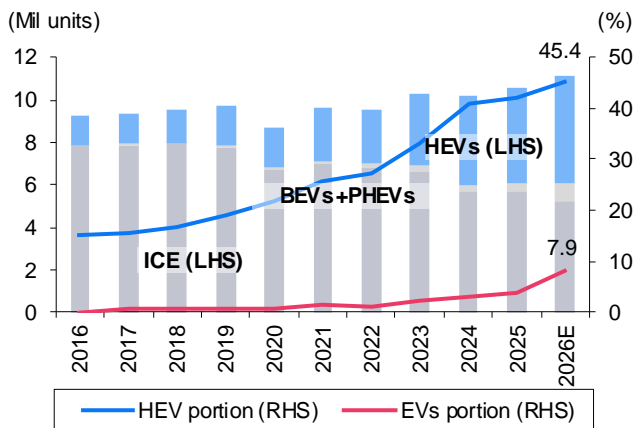
The Korean auto sector's stock rally since early May was not only fueled by Boston Dynamics' Atlas production model announcement but also by Toyota reporting an earnings shock. In the same week Boston Dynamics unveiled the production model of Atlas, Toyota reported its 4QFY25 results (fiscal year ends in March): Operating profit down 49% y-y, missing consensus by 30%. Its operating margin fell to 4.5%, 1%pts below HMC's. The primary causes were a mounting US tariff burden and rising raw-material costs.

Toyota's FY27 guidance further darkens the outlook: While its sales volume and sales (JPY basis) are both expected to remain flat y-y at 11m units and JPY51t, respectively, its operating profit is set to drop 20% to JPY3t, for an operating margin of just 5.9%. Its operating profit is set to be the lowest since 2011 (when the company posted losses following the Fukushima Earthquake amid global recalls) due to persistent US tariff pressure (JPY1.38t, equivalent to 2.7%pts of its total sales) and rising material costs (JPY1.1t, equivalent to 2.1%pts of its total sales).

Toyota, despite a market cap roughly one-fifth of Tesla's, has been the world's top-selling automaker for nearly two decades (since 2007). It built its reputation on hybrid technology and unmatched quality, consistently maintaining operating margins of 8-12%. Toyota has long argued that EVs—due to long charging times and limited range—are impractical for mass adoption, doubling down on hybrids instead. In the US, where half of its global operating profit is generated, hybrid demand is rising, and global hybrid sales now account for 45% of Toyota's total volume. Yet, by projecting its lowest profitability in 15 years, Toyota has signaled that even its core hybrid business can no longer offset the pressures of tariffs and commodity inflation. The internal combustion engine era is clearly winding down.

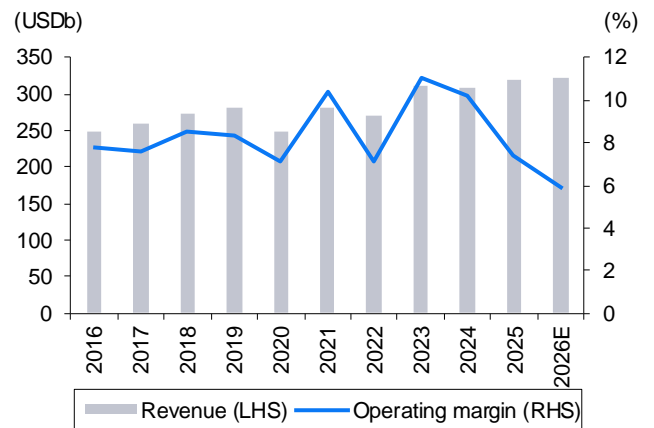
During its 4QFY25 earnings presentation, Toyota unveiled a long-term vision to raise its ROE from 10% to 20% through robotics and software-defined vehicle (SDV) technologies. But investors remain skeptical—already late to joining the EV transition (which began in earnest during the pandemic), Toyota faces skepticism from investors regarding its ability to successfully transition to new technologies. Since peaking at JPY3,825 in late Feb 2026, Toyota’s stock has lost more than 20%.

Toyota: Global sales volume and portion of HEV/EVs



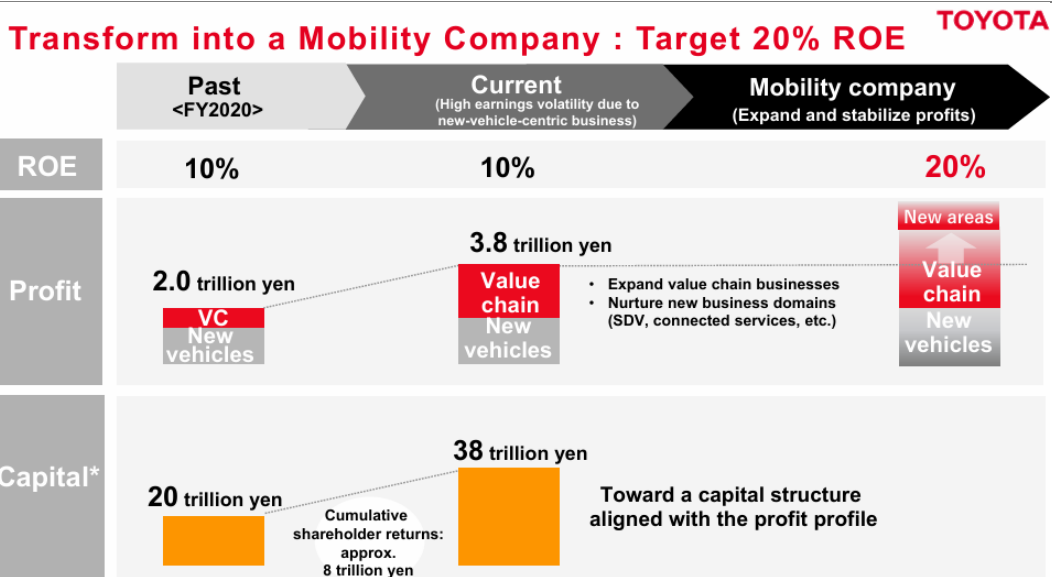
Source: Company data, Samsung Securities

Toyota: Revenue and operating margin



Source: Company data, Samsung Securities

Toyota: Vision for business expansion and profitability growth through SDVs and robotics



Source: Company data

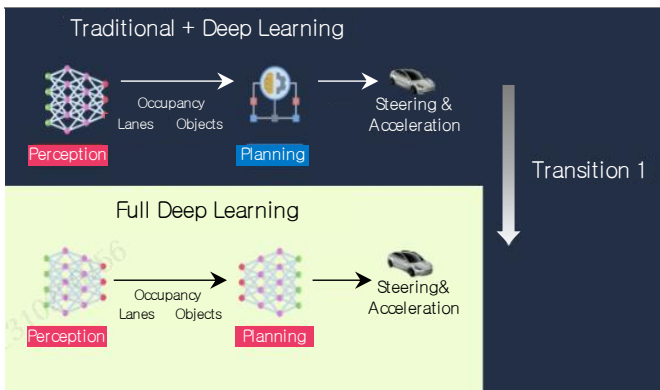
Second EV wave: Sealing the fate of legacy automakers

The prolonged conflict in the Middle East: 1) has sent oil prices soaring, reigniting a second wave of EV buying; and 2) is expected to accelerate structural realignment across the auto industry and transition towards physical AI. The war, which began in late February and has far outlasted expectations, has pushed up crude to around USD100/barrel. Even in the US—where oil production is robust and fuel is relatively cheap—gasoline prices now exceed USD4/gallon. As the capital markets anticipated, the surge in fuel costs has triggered a resurgence in EV demand—global EV sales turned up in March.

What distinguishes this second EV wave from the first is its deep integration with autonomous driving technology—a trend clearly visible in Tesla’s sales volume trajectory. Tesla’s Full Self-Driving (FSD) feature was launched in Jul 2021 with a one-time purchase option (USD10,000) or a USD199/month subscription. Yet its adoption remains below 5%. Despite numerous viral videos celebrating each update, consumers found the value proposition insufficient.

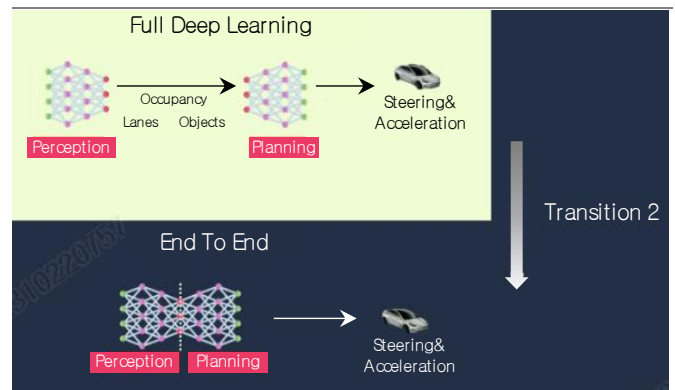
Two major technological leaps have subsequently transformed FSD. The first came in Jul 2023, when Tesla transitioned to end-to-end (E2E) neural network architecture. E2E mimics human cognition: Raw video input from cameras is processed by AI, which brain autonomously adjusts billions of internal parameters (weights) to generate driving logic in real time. The key to this system is massive, high-quality data—Tesla had already equipped each of its EVs with sensors and chips to collect driving data via Shadow Mode, continuously refining its AI without requiring driver intervention.

Tesla in 2022: Perception and path planning as separate AI



Source: Think Autonomous

Tesla in 2023: End-to-end network, a unified stack



Source: Think Autonomous

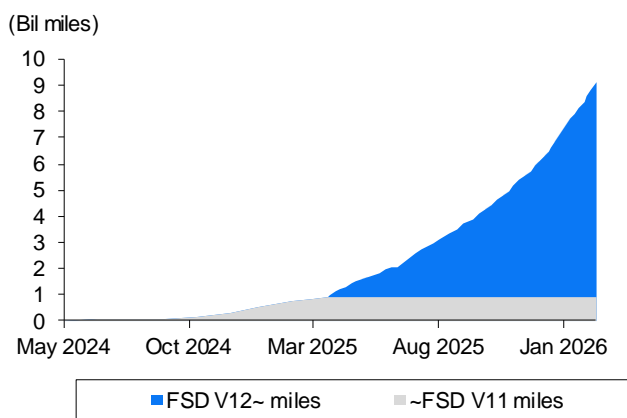
The second breakthrough arrived on Oct 6, 2025 with the rollout of FSD v14.1 on Hardware 4.0 vehicles. Elon Musk called it the second-largest AI evolution since FSD v12—the first full-stack E2E system. FSD v14’s core innovation was a shift from map-centric to vision-centric driving. The neural network’s parameter count surged tenfold—from 1b to 10b (compared to ChatGPT-4’s estimated 1t)—enabling far more nuanced, human-like interpretation of complex road scenarios.

FSD v14.1 also introduced new features: The Arrival option allows users to set drop-off points anywhere—parking lots, curbsides, garages—not just mapped destinations. A new Sloth driving profile was added to its existing profiles (Chill, Standard, and Hurry). Sloth operates near speed limits with

minimal lane changes—ideal for dense urban areas or cautious passengers, including the elderly. This is not just software: It is the practical integration of consumer vehicles into a future robotaxi ecosystem.

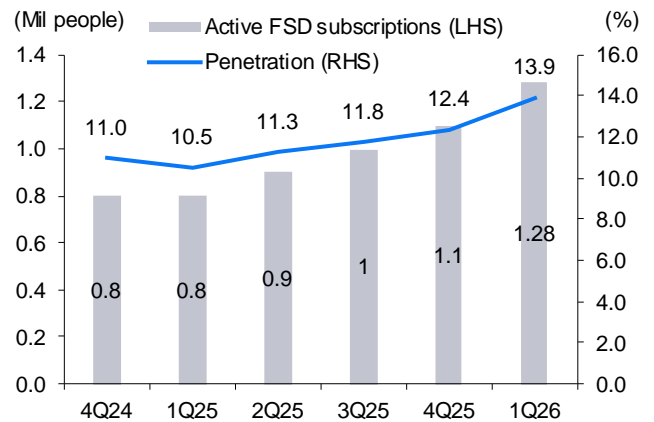
Consumers have reacted swiftly since the FSD v14 rollout. Tesla’s decision to begin disclosing FSD subscription numbers in 4Q25 was no accident. The number of FSD paid subscribers rose from 1.1m in 4Q25 to 1.28m in 1Q26. While the overall FSD penetration (cumulative sales basis) remains at 13%, the figure is estimated at 30-35% in North America. Growing optimism that FSD will be brought to key markets in 2026 has already sparked a recovery in Tesla’s sales volume.

Tesla: FSD cumulative miles



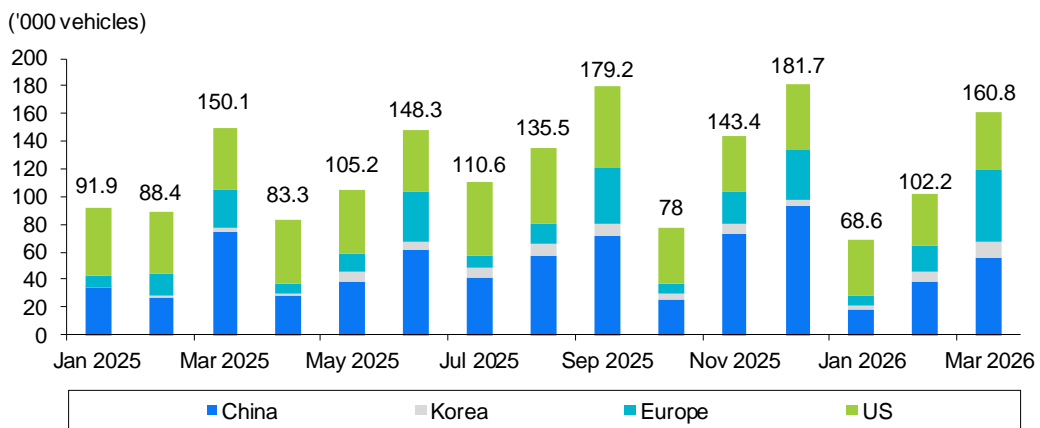
Source: Company data, Samsung Securities

Tesla: Number of active FSD subscriptions



Source: Company data, Samsung Securities

Tesla: Sales volume, by region



Source: CPCA, ACEA, KAIDA, Wards, Samsung Securities

Now with the start of the second EV wave (amid US tariffs, rising raw-material costs, and the fusion of EVs with self-driving technologies), the global auto sector has no choice but to restructure. The sector has seen some profound transformations since the pandemic. Since 2020, automakers globally have announced massive investments in EV production lines and battery JVs. But after two years of chip shortages, they were forced to cut production, though they enjoyed a brief profitability boom thanks to price hikes. Then, rising interest rates dampened auto demand, with EVs (which are still more

expensive than ICE vehicles) bearing the brunt. In 2025, Trump-era tariffs hit, causing profitability to decline further than during the pandemic for nearly all automakers, except Toyota and HMG.

In 4Q25, US, Japanese, and European automakers began restructuring to address deteriorating margins and weak US EV demand—eg: 1) GM converted an EV plant back to an ICE production plant and sold one battery facility to LG Energy Solution; and 2) VW launched major cuts at its software subsidiary Cariad, and canceled EV projects for Porsche and Audi. Meanwhile, rising oil prices—driven by the conflict in the Middle East—have reignited interest in EVs, sparking the second EV wave.

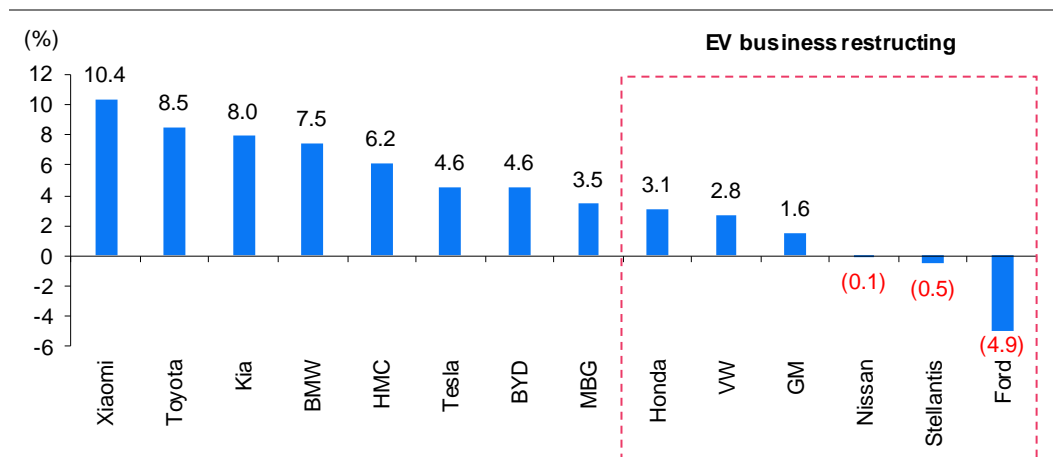
Against this backdrop, the companies that embarked on restructuring at end-2025 are trapped. They cannot reverse course in a single quarter (eg, increasing EV investments). Even if they could, competing directly with Chinese EV makers and Tesla would be nearly impossible. Automakers that retreated from EVs, focusing only on the US market, are now at risk of becoming obsolete. ICE demand is destined to fall, EVs are rolling computers (not just ‘cars powered by electricity’), and production lines are being transformed into smart, robotic ‘dark factories’, minimizing human intervention.

Global automakers: One-time costs related to EVs recognized in 4Q25

Company	Amount	Accounting treatment	Investment cuts & Adjustments
GM	USD7.6b	Contract termination / Restructuring costs	<ul style="list-style-type: none"> Converted Orion plant's dedicated EV production line back to internal combustion engine (ICE) line. Suspended operations in 1Q25 at one of four joint venture (JV) plants with LGES (Ohio site). Converted two plants: One (Tennessee) to ESS production; the other was sold to LGES. The remaining two JV plants were canceled.
Ford	USD19.5b	Impairment losses	<ul style="list-style-type: none"> Asset write-downs and strategic revision under Model e division. Halted production of the electric F-150; wrote off unused EV-specific facilities and software assets. Dissolved JV with SK On: Kentucky plants 1 and 2 retained by Ford; Tennessee plant transferred to SK On.
Stellantis	USD25b	Impairment losses / Restructuring	<ul style="list-style-type: none"> EV inventory clearance and North American business restructuring. Canceled the electric RAM 1500 project. Sold its 49% stake in the LGES JV (initially for ESS production) to LGES for USD100.
VW	USD7.5b	Impairment losses / Restructuring	<ul style="list-style-type: none"> Restructured and abandoned software subsidiary CARIAD (EUR2.2b loss recognized). Reduced investment in battery subsidiary PowerCo and indefinitely postponed its IPO. Delayed or canceled EV projects for Porsche and Audi (EUR5.1b in losses recognized).
Honda	USD15.7b	Impairment losses / Development cancellation	<ul style="list-style-type: none"> Canceled development of three vehicle models in North America and scaled back China operations. Shifted focus back towards hybrid vehicles.

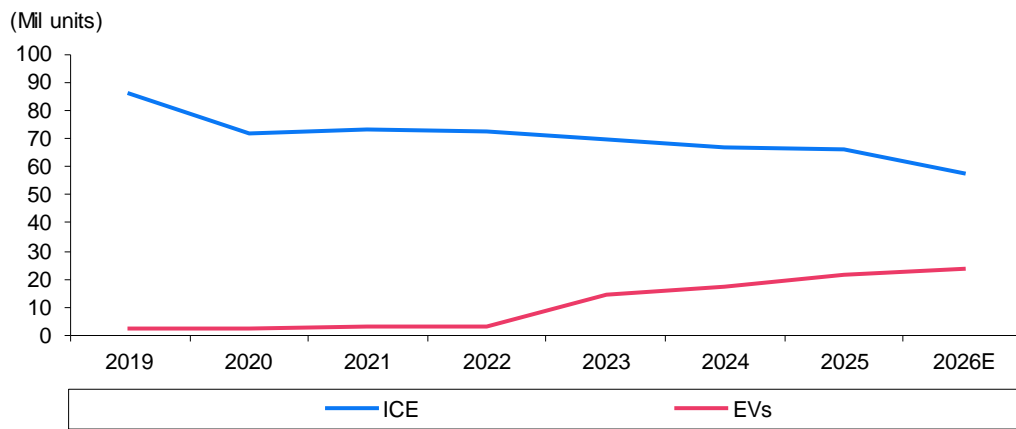
Source: Media, Samsung Securities

Global automakers: Operating margin in 2025



Source: Bloomberg, Samsung Securities

Global auto demand: ICE vs EVs



Source: EV-Volumes, Marklines, Samsung Securities

The shift to physical AI: A new oligopolistic landscape in mobility

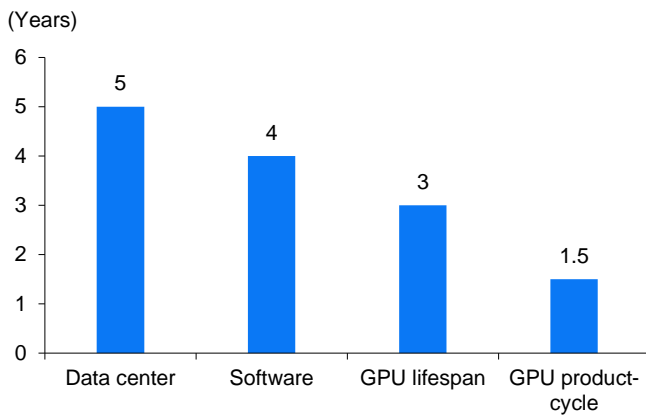
The global auto industry’s structural realignment—amid a technological transition towards physical AI—should usher in a new competitive landscape. Thus far, the auto industry has been protected by governments due to its extensive value chain and high employment impact. While nations tolerated monopolies by their own automakers, foreign companies that gained a dominant position in these markets faced regulatory pushback. This dynamic made the industry a frequent target of geopolitical trade negotiations. The result: A hyper-competitive, low-margin environment where even the leading player had little pricing power. Reflecting this, automakers have historically traded at P/Es of 6-10x—consistently discounted versus other sectors.

With the rise of physical AI, the global mobility landscape is poised to shift to a regional oligopoly. In the West (1 bloc) and China (1 bloc), only 2-3 players are likely to dominate each bloc. Why an oligopoly and not a monopoly? A true monopoly looks impossible given hardware constraints (eg, supply chains, manufacturing capacity, logistics), which constrictions should prevent any single entity from controlling the entire ecosystem. An oligopoly looks to be the most likely outcome—the capital required to develop and deploy physical AI is so immense that only a handful of firms can afford it.

The defining condition for oligopoly leadership is massive financial scale. To build a viable physical AI platform, four pillars are needed: 1) advanced AI models; 2) edge chips (to run AI on vehicles and robots); 3) training data centers (to refine models); and 4) high-quality, massive-scale real-world data.

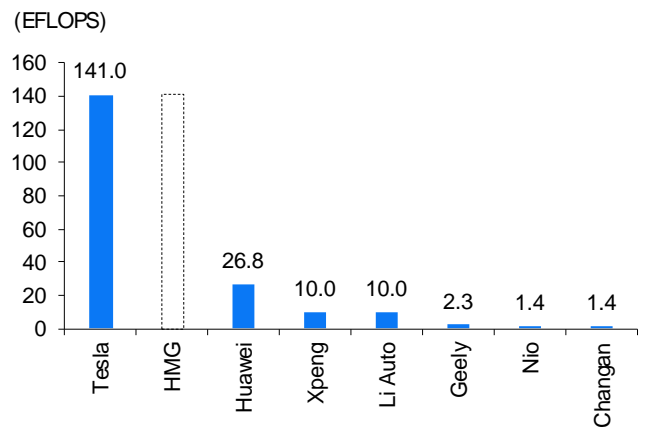
The largest cost is data centers. Building one requires KRW5t-10t, and the AI chips within it must be replaced every 3-5 years to maintain its performance. High-performance chips account for 60-65% of a data center’s capex. Today, only Tesla, Hyundai Motor Group (HMG), and a handful of Chinese EV makers are building such infrastructure.

Data center asset depreciable life



Source: Nvidia, Samsung Securities

Tesla vs Chinese automakers: Computing power

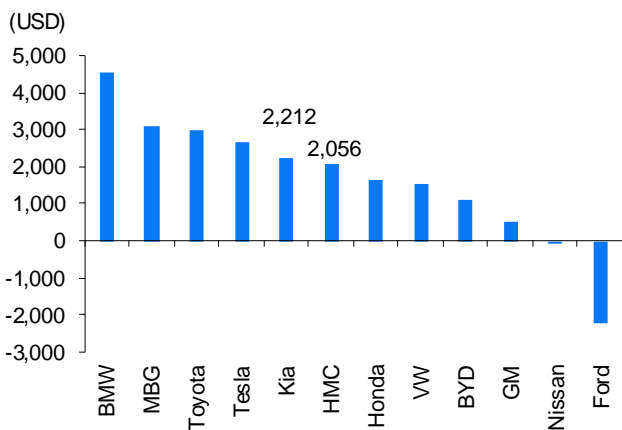


Source: CITIC, Samsung Securities

Accumulating high-quality data incurs enormous operating expenditure (opex). Tesla, for example has since 2019 installed its own chips and sensors in every Tesla EV—regardless of FSD subscription status—to collect real-world driving data via Shadow Mode. In this mode, the car’s AI runs in the background, simulating how it would have driven if fully autonomous. Tesla designs its own chips and uses low-cost vision-only sensors, yet the FSD hardware cost per vehicle is estimated at USD1,100. Adding on Tesla’s R&D costs, the total FSD hardware cost per EV is estimated at roughly USD2,500. With industry-wide operating margins averaging 5% (or USD2,500-3,000 operating profit per vehicle), equipping every car with an FSD system slashes Tesla’s margins by over 50%. Only a few CEOs could have made such a bet.

The same applies to robotics. Both HMG and Tesla plan to deploy early-stage humanoid robots in training centers to collect real-world physical interaction data. These robots, currently priced at USD100,000–120,000 each, offer little commercial utility today. Deploying thousands of them at this juncture should create massive capital pressure for the firms.

Global automakers: Operating profit per vehicle (2025)



Source: Bloomberg, Samsung Securities

Tesla’s FSD: Cost estimates

Category	Details	Amount (USD)	Notes
Hardware	8 cameras	333	Resolution upgraded from 1.2MP to 5MP
	12 ultrasonic sensors	100	
	Hardware 4.0	699	
	Subtotal	1,132	
Development	R&D allocation	1,335	50% of 2024 R&D expense
Data center	Infrastructure	118	Amortized over 5 years for 1.7m autos
Total FSD cost		2,585	

Source: Samsung Securities

Autonomous driving and robotics should evolve into hardware platform businesses (subscription-based with links to many businesses), unlike today’s auto business (which centers on one-time product sales). But unlike digital platforms (eg, YouTube, TikTok), where content is infinitely replicable at near-zero cost and network effects enable winner-takes-all dynamics, hardware platforms should be constrained by physical limits, thus are more likely to settle into regional oligopolies of 2 or 3 well-capitalized players per bloc.

Hardware platforms cannot offer unlimited services because of physical constraints (eg, limitations in terms of supply chains and manufacturing capacity). Due to demand for disparate devices and prices, multiple robot categories should emerge. While hardware platforms lack network effects, they require massive capital investments in real-world data collection and data centers—creating high entry barriers. As a result, rather than one player taking over, it is more likely that two or three capital-rich firms will dominate the market through an oligopoly.

The B2C versus B2B distinction matters. Retail (B2C) tend to consolidate around a single best-in-class platform. Enterprises (B2B), however, tend to avoid vendor lock-ins for risk management. This is why cloud computing is dominated by Google, Amazon, and Microsoft rather than by one firm. Humanoid robots should follow a similar path: After being deployed in industrial settings (B2B), they will likely penetrate homes (B2C). The enterprise-first model makes an oligopoly far more likely than a monopoly.

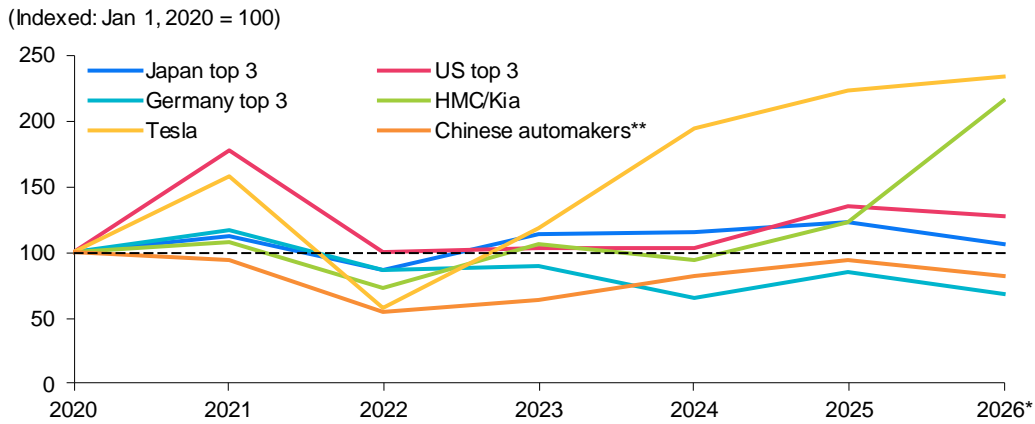
Digital world platform vs physical world hardware platform

Category	Digital World Platform	Physical World Hardware Platform
Industry	SNS, YouTube, LLM	Smartphones, ride-sharing, robotaxis, robots
Technical characteristics	1) Network is the primary asset: Market leadership is critical due to network effects 2) Replication cost is nearly zero: Infinite scalability and duplication possible	1) Limited by physical production (supply chain, manufacturing facilities) and varying consumer demand across price segments 2) No network effects; instead, high capital investment and real-world data acquisition serve as entry barriers
Market share	Winner-takes-all	Regional oligopoly
Regulation	Regulation applies to both, but physical platforms face stricter and more enforceable regulatory frameworks	

Source: Samsung Securities

The stock market is beginning to reflect this impending transition—from the sunset of ICE autos to the dawn of physical AI—in valuations. In the West, HMC/Kia have emerged as the only credible challenger to Tesla, together rising to become the 4th-largest mobility player by market cap globally. Since the pandemic, only Tesla and HMC/Kia have seen sustained enterprise value growth. Chinese EV makers, despite their volume dominance, are losing ground. Intense competition in China and persistently low margins have eroded their valuations since their 2020 IPOs. While their scale remains intimidating, they lack the financial capacity to fund the massive physical AI infra required for long-term leadership. They are struggling to achieve profitability due to cutthroat competition in China.

Global automakers: Market cap trends since the pandemic

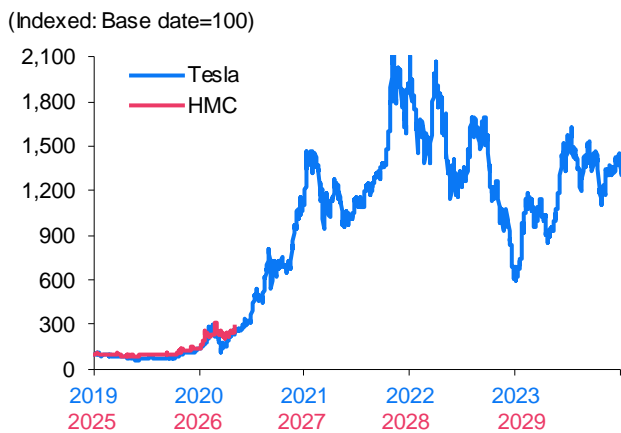


Note: Chinese EV manufacturers — BYD, Xiaomi, Nio, XPeng, Li Auto
* As of end-May 2026

Sources: Bloomberg, Samsung Securities

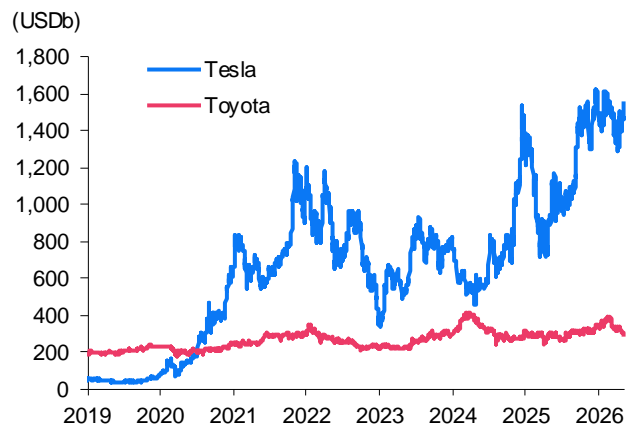
HMC/Kia (together) should emerge as an oligopolist in the mobility industry, as they are: 1) maintaining robust global sales volume thanks to their diverse powertrain offerings; 2) leveraging their massive vehicle fleets as data assets; and 3) aggressively ploughing capital into AI and robotics. While HMC/Kia’s sales volume, revenue, and operating profit all remain at 60-70% of Toyota’s, their pace of physical AI adoption is faster; moreover, HMG’s robotics division is already a global top-tier entity. HMG’s Robot Metaplant Application Center (RMAC) is scheduled to come online in August, followed by the establishment of Robotics America. These milestones should help lift HMC and Kia’s market cap. Specifically, by 2027, the combined market cap of HMC/Kia is projected to surpass Toyota’s, which would be the definitive sign of the times—*ie*, that the internal combustion engine era is giving way to the physical AI epoch.

Market cap: HMC vs Tesla



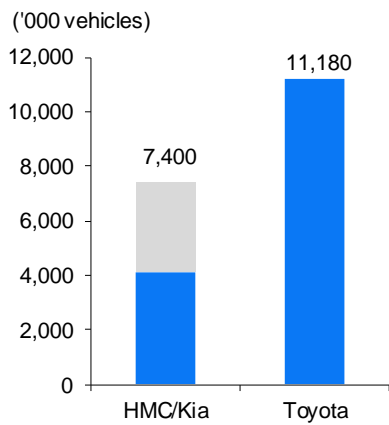
Source: Bloomberg, Samsung Securities

Market cap: Tesla vs Toyota



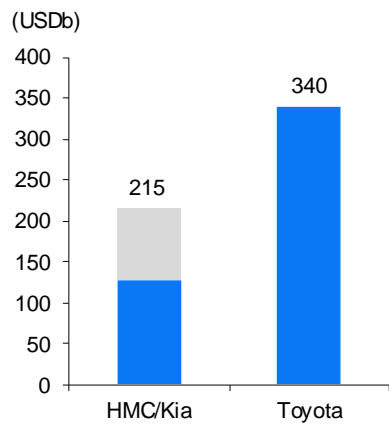
Source: Bloomberg, Samsung Securities

Global sales volume: HMG vs Toyota (2026)



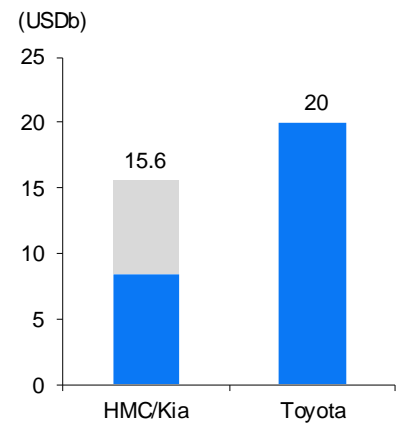
Note: HMC/Kia figures are Samsung Securities estimates; Toyota figures are FY27 guidance
Source: Company data, Samsung Securities.

Consolidated sales: HMG vs Toyota (2026)



Note: HMC/Kia figures are Samsung Securities estimates; Toyota figures are FY27 guidance
Source: Company data, Samsung Securities.

Operating profit: HMG vs Toyota (2026)



Note: HMC/Kia figures are Samsung Securities estimates; Toyota figures are FY27 guidance
Source: Company data, Samsung Securities.

The next bottleneck: Robot behavior data

HMC/Kia's source of massive capital

How will HMC/Kia secure the massive capital needed to become dominant players in the physical AI era? Their global sales have stalled (since 2023), and profitability has peaked. Although Kia currently holds the highest profitability among global automakers, its margins have been falling since 2023.

This earnings slowdown is translating into deteriorating cash flows. Within HMG, funding for new initiatives is shared jointly by HMC, Kia, and Hyundai Mobis. While Kia and Hyundai Mobis maintain robust operating cash flows—allowing them to sustain both investments and shareholder returns while concurrently accumulating surplus cash—HMC's operating cash flow has weakened. As a result, the trio's combined net cash position declined KRW3.5t in 2025. The costs of physical AI development (data centers and operational expenses) have yet to begin in earnest. Meanwhile, the group cannot easily reduce its committed shareholder returns: 35% of net profit at HMC/Kia, and 30% at Hyundai Mobis. Given slowing auto demand, intensifying competition, and looming physical AI investments, the trio's cash flow is likely to continue contracting. As of end-2025, the trio's net cash stood at KRW40t. While existing cash reserves can be used to cover cash-flow shortfalls over the next 2-3 years, physical AI investments are likely to span longer time frames. For context, Tesla required 7 years to accumulate the 10b miles of driving data it claims are necessary to achieve human-level FSD performance.

HMG (big 3): Cash flows and net cash positions, by firm

(KRWb)	2021	2022	2023	2024	2025
Hyundai Motor*	11,928	14,819	16,888	18,978	12,749
Kia	7,360	9,333	11,297	12,564	9,054
Mobis	2,609	2,154	5,343	4,253	4,473
Operating cash flow	21,896	26,307	33,527	35,795	26,276
Capex + equity investments	-7,571	-11,625	-15,742	-18,375	-19,514
Dividends	-2,051	-2,926	-4,269	-6,514	-5,841
Treasury stock buybacks	0	0	-650	-1,563	-1,972
Total cash outflows	-9,622	-14,551	-20,662	-26,452	-27,327
Net cash flow	12,274	11,756	12,866	9,343	-1,051
Net cash position	27,363	30,412	40,698	43,583	40,045

Note: Hyundai Motor figures exclude financial segment operating cash flow and net cash.

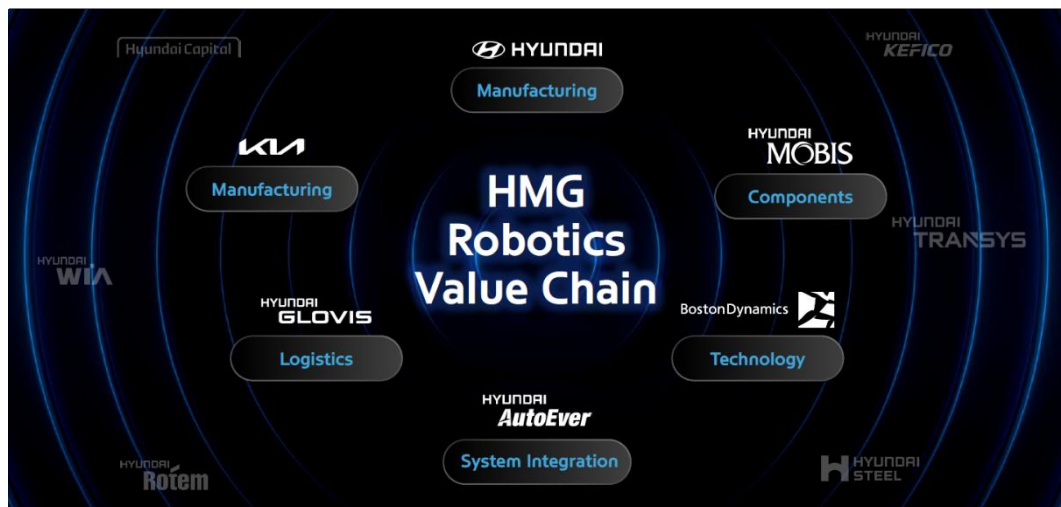
Source: Company reports, Samsung Securities

HMG's approach to physical AI contrasts with Tesla's. While Tesla has strategically brought everything in-house—from AI models, robotics, vehicle design, inference chips, and data collection—HMG is pursuing a strategy of expanding its ecosystem through collaborating with partners.

Tesla leverages its high market valuation and capital market access to raise funds via equity offerings. Its early ability to equip EVs with chips and sensors and collect driving data stemmed from the massive capital it raised during the initial EV boom. Capital markets reward firm not for technological innovation alone, but also for successful mass-production and commercialization. Tesla was recognized as an EV leader—it was the first to generate profits through EV mass-production. It capitalized on this dynamic: In 2020, shortly after turning profitable, Tesla raised USD12.3b (KRW20t) through three equity offerings. At the time of the equity offerings, Tesla's P/E ranged 80-100x. Each offering was perceived as validation of growth, driving the stock price higher. Of note, USD12.3b is sufficient to build EV production capacity (3.7m) or purchase 0.2m Nvidia Blackwell GPUs.

HMC/Kia's capital-raising strategy is likely to diverge from Tesla's. While HMC's valuation has improved, its P/E remains at 13-15x, and Kia's is only 7-8x—limiting the viability of equity offerings as a primary funding tool. Instead, HMC/Kia are likely to raise capital through: 1) joint investments with technology partners; 2) monetizing proprietary data assets; and/or 3) selling stakes in their subsidiaries (such as potentially listing their Indian operations; to reallocate capital). A follow-up report will detail these capital reallocation strategies.

HMG: Robotics value chain



Key Atlas Partnerships
Google DeepMind AI Partnership



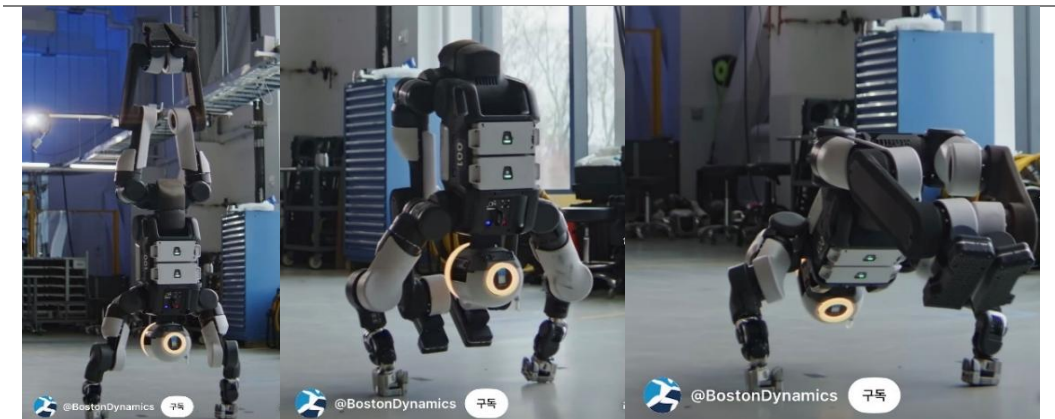
Source: Company data

Technological innovations that reshape the world involve countless trials, requiring vast amounts of capital and top-tier talent. Capital markets channel funding mainly to the leaders of a new era. Companies that secure substantial capital can attract the talent needed to overcome technical bottlenecks, and this talent focuses intensely on problem solving. As a result, during periods of technology paradigm shifts, the gap between first movers and fast followers tends to widen.

In the physical AI era—where hardware platforms stand at the core—being a fast follower is a strategy destined to fail. HMC/Kia have already experienced this in the EV transition: Delayed progress in autonomous driving (vs Tesla and Chinese EV makers) led to the perception that HMG’s future was uncertain. Until they revealed their robotics capabilities, HMC/Kia carried the lowest valuations among global automakers.

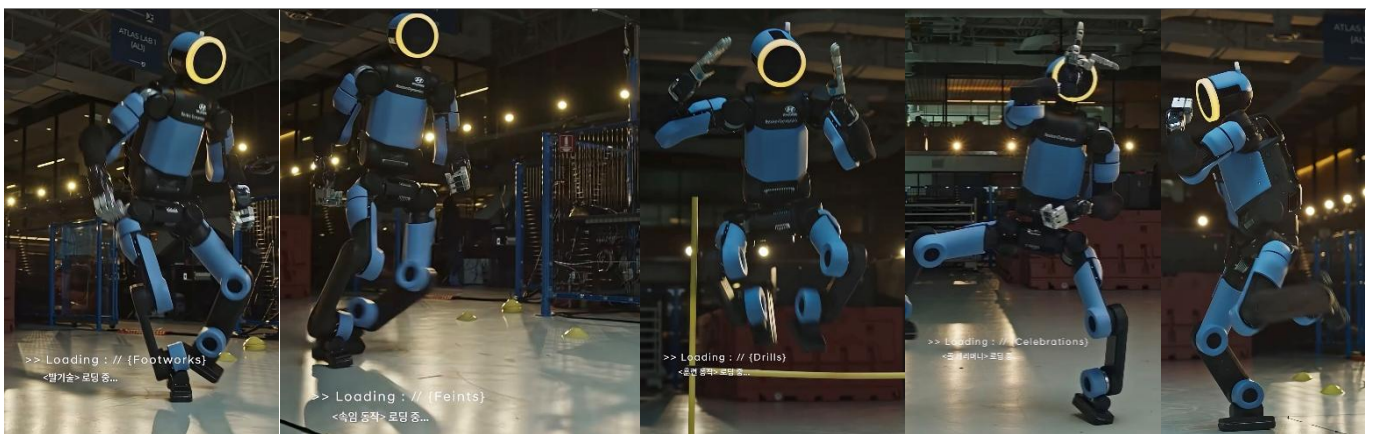
Fortunately, HMG is moving swiftly in robotics. This urgency reflects a clear understanding of the critical importance of market leadership and the need to attract capital and talent. Since May, HMG has repeatedly shown new Atlas robotics demonstrations and participated in global conferences to signal its readiness for the physical AI era. As HMG’s market valuation rises, its data assets and robotic joint ventures gain greater pricing power. With increased capital and talent flowing in, HMC/Kia are poised to accelerate their growth and become dominant players in the physical AI era.

Boston Dynamics: Atlas gymnastics video



Source: Boston Dynamics

Hyundai Motor Group: World Cup promotion video (Next Starts Now)



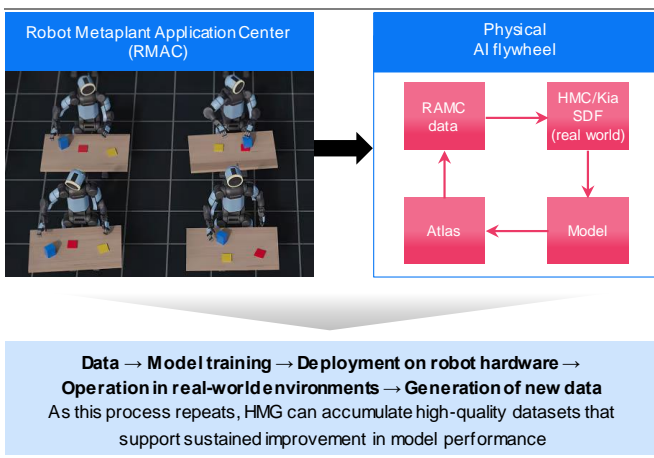
Source: Boston Dynamics

HMG positioned at bottleneck of US robotics industry

In addition to Boston Dynamics, HMG plans to establish two US-based entities for its robotics business: Robot Metaplant Application Center (RMAC; a training facility) and Robotics America (a manufacturing plant). Both should be structured as joint ventures. Particular attention should be paid to RMAC's equity structure, as Google DeepMind and Nvidia are potential strategic investors.

There are three reasons we Google DeepMind and Nvidia are potential strategic investors. First, both of them require vast, real-world robotics action data to refine their foundation models. Unlike internet text data, robotics action data must be collected from specific sensors, mounting configurations, and physical environments—requiring massive device deployment and controlled settings. Neither Google nor Nvidia owns physical infrastructure or large-scale device networks needed to generate such data at scale. HMG, by contrast, operates over 100 factories globally and can generate action data by deploying Atlas at its own facilities. Indeed, HMG plans to deploy 30,000 Atlas units internally to generate the data. By investing in RMAC, Google DeepMind and Nvidia could gain direct access to this proprietary dataset. If they choose not to take equity in Boston Dynamics, they may choose to enter data licensing agreements instead—similar to how Google pays USD60m *pa* to Reddit for data to refine Gemini.

HMG: Physical AI flywheel



Source: Samsung Securities

Metaplant: Collaborative robots working alongside humans on an assembly line



Source: HMC

Second, both Google and Nvidia are key players in the data center infrastructure segment, which segment is required for robot training. Google leads the global cloud platform market, while Nvidia dominates the supply of AI training chips (eg, the H100 and H200) that power these systems. HMG is one of Nvidia's major customers, having committed to purchasing 50,000 of its Blackwell chips. Recognizing robotics as a key growth frontier for inference markets, Nvidia has strategically invested in leading robotics companies—including Figure AI, Agility Robotics, and Skild AI.

Third, both Google and Nvidia are also active in the inference chip market. The AI industry has moved beyond the training phase and is now entering the era of inference, prompting former Nvidia clients like Tesla and Chinese EV manufacturers to develop their own custom chips. To secure long-term partnerships, Nvidia is expected to actively engage with HMG's robotics division.

HMG can monetize the data collected (via RMAC) by licensing them to tech companies and robotics developers. Additionally, through Robotics America, it could establish a robot contract manufacturing business (a robot foundry), producing robots for tech firms that lack in-house manufacturing capabilities. Today, nearly every major tech company has entered the robotics arena, but most focus exclusively on developing foundational AI models, with a goal of becoming the 'OS' of robotics. Yet, aside from Tesla and Amazon, few have the physical infrastructure to deploy robots at scale. As a result, they rely heavily on external sources for high-quality, real-world data to train and validate their systems.

Leveraging its six decades' worth of auto manufacturing expertise, deeply-integrated supply chain, and strategic acquisition of Boston Dynamics five years ago, HMG stands at a critical bottleneck in an industry that is poised to become the next major frontier of tech investment (following the rise of LLMs). For industries that are seeing surges in demand, control over such bottlenecks typically results in the related firms trading at a premium. The start of RMAC in 3Q26 should serve as a decisive milestone, clarifying where true value and control reside in the robotics ecosystem.

US tech giants: Current status of robotics businesses

Company	Timeline	Status
Tesla	2025	Unveiled Optimus Gen 2.5; conducting limited field tests in factories.
	2026	Full-scale mass production of Optimus scheduled for August; targeting 10x annual production growth and external sales by H2.
Nvidia	2024	Launched GR00T, a foundational AI model platform dedicated to robotics development.
	2025	Released Jetson Thor, a compact computer designed for humanoid robots, in the first half of the year.
Google DeepMind	2024	Introduced AI models RT-1, RT-2, and AutoRT—designed to serve as the 'brain' of robots. Combined LLM and VLM capabilities to enable autonomous environmental perception and task execution.
Amazon	2024	Invested in Physical Intelligence, a startup developing large-scale AI models and algorithms to integrate AGI into robots.
	2026	Completed two M&As: Fauna Robotics (humanoid robot startup) and River Technologies (last-mile delivery robot company).
	2027	Plans to replace over 160,000 human roles with robots.
	2033	Aims to automate 600,000 positions overall.
Meta	2025	Partnered with Ghost Robotics to launch Digit 360, a multimodal sensory system with human-level tactile feedback. Partnered with YuanYi Robotics to launch the next-generation robotic hand, 'Allegro Hand'. Officially entered the humanoid robotics space; hired Marc Whitten, former CEO of GM Cruise. Allocated USD65b in 2025 for robotics and AI infrastructure investments.
	2026	Declared software a current bottleneck; shifted focus from building robots in-house to developing a robotics software platform for third-party adoption. Acquired Assured Robot Intelligence, a startup developing foundational robot AI models, in May.
Apple	2024	Redirected focus from electric vehicle development to home robotics; targeting release of mobile robots and tabletop home devices.
	2025	Developing tabletop robot under project 'J595', targeting a 2027 launch with a price goal of USD1,000.

Source: Company data, Samsung Securities

HMC/Kia to launch real-world data business before manufacturing robots

According to Nvidia’s GROOT N1 paper (May 2025), training high-performing robot AI models requires three distinct data types. First, internet-sourced data—text, images, and video—are used to teach robots general world knowledge and language. Widely available, these data lack physical action. Second, synthetic data, generated in simulated environments. Such data are cheap and infinitely scalable, but fundamentally limited in terms of ability to replicate real-world physics. Third, real-world action data, which are collected from physical sensors (*eg*, joint torque, force/haptic feedback, RGB cameras, *etc*), are high quality, sparse, and costly.

Real-world data cannot be replicated by online or synthetic sources due to the following characteristics:

- **Contact dynamics:** The subtle forces, deformations, and slippage when a gripper grasps an object are invisible to cameras.
- **6-axis joint actuation data:** Motor current, torque, and joint-angle data from real-world robot operations are difficult to precisely replicate in simulations.
- **Authentic diversity:** Dust, changing lighting, and unexpected object placements—only the real world provides this unstructured complexity at scale.
- **Failure recovery trajectories:** How a robot recovers from a misstep is critical to robustness. These real-world recovery patterns are nearly impossible to simulate accurately.

Nvidia’s GROOT N1 paper outlines a data pyramid: As you move from the bottom of the pyramid to the top, the volume of data decreases sharply but their quality and value rise exponentially. For GROOT N1, Nvidia used 50,000 hours of H100 compute, combining internet video, synthetic data, and teleoperated real-world data in a layered architecture. While the portion of synthetic data was high, Nvidia explicitly noted that without high-quality real-world data, model performance degrades significantly. One hour of real-world robot data delivers training efficiency equivalent to hundreds of hours of synthetic data.

In Mar 2025, Nvidia acquired Gretel, a synthetic data provider, for USD320m. Elsewhere, Meta invested USD14.8b to secure a 49% stake in Scale AI—a company that generates and labels training data using human annotators. Scale AI employs workers across low-wage countries like the Philippines, Nigeria, and Kenya, using algorithmic workflows to annotate images, text, and audio. It adds margins of over 50% on labor costs. This race for high-value training data has escalated into a full-scale M&A battle worth billions of dollars.

Data types required for robot AI model training

Data type	Components	Characteristics
Internet data	Text, images, video	Abundant but lacks physical action data
Synthetic data	Simulation trajectories, virtual environments	Low-cost but limited sim-to-real transfer
Real-world action data	Joint torque, force/tactile sensors, RGB video, multi-axis motion	Scarce, high cost, and high quality

Source: Nvidia GROOT N1 paper, Samsung Securities

Real-world data: High value, high cost



Source: Nvidia GROOT N1 paper, Silicon Valley Robotics Center, Samsung Securities

Scale AI began in 2016 by providing labeling services for autonomous vehicles, serving early clients like GM Cruise and Lyft. Its sales came to USD50m in 2020. The surge in demand for LLMs after the launch of ChatGPT in 2022 triggered a strategic pivot towards providing data for LLM training, sparking explosive sales growth: Sales of USD0.76b in 2023 vs USD2b in 2025. In Jun 2025, Meta invested USD14.3b for a 49% stake in the firm, valuing Scale AI at USD29b. But Meta’s large stake acquisition sparked a backlash. Key Scale AI clients—eg, Google (which spent USD150m *pa* on data provided by Scale AI), OpenAI, xAI, and Microsoft—have scaled back or terminated their contracts with the firm.

According to the Silicon Valley Robotics Center’s State of Robotics 2026 report, the cost of collecting high-quality teleoperated robot data is USD136 per hour (60% less than the USD340/hr in early 2024). In contrast, online data, measured by crawling costs, averages just USD0.001 per hour. Even with this decline in the cost of collecting high-quality teleoperated robot data, such data remain tens of thousands of times more expensive than internet-sourced data because of scarcity. Online data can be infinitely replicated by crawlers, but robotic action data need physical robots operating in the real world.

Taking these dynamics into account, we can estimate RMAC’s potential value. If RMAC were to operate like Scale AI—selling data to multiple clients—its minimum valuation could reach USD29b, equivalent to roughly 21% of HMC/Kia’s combined market cap. To preserve data neutrality, however, any investment from Nvidia or Google DeepMind should be capped at 10% each.

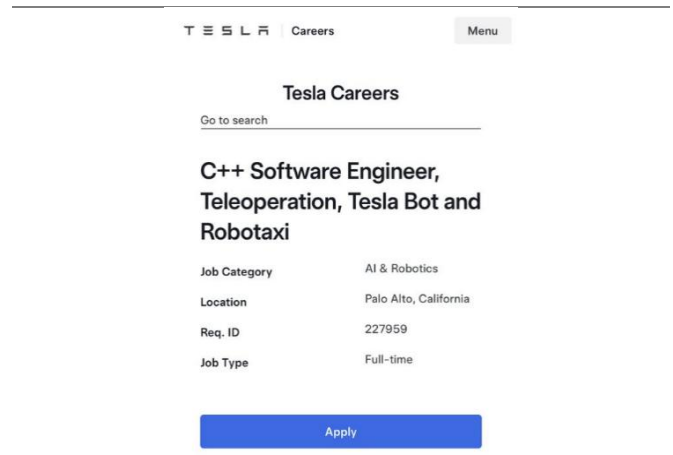
To estimate the annual value of data generated by RMAC, we assume that: 1) robots operate 20 hours/day, 250 days/year; and 2) data are priced at USD72/hour, based on Tesla’s 2025 rate of USD48/hour for teleoperated labor, plus a 50% markup modeled after Scale AI’s business model. Under these assumptions, RMAC generated USD4m in annualized data value in early 2026, growing to an estimated USD1.8b in 2028 and USD10.8b in 2030.

Tesla Optimus: Learning via teleoperation



Source: X

Tesla: Teleoperation job posting (USD48/hr)



Source: Company data

RMAC data value projection

	Units deployed (units)	Annual data hours ('000 hours)	Annual data value (USDm)	KRW equivalent (USDb)
2026 proof of concept stage	10	50	4	5.2
2027 early stage	500	2,500	180	261
2028 mass-production	5,000	25,000	1,800	2,610
2030 expansion	30,000	150,000	10,800	15,660

Note: Exchange rate applied: KRW1,450/USD.

Source: Samsung Securities

The assembly lines at Hyundai Motor Group Metaplant America (HMGMA) employ around 1,100 workers. If production scales to 500,000 autos *pa* by 2030, the plant is expected to employ around 1,500 workers. If HMC and Kia equip these workers with smart glasses and gloves embedded with haptic sensors, they could capture rich, real-world action data during routine assembly tasks. This data could be packaged and sold with robot-generated datasets. This means that the Korean carmakers can generate new revenue (data sales), separate from vehicle sales, without hiring additional staff.

We calculated the value of data generated on an assembly line by assuming workers operate 8 hours a day, 250 days a year, with data valued at USD72 per hour. At HMGMA alone, this would result in USD150m in data value in 2027, rising to USD210m by 2030. If HMG collected data the same way at all of its overseas factories, the total data value would be much higher.

Data value generated by human workers at the Metaplant

	Number of workers	Annual data hours ('000 hours)	Annual data value (USDm)	KRW equivalent (USDb)
2027	1,100	2,200	158	230
2028	1,100	2,200	158	230
2030	1,500	3,000	216	313

Source: Samsung Securities

If HMC and Kia sell this data in the US, the related revenue could start at just USD17m in 2027 before surging to USD2.7b by 2030. At first, only 10% of the data might be sold to non-affiliates, but as the data get better and more useful, that share may rise to 50% by 2030. We assume a 50% operating margin on the data, which figure is typical for software businesses. The big advantage of selling data is that once they are created, they can be sold again and again to different customers—related profit could actually exceed 50% over time.

By 2030, the data sales business could generate USD2.7b (KRW4t) in operating profit—about 19% of HMC and Kia's combined 2025 operating profit. If we apply a P/E of 30x (typical for platform companies) to our 2030 net-profit estimate, the data business could be worth USD65b. This is 2.2x the enterprise value of Scale AI and 49% of HMC and Kia's combined market cap. In short, RMAC is likely to drive a valuation re-rating for HMC and Kia.

HMC/Kia: Robot data business profitability forecasts

	Annual data value (RMAC + Overseas plants)	External sales ratio (%)	Revenue (USDm)	Operating profit* (USDm)	Net profit** (USDm)
2026	4	0	n/a	n/a	n/a
2027	338	10	34	17	13
2028	1,958	30	588	294	232
2030	11,016	50	5,508	2,754	2,176

Note: *Assumes operating margin of 50%;

**Assumes corporate tax rate of 21%

Source: Samsung Securities

HMC is essentially a physical AI ETF

HMC has lower profitability and weaker sales performance compared to Kia. However, recognized as the flagship of the group’s robotics initiative, its P/E has reached 13-15x—twice Kia’s—reflecting the value of its asset base. Since its separation from Hyundai Group in Sep 2000, HMG has made investments in vertically integrating its automotive value chain and, post-pandemic, expanding into mobility services. Over the past 25 years, HMC has shouldered more than 50% of HMG’s total investment burden. While HMC’s asset base has expanded, its new ventures have either taken years to generate profit or carried high failure risk, weighing on its ROE.

Now, however, most of its affiliates have strong profitability, robust free cash flows, and ample liquidity. The financial burden shouldered by HMC relating to the group’s new business investments has diminished. Over the past two decades, Kia has recorded the highest earnings growth among HMG’s affiliates. While Kia sells roughly 1m fewer autos *pa* than HMC (HMC also holds a 34.53% stake in Kia), its superior profitability means they generate similar operating profits. Kia’s stronger earnings have helped ease HMC’s R&D cost burden and directly benefited HMC’s finance division. Hyundai Mobis, too, has turned profitable at its module business after overcoming losses in China. Hyundai Mobis now has the financial strength to independently manage its automotive E/E and robotics value chains.

Yet, since CES 2026, the group’s robotics initiatives have drawn significant attention—highlighting the disparity in equity stakes: HMC holds 37% of Boston Dynamics (vs Kia’s 17% stake) and a 55% stake in HMG Robotics Lab (vs Kia’s 45% stake). If HMC’s stake in future entities such as the RMAC and the robotics manufacturing plant exceeds 50%, it will report consolidated sales and consolidated operating profit from data services and robot production. Kia, by contrast, will use equity-method accounting.

In addition, all of HMC’s subsidiaries play critical roles in the physical AI business. Kia will engage in robotics behavioral data services and robotics production, alongside HMC. Hyundai Rotem (33.77% owned by HMC), traditionally focused on rail vehicles, now generates 10% of HMC’s consolidated operating profit thanks to surging exports of the K2 main battle tank. It plans to expand its defense initiatives into unmanned K2 tanks and aerospace technology development. The unmanned technologies at its defense business are increasingly integrating autonomous EV and robotics capabilities. Hyundai Rotem has already developed and donated an unmanned fire-fighting robot to the National Fire Agency.

Hyundai Engineering & Construction (20.95% owned by HMC) is experiencing a stock-price surge thanks to opportunities in nuclear power plant construction and data-center development, offsetting

sluggishness in the residential construction field. Its housing projects also serve as real-world testbeds for robotics adoption and smart living environments. For instance, for the Apgujeong Hyundai Apartment redevelopment project, Hyundai E&C has proposed integrating robot-friendly infrastructure—eg, autonomous shuttles, personal mobility, last-mile delivery, and EV charging robots.

Hyundai AutoEver (31.59% owned by HMC) commands the highest P/E among group affiliates, reflecting lofty market expectations surrounding its robot control, system integration (SI), and after-sale service businesses. As HMC expands its mobility business horizontally, its direct cost burden is easing while the value of its subsidiaries comes into sharper focus. HMC is not merely a direct operator of physical AI technologies—it also owns a portfolio of subsidiaries that together form an ecosystem. In essence, it functions much like an ETF for physical AI.

Hyundai Motor: Subsidiary equity value

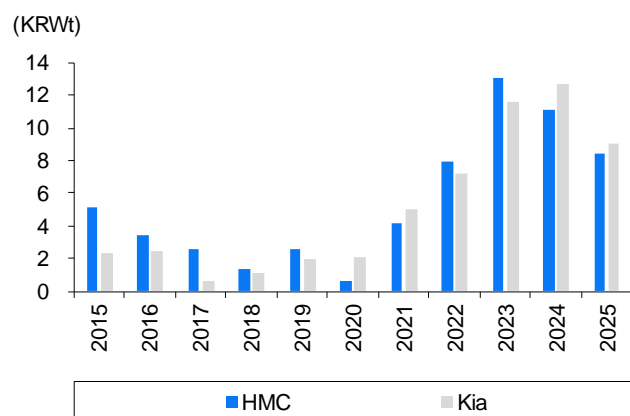
Physical AI category	Subsidiary	Ownership (%)	Book value (KRWb)	Market cap* (KRWb)	Market cap × Ownership × NAV discount** (KRWb)	Notes
Robotics	Boston Dynamics***	27.97	469			Kia's ownership: 17.23%
	Robotics LAB	55				Kia's ownership: 45%
	RMAC	TBD				Operations to commence in 2H26
	Robotics America	TBD				To be established in 2H26
SI, Robot control	Hyundai AutoEver	31.59	572	17,606	3,893	Kia's ownership: 16.24%
Autonomous driving / Robotics	Kia	35.17	21,679	65,238	16,061	
Defense / Unmanned defense	Hyundai Rotem	33.77	891	23,411	5,534	
Nuclear power / Data Centers	Hyundai Construction	20.95	3,195	16,914	2,480	Kia's ownership: 5.24%
Finance	Hyundai Capital	59.72	4,553			Kia's ownership: 40.13%
	Hyundai Card	36.96	1,587			Kia's ownership: 6.48%
Total			32,945		27,969	

Note: * As of May 26, ** 30% of NAV discount is applied, *** Includes HMG Global's stake in Boston Dynamics.

Bold entries are consolidated subsidiaries; others are accounted for under the equity method.

Source: Hyundai Motor, Samsung Securities

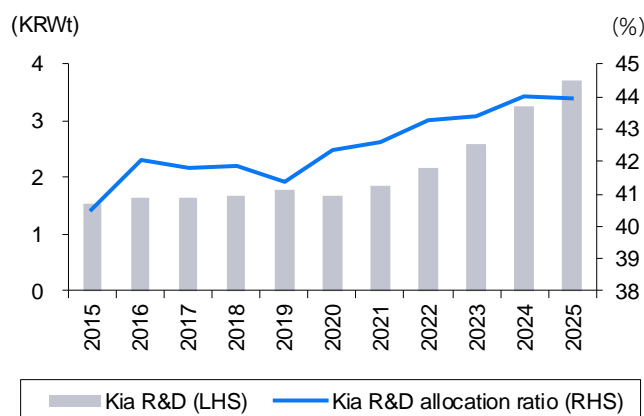
Operating profit: HMC* vs Kia



Note: *Auto division;

Source: Company data, Samsung Securities

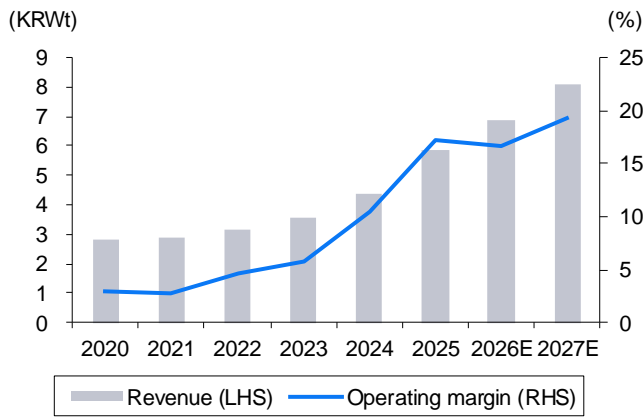
Kia: R&D expenses and allocation ratio



Note: Allocation ratio is based on Kia's share of Kia's + HMC's total R&D costs

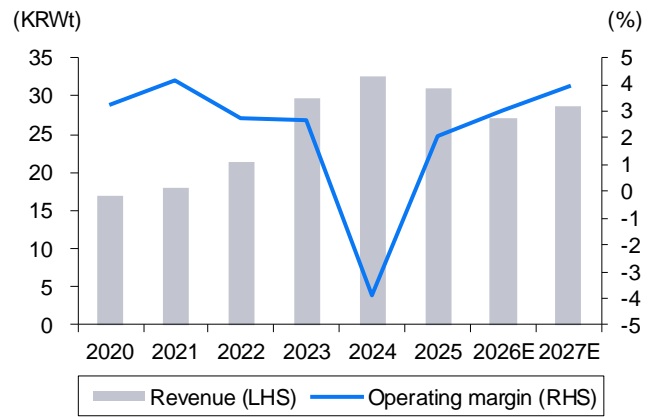
Source: Company data, Samsung Securities

Hyundai Rotem: Sales and operating margin



Source: Company data, Samsung Securities

Hyundai E&C: Sales and operating margin



Note: Hyundai Engineering & Construction
Source: Company data, Samsung Securities

The next bottleneck: Robot thermal management

The most pressing challenge for robot manufacturers is thermal management

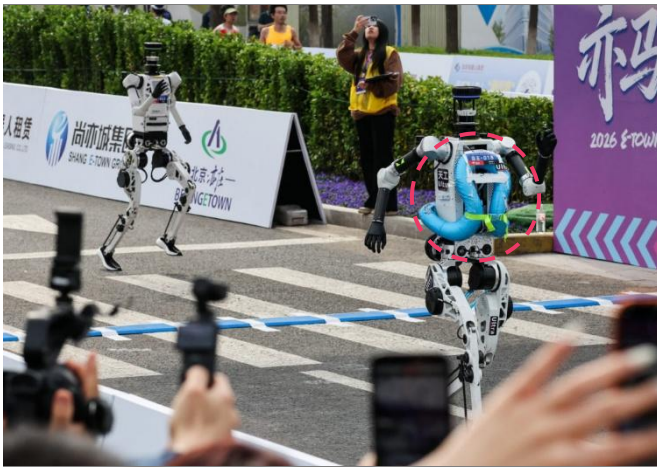
Elon Musk has identified dexterous hand coordination as the biggest challenge in robot hardware, noting that it is delaying mass-production of Optimus Gen3. However, for industrial robots—designed for logistics and factory deployment rather than general-purpose use—the bottleneck emerges even earlier. Many of these robots rely on grippers. Boston Dynamics, for example, believes Atlas, equipped with four grippers, can already perform most warehouse and factory material-handling tasks.

Thermal management is a universal industry challenge. In industrial environments, it often becomes the first critical bottleneck—before issues of dexterity even arise. Early-stage tasks such as heavy lifting, part handling, and palletizing may not require fine motor control, but they do demand uninterrupted 24/7 operation. During the Samsung Global Investors Conference on May 11, Robotics Lab engineers confirmed that thermal management remained their top concern.

The challenge was evident in the Beijing E-Town humanoid robot half-marathons—organized by China in Apr 2025 and 2026 to showcase its robotics capabilities. The limiting factor was neither algorithmic intelligence nor torque, but thermal failure. In 2025, 21 robots started the race, but only six finished. Many stalled or collapsed mid-race due to overheating joints. Engineers ran alongside the robots, spraying them with cooling mist. One robot, Xuanfeng Xiaozhi, crossed the finish line limping, with thermal pads duct-taped across its chest.

In 2026, over 300 robots entered the competition, and the winning robot made headlines by finishing faster than the human half-marathon world record. Building on lessons from the previous year, nearly all teams adopted liquid cooling systems. The winning team, Honor, took a strategic approach with its robot, Lightning: during pit stops, the robot was sprayed with industrial-grade coolant, its battery was rapidly swapped, and it rejoined the race.

Beijing half marathon: Robot thermal management



Source: Reuters

Beijing half marathon: Robot Thermal Management



Source: Reddit

EVs and humanoid robots both rely on high-power motors and inverters, but their distinct spatial constraints and operational mechanisms demand fundamentally different approaches to thermal management. In EVs, heat is concentrated primarily in the battery and motor. The vehicle’s underbody and front end provide ample space for coolant lines, making liquid cooling the dominant solution. Cooling plates are positioned between hundreds of battery cells to conduct heat away efficiently, then channel it via pumps and piping to a front-mounted radiator, where airflow generated during driving dissipates the heat.

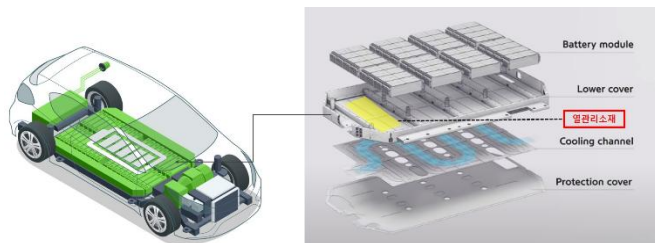
In humanoid robots, in contrast, heat sources are distributed across dozens of joints, each housing an actuator. While heat output at any single joint is modest, the cumulative effect of continuous operation creates persistent thermal buildup. Routing coolant lines through moving joints is not practical, as repeated movement would increase the risk of fatigue or rupture, compromising durability. Boston Dynamics’ Atlas, for instance, prioritizes a cable-free design to reduce weight and simplify maintenance, making liquid cooling impractical. Instead, thermal management relies on passive air-cooling strategies. Optimized materials, actuator geometry, and capacitor design work together to maximize natural heat dissipation. This makes overall robot architecture—led by Boston Dynamics—increasingly critical, while also elevating the strategic importance of suppliers such as Hyundai Mobis (actuators) and Samwha Capacitor (which supplies both EV and robot-grade capacitors).

Difference in heat generation structure: EVs vs humanoid robots

Category	EV	Humanoid robot
Primary heat sources	Battery, drive motor	Actuators, inference chips
Heat distribution	Concentrated (clear thermal path from fixed components to cooling jacket)	Distributed (3+ heat sources coexist within a single joint)
Dominant cooling method	Liquid cooling (water jacket), oil cooling	Natural convection (no fan), indirect conductive cooling
Operating temperature range	-40°C to 120°C (engine compartment baseline)	0°C to 45°C (indoor factory environment), with cumulative thermal stress under high-cycle operation
Space constraints	Relatively ample (dedicated cooling jacket space available)	Extremely limited (must be integrated within joint housing)
Weight sensitivity	Low	Very high (gram-level weight optimization required)
Coolant circulation	External pump and radiator loop	No external loop possible → passive heat dissipation prioritized

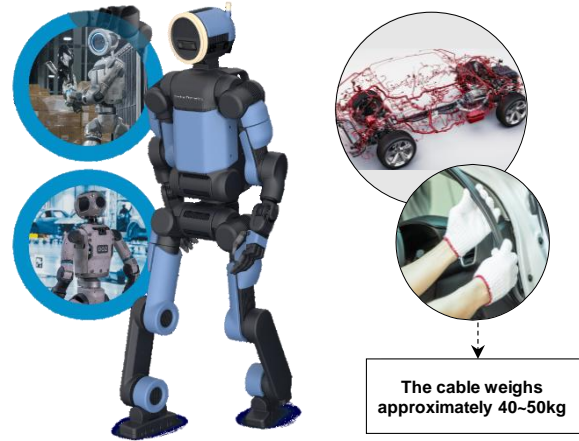
Source: Samsung Securities

Battery thermal management for EVs



Source: Samyang Corporation

Atlas Gen3: Employs cableless actuator structure



Source: Company data

Atlas’s thermal strategy is built on three complementary layers.

- **Structural passive cooling (heat-sink enclosure):** The actuator housing is precision-machined with dense, comb-like cooling fins to maximize surface area exposed to air. Heat generated within the motor is conducted through the housing into the robot’s aluminum outer shell, where airflow generated during movement dissipates it.
- **Phase-change material (PCM) integration:** During high-stress maneuvers—such as lifting a refrigerator or performing a backflip—joint temperatures can rise rapidly. Tiny PCM inserts within the actuators absorb these heat spikes through solid-to-liquid phase transitions, leveraging latent heat to delay thermal peaks and prevent system-level overheating.
- **Localized cooling for the main computer (the “brain”):** The head unit, which processes vast amounts of sensor data and runs end-to-end AI models, generates significant heat. While the joints do not use fans, Atlas incorporates a hybrid cooling chamber in the head, combining high-performance fans with waterproofing to prevent thermal throttling.

Atlas: Thermal management technology

Location	Cooling method	Operating principle	Atlas implementation
Battery	Battery thermal management system (BTMS)	Keeps cell temperature uniform via cooling plates	Removable battery pack design (marathon pit-stop style)
Inverter & driver	PCB thermal spreading + GaN low-loss	GaN reduces switching loss to 1/3-1/5 compared to Si	Driver ICs directly mounted onto joint housing
Motor windings	Thermally conductive epoxy potting	Epoxy fills gaps between windings and housing, eliminating thermal resistance	-
Motor housing	Aluminum fins with natural convection	Maximizes surface area to enhance convective heat transfer	Atlas outer profile features integrated fin structure
Reducer	Lubricant thermal conduction + housing conduction	Gear friction heat → lubricant → housing → ambient air	High-viscosity, heat-resistant grease used
System-wide	AI thermal duty cycle control	Real-time joint temperature monitoring → automatic power reduction at thermal thresholds	Software layer compensates for hardware thermal limits

Source: Boston Dynamics, Samsung Securities

To address the extreme thermal demands of robotics, actuators and capacitors play critical roles within the component ecosystem: actuators are the primary heat source, while capacitors enable precise, rapid power-output adjustments.

Role of actuator manufacturers in thermal management: Actuator makers are responsible for thermal isolation and low-friction engineering.

- **Separating gear heat from motor heat:** Frictional heat from meshing planetary and cycloidal gears can combine with electrical heat from the motor, leading to magnet demagnetization and torque loss. Actuator makers mitigate this risk by applying advanced low-friction coatings, such as diamond-like carbon (DLC), to gear surfaces.
- **Integrating thermal interface materials (TIMs):** At the assembly stage, manufacturers such as Hyundai Mobis embed high-conductivity thermal pads or gels to accelerate heat transfer from motor windings to external cooling fins.
- **Optimizing power semiconductors:** Replacing conventional silicon MOSFETs with gallium nitride (GaN) components in motor drivers increases switching speed by 10-100x, substantially reducing overall heat generation.

Role of thermal management in robot actuator systems

Design item	Thermal management requirements	Hyundai Mobis's capabilities
Motor housing material & geometry	Use of Al-SiC composite or high-purity aluminum alloy; integrated fin design to minimize thermal resistance	Proven experience in designing and machining housings for EV drive motors
Winding potting	Epoxy with thermal conductivity ≥ 3 W/m·K to fully fill windings; application of vacuum pressure impregnation (VPI) process	Currently applying VPI process in drive motor production
Reducer lubrication & Sealing	Selection of high-temperature grease; leak-proof sealing design with compensation for thermal expansion	Experience in lubrication design for EPS and e-Axle reducers
Driver IC integration	Direct thermal path design from GaN chip to housing for efficient heat dissipation	Requires co-design with power electronics partners
Thermal simulation	Preemptive elimination of hotspots via FEM-based thermal-fluid analysis; application of DFMEA	Standardized design process aligned with automotive component development
Durability validation	High-temperature cycling tests (-40°C to 130°C); MTBF verification under continuous operation	Robust reliability testing system compliant with IATF 16949

Source: Boston Dynamics, Samsung Securities

In robotics, capacitors serve as critical buffers that prevent electrical heat generation at its source.

- **Peak current buffering:** When robots lift heavy loads, sudden power demands can cause massive current spikes from the battery to the joint. Capacitors supply instantaneous power to actuators, preventing excessive power from flowing directly through wiring and circuits—where resistance would otherwise generate exponential heat. By delivering on-demand power locally, capacitors act as a first line of thermal defense that fundamentally suppresses the system's total electrical heat generation.
- **MLCC adoption expanding amid shift in power devices:** Replacing the motor driver IC for actuators with gallium nitride (GaN) power devices creates a cascade of improvements: the inverter runs cooler, enabling smaller capacitors, which frees up space in the joint and simplifies thermal design. MLCCs benefit from this structural transition.

Role of capacitors in robotics thermal management

Component	Type	Thermal management role	Supply chain relevance
Main DC bus	Film or high-capacity electrolytic	Absorbs regenerative energy surges to prevent battery overcharge/overheating; reduces inverter heat by suppressing voltage spikes	Samsung Condenser DC-link; high voltage/temperature tolerance is critical
Joint driver DC link	MLCC (ceramic)	Filters high-frequency ripple current from GaN switching; improves inverter efficiency and lowers system heat	Samsung Electro-Mechanics, TDK, Murata, Samsung Condenser; trend shifting from electrolytic to ceramic for GaN systems
AI computing board	Polymer tantalum + MLCC	Delivers instant current to CPU/GPU; suppresses power noise to prevent thermal miscalculation	Low-ESL, low-ESR high-capacity MLCCs

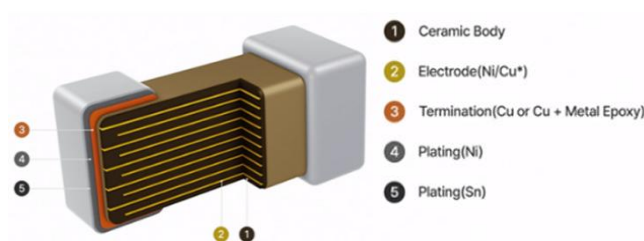
Source: Media, Samsung Securities

Robotics actuator



Source: Hyundai Mobis

MLCC (Multi-layer Ceramic Capacitor)



Source: Samsung Electro-Mechanics

Atlas's actuator design favors Hyundai Mobis

One of the most frequently asked questions at industry seminars is whether Hyundai Mobis can mass-produce actuators—particularly given its lack of in-house gear-reduction technology. Many assume it would need to rely on specialized external suppliers. However, as Chris Thorne, Director of Hardware Innovation at Boston Dynamics, noted during a March tech talk, a core principle behind Atlas's commercialization strategy is compatibility with the automotive supply chain. While the actuator itself was developed in-house by Boston Dynamics, Hyundai Mobis is deeply involved in designing it for mass-production. This is less about Hyundai Mobis entering an unfamiliar market and more about robotics adopting automotive manufacturing practices. Many technologies already familiar to automotive suppliers have been incorporated.

Thorne emphasized that Boston Dynamics' proprietary actuator delivers 2-5x the performance of commercial off-the-shelf alternatives. The central engineering challenge is overcoming the fragility of conventional gear reducers under impact loads. Atlas is designed for automotive factory environments, where components routinely weigh over 15 kg. The ability to withstand shock during lifting and movement is therefore essential. With a maximum payload of 45 kg, the hip and waist actuators—which bear the highest loads—use a hybrid gear system combining planetary and cycloidal reduction mechanisms. The knees and ankles, which absorb ground impact, use standard planetary gears. This optimization supports a modular architecture, allowing identical actuators to be deployed across multiple joints, reducing both complexity and cost.

Planetary gears are ubiquitous in automotive applications, including automatic transmissions, EV speed reducers, electric power steering (EPS), and hybrid power-split devices. Hyundai Mobis already

mass-produces planetary gears for EPS and e-Axle systems. Cycloidal reducers, by contrast, are valued for their high torque, low-speed operation, and durability, and have traditionally been used in industrial robotic arms and machine tools. However, automotive suppliers—with decades of expertise in precision machining, materials engineering, and quality control—are well positioned to adapt quickly to hybrid cycloidal designs.

The gear-tooth profile in this hybrid system requires tolerances of 0.001 mm—identical to the precision Hyundai Mobis already achieves in mass-produced EPS gears and EV drive reducers. The company can scale actuator gear production without additional greenfield investment, as its existing CNC hobbing, grinding, and heat-treatment lines—originally built for automotive gears—can be readily adapted for robot-actuator manufacturing.

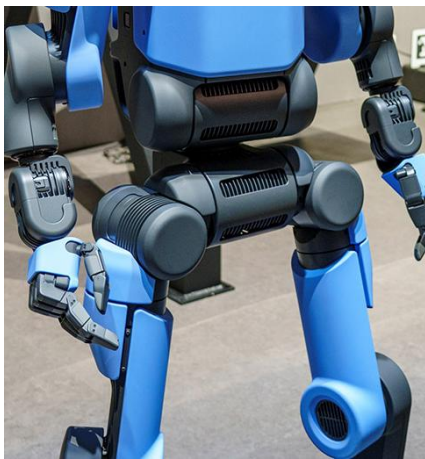
Even the planetary roller screw (PRS) linear actuators used in Atlas’s lower body (knees and ankles) are built on the same foundational technology as the company’s existing ball-screw and roller-screw products for EPS systems. The high-load-screw manufacturing capabilities developed during the transition to vehicle electrification can be directly applied to the production of these actuators.

Atlas: Actuator configuration

Location	Actuator type	Core reduction mechanism	Rationale
Hips, waist, neck	Rotary	Planetary + cycloidal hybrid	Requires 360° rotation range and high torque density
Shoulders, elbows	Rotary	Custom high-torque electric actuator	Needs multi-axis rotation and flexible manipulation
Knees, ankles	Linear	Planetary roller screw (PRS)	Distributes impact loads and supports lower-body weight loads
Fingers, grippers	Micro linear	Ball screw or lead screw	Enables precise grasping in confined spaces

Source: Boston Dynamics, Samsung Securities

Atlas: Hips and waist



Source: Boston Dynamics

Atlas: Knees and ankles



Source: Boston Dynamics

Atlas: Gripper



Source: Boston Dynamics

The robot-joint gearbox market encompasses several competing technologies. Harmonic drives—the dominant solution in industrial robotics for decades—transmit torque through the elastic deformation of a thin, cup-shaped flex spline. They offer exceptional compactness and near-zero backlash, enabling precise motion. However, their thin, flexible components are highly vulnerable to shock: a single

impact can cause catastrophic failure. As a result, they are well suited to stationary robotic arms but unsuitable for humanoid robots that must withstand dynamic impacts during locomotion.

Cycloidal reducers operate through an eccentric disc that engages multiple pins simultaneously, distributing load across numerous contact points. This architecture delivers high torque density and superior shock resistance. However, the eccentric disc's complex geometry makes machining difficult and costly, while vibration and noise remain challenging to control.




The planetary-cycloidal hybrid—commonly known as a Rotary Vector (RV) reducer—combines the compactness of a planetary gear stage with the multi-point load distribution of a cycloidal mechanism. In a two-stage design, the first stage reduces speed through planetary gears, while the second stage provides further reduction via a cycloidal disc driven by the planetary output. The result is very high torque density and exceptional impact resistance, making it well suited to high-load humanoid joints such as the hips and knees. Atlas's actuator represents a miniaturized, lightweight evolution of this RV architecture. While technically superior, it is also complex and costly to manufacture.

By contrast, quasi-direct-drive (QDD) actuators—promoted by Chinese companies such as Unitree as a low-cost alternative—are compact actuators built around low-ratio planetary gearboxes. Typically consisting of a frameless BLDC motor paired with a planetary gear set (6:1 to 15:1), QDD designs minimize gear reduction, transmitting motor torque to the joint with minimal intermediary gearing. This “quasi-direct” approach simplifies manufacturing, lowers cost, and improves backdrivability—the ability of external forces to rotate the motor in reverse.

Lower gear ratios require fewer gear teeth and simpler geometries, allowing looser manufacturing tolerances. As a result, QDD is well suited to rapid prototyping and low-cost, entry-level robots.

Backdrivability, however, is a double-edged sword. While it improves control, it also transmits external shocks directly to the motor and gears. When a 90 kg robot falls while running, instantaneous forces at the knee can reach several thousand newtons. In a low-ratio planetary gear system, these concentrated loads accelerate surface pitting and wear. Long-term durability under 24/7 industrial operating conditions remains unproven. In practice, Unitree's robots typically carry payloads of less than 1 kg and are targeted primarily at education and entertainment applications rather than manufacturing environments.

Comparison of main reducers used in humanoid robots

	Harmonic reducer	RV reducer	Planetary reducer
Image			
Structure	Flex spline, wave generator, rigid spline	Two-stage transmission structure	Sun gear + planetary gear + internal ring gear
Company	HDSI (Japan), Nidec-Shimpo (Japan), Leader Drive (China), SPG (Korea), SBB Tech (Korea)	Nabtesco (Japan), Sumitomo (Japan), Nabdrive (China), Xianjiwei (China), etc	ATG (Taiwan), APEX (Taiwan), Nidec-Shimpo (Japan), etc
Size	Small	Large	Small
Torque (Nm)	3.5-800	40-6,000	40-1,000
Backlash	Nearly 0 (ultra-precision)	Very small (similar to harmonic reducer)	Medium (higher than harmonic reducer)
Reduction ratio	High reduction ratio (30:1 ~ 320:1), single stage	Mid-high reduction ratio (50:1 ~ 200:1)	Low reduction ratio (~ 10: 1), single stage
Price (USD)	~150-700	~700-1,150	~55-230
Advantages	High gear ratios achievable; enables ultra-precision control	High durability; high torque	Simple structure, high efficiency
Shortcomings	Vulnerable to fatigue; low durability (prone to breaking)	Complex structure; large and heavy	Limited precision; low gear ratio requires multi-stage configuration
Application	(Low payload) Collaborative/industrial robot, humanoid	Vertical articulated robot (ship/auto plant), construction machinery, etc	Mobile robot, drone, humanoid lower body

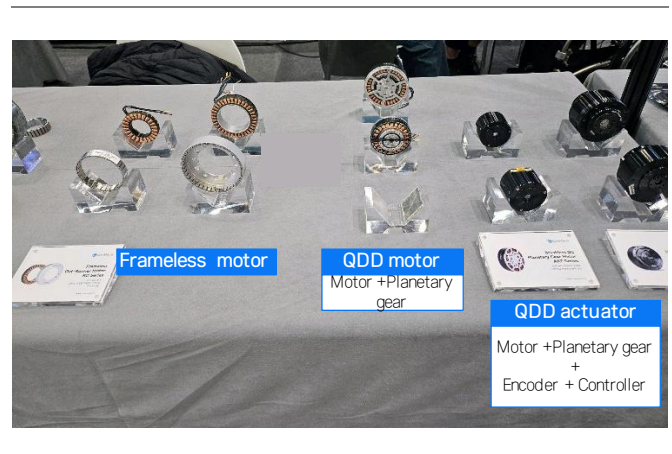
Source: Media

Cheetah robot: The first to feature QDD actuators



Source: MIT, Samsung Securities

CubeMars: Motor and QDD actuator

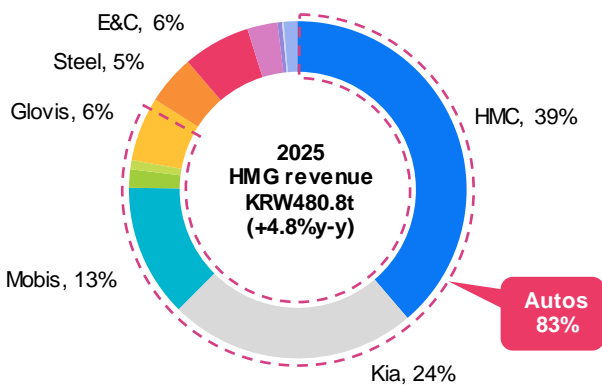


Source: Company data, Samsung Securities

HMG’s ambitious vision: A major opportunity across the value chain

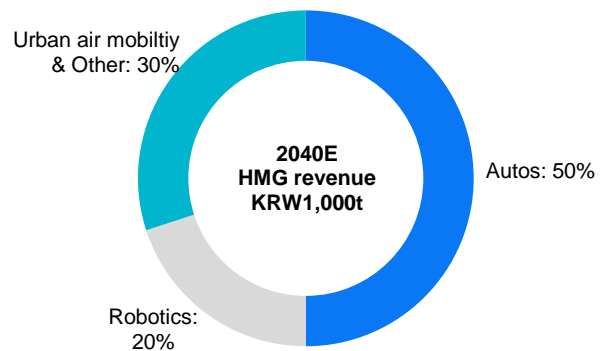
HMG’s push into robotics presents a significant opportunity for Korea’s broader automotive value chain. While initial revenue from supplying components for Atlas or MobED is expected to remain modest—less than 5% of consolidated sales—the group’s long-term vision, articulated by Chairman Chung Eui-sun, is far more ambitious: 50% of sales from automobiles, 20% from robotics, and 30% from urban air mobility (UAM) by 2040. As of 2024, HMG’s automotive business generated roughly KRW380t in sales. Assuming annual growth of 2-3%, automotive revenue could reach KRW500t by 2040. To achieve its 20% robotics target, the group would need to generate KRW200t in robotics revenue. If robot ASPs eventually converge with vehicle ASPs—around USD30,000—annual sales of roughly 4m units would be required. In effect, HMG is targeting a 100-fold increase in Atlas-related robotics volume.

Hyundai Motor Group: Revenue breakdown (2025)



Source: Bloomberg, Samsung Securities

Hyundai Motor Group: Revenue breakdown (2040E)



Source: Samsung Securities

The group aims to build its robotics value chain on the foundation of Korea’s existing automotive ecosystem. Much of the core hardware underpinning robotics—including electronics, sensors, and batteries—overlaps with technologies developed for autonomous EVs. As a result, suppliers already embedded in HMG’s EV and autonomous-driving supply chain are well positioned to expand into robotics.

Just as Korean suppliers that partnered with HMC and Kia during their global expansion in the 2000s outperformed those that remained focused on the domestic market over the following decade, companies that successfully establish positions in today’s robotics value chain are likely to gain a meaningful long-term advantage over those that do not.

Boston Dynamics: Robot value chain

Product	Component	Company	Notes	
E-Atlas	Actuator	Hyundai Mobis	Sub-component sourcing status is undecided	
	Head module	Hyundai Mobis		
	Body module, arm, leg	Hwashin		
	Battery	LG Energy Solution		
	Smart lighting	n/a		Bidding in progress
	SI / Control system	Hyundai AutoEver		
Spot	Actuator	HL Mando	2nd generation release planned for 2027	
	Leg Module	SL Corp		
Stretch (Logistics Robot)	Turn Signal	SL Corp		

Source: Company data, Samsung Securities

Robotics Lab: MobED value chain

Component	Company	Remarks
Lidar	SOS Lab	2 units per robot / Supplied as a module by SL Corp
Battery	Samsung SDI	Cylindrical
Edge chip	DeepX	DX-M1 NPU / Computing power: 30 FPS / Power consumption: 5 W
Actuator	Gyeyang Electric	12 units per robot
Contract manufacturing	SL Corp	Includes battery pack

Note: The target is to sell 10,000 to 15,000 units over the next three years.

Source: HMC, Samsung Securities

For Korean suppliers that have already entered the US market alongside HMC, securing a reference customer such as Boston Dynamics could open the door to additional business opportunities. As noted earlier, every major US technology company is now investing in robotics, while the US is increasingly likely to restrict Chinese participation in its robotics supply chain, much as it has in the EV sector.

In Mar 2026, Senator Tom Cotton (R-Arkansas) and Senator Chuck Schumer (D-New York) jointly introduced the American Security Robotics Act of 2026. The bill aims to protect US data privacy and prevent adversarial nations—including China, Russia, North Korea, and Iran—from embedding robotic technologies into critical US infrastructure and national-security systems, thereby preserving the US's technological edge.

The proposed regulation covers: 1) system-level robots, including unmanned ground vehicles, autonomous patrol systems, mobile robots, and humanoids; 2) critical components, including not only finished robots but also key subsystems such as cameras, sensors, and controllers that enable data collection and control; and 3) covered entities, including companies headquartered in adversarial nations—or subject to their ownership, control, or significant influence—as well as their subsidiaries.

The bill is expected to move through the Senate Committee on Homeland Security and Governmental Affairs by late Mar 2026, attract bipartisan support, and be enacted in 2H, with implementation targeted for early 2027. Separately, the US administration is expected to announce targeted incentives for robotics manufacturing, similar to those provided under the Inflation Reduction Act (IRA). If production tax credits are extended to core components such as actuators, Hyundai Mobis and HL Mando stand to benefit significantly.

Comparison of Security Robotics Legislation, Drone Regulations, and the Inflation Reduction Act (IRA)

Aspect	Security Robotics Bill	Drone Regulations	IRA (Inflation Reduction Act)
Implementation	Expected to be introduced in Mar 2026; implementation anticipated in 2027	Implemented in 2024	Implemented in Aug 2024
Primary targets	Chinese and Russian-made humanoids and UGVs (Unmanned ground vehicles)	Chinese-made small and commercial drones (eg, DJI)	Electric vehicles containing Chinese batteries and critical minerals
Incentive approach	No incentives — pure regulatory restriction	Indirect support: Subsidies funded by customs revenue; large-scale procurement contracts with domestic firms (eg, Anduril)	Direct financial support: Consumer tax credits, production tax credits, and manufacturing subsidies
Production location requirements	Nationality-based: Manufacturer's country of origin is more important than production location	Component-level regulation: Mandatory phased US localization of parts	Final assembly must occur in North America; key minerals must originate from approved sources
Impact on Korean companies	Expanded export opportunities for finished products and components	Benefits for small drone components and defense-grade drone suppliers	Mandatory local factory investment in North America; eligibility for government subsidies

Source: Congress.Gov, Samsung Securities

Major countries' policy support: EVs vs robotics

	EVs	Robotics
US	<ul style="list-style-type: none"> • USD30.7b in total support through the <i>Inflation Reduction Act</i> • USD7,500 subsidy for EVs manufactured in the US, set to end on Sep 30, 2025 	<ul style="list-style-type: none"> • Focus on AI infrastructure and robot intelligence development • USD500b allocated (including to projects like StarGate) • Reviewing a robotics executive order
China	<ul style="list-style-type: none"> • USD230.9b cumulative support over 15 years—subsidies for vehicle replacement and NEV purchases 	<ul style="list-style-type: none"> • Estimated investment in the tens of billions of yuan • Part of the 'Made in China 2025' extension • Creation of a robot fund worth around KRW1.8t in Shanghai alone
Germany	<ul style="list-style-type: none"> • EUR3b total (policy reintroduced in 2026) • Up to EUR6,000 subsidy for low-income / multi-child households 	<ul style="list-style-type: none"> • n/a
Korea	<ul style="list-style-type: none"> • KRW1.6t in 2026 • Reduction in per-unit subsidy amounts, but beneficiaries expanded to 300,000 units 	<ul style="list-style-type: none"> • Budget of around KRW1.1t (Industrial AI transformation and robotics) • KRW157.5b newly allocated for commercialization of AI applications (including robots) • Includes KRW150t in financial support over five years under the "advanced strategic industry" policy
Japan	<ul style="list-style-type: none"> • n/a 	<ul style="list-style-type: none"> • Approximately JPY200b annually (KRW1.8t) • 2026 budget increase under the 'New Robot Strategy' • Support for physical AI and next-generation robot semiconductors

Source: Media, Samsung Securities

Appendix: 2026 automotive demand update

Global demand to shrink y-y for the first time in four years

In late 2025, our research team projected that global automotive demand would reach 89m units in 2026 (up 3.5% y-y), supported by fiscal stimulus measures across major economies and wealth effects from rising asset prices. However, the unexpected outbreak of conflict in the Middle East in late February disrupted this outlook. The resulting surge in commodity prices dampened expectations for interest-rate cuts and further eroded vehicle affordability. Demand in the Middle East has declined sharply in the wake of the conflict. We now forecast global automotive demand at 81m units in 2026, representing a 7% y-y decline. The contraction is expected to be concentrated in internal combustion engine (ICE) vehicles, prompting structural adjustments among traditional automakers.

China: EV demand, previously the primary driver of market growth, plunged 21% y-y to 4.1m units in 1Q26, driven by reduced government subsidies and the reintroduction of EV purchase taxes. However, demand is expected to recover gradually following the Beijing Auto Show in April, supported by new model launches and intensified marketing campaigns. Full-year demand is now projected at 20.1m units (down 13% y-y).

US: Demand declined 5.5% y-y to 3.7m units in 1Q26, largely due to a base effect from tariff-related front-loading in 1H25. This effect is expected to persist through May, keeping 1H demand subdued. The average five-year auto-loan rate has risen to 7%, nearly double its level of three years ago. A meaningful recovery in demand likely requires lower financing costs. Full-year demand is forecast at 15.5m units (down 5% y-y).

Europe: Demand is expected to grow 2% y-y to 16.9m units in 2026. Supportive EV subsidy policies introduced in key markets—including Germany, France, and the UK—since late 2025 continue to drive adoption. With EV penetration having exceeded 30% in 2025, European demand is helping offset the slowdown in China.

Korea: Korea is expected to record a second consecutive year of demand recovery in 2026, driven by: 1) the extension through 1H26 of the temporary reduction in the individual consumption tax on vehicles—from 5% to 2.5%—introduced in 2025; and 2) improving consumer sentiment fueled by rising asset prices. Growth is being led by EV sales, supported by competitively priced models from Tesla and Kia.

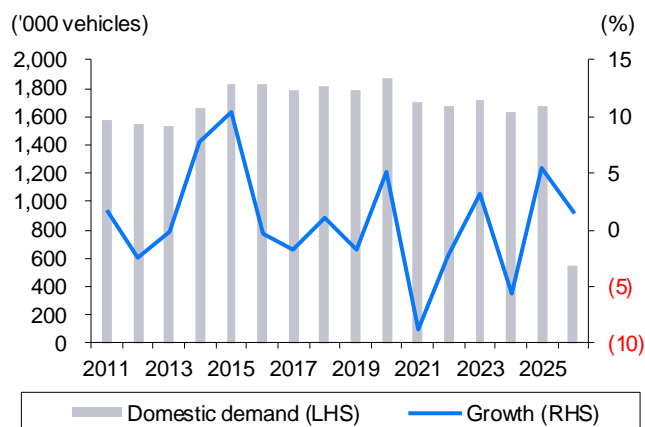
India: Following the removal of the additional levy under the goods and services tax (GST) regime for vehicles on Sep 22, 2025, India simplified its vehicle-tax structure, reducing applicable tax rates across segments by 3-11%pts. Supported by this change and a wave of model launches, demand is projected to rise 13% y-y in 2026.

Global auto demand trends and forecasts

('000 vehicles)	1Q25	2Q25	3Q25	4Q25	1Q26	2Q26	3Q26	4Q26	2023	2024	2025	2026E	2026E chg (% y-y)
China	5,233	5,713	6,069	7,077	4,089	5,713	6,069	8,221	22,200	22,585	24,092	20,960	-13.0
US	3,927	4,212	4,155	4,066	3,710	4,212	4,155	4,283	15,980	16,043	16,360	15,542	-5.0
Europe	4,137	4,222	3,781	4,470	4,098	4,222	3,781	4,509	15,916	16,352	16,610	16,942	2.0
Korea	390	438	402	455	409	438	402	450	1,723	1,633	1,685	1,786	6.0
India	1,177	1,029	1,061	1,298	1,332	1,132	1,167	934	4,350	4,320	4,565	5,158	13.0
Brazil	518	614	659	759	599	650	699	805	2,180	2,370	2,549	2,753	8.0
Other	5,338	5,108	5,270	5,918	4,985	4,328	6,194	6,127	21,352	21,414	21,635	18,229	-15.7
Total	20,720	21,336	21,397	24,043	19,222	20,696	22,467	25,111	83,701	84,717	87,496	81,371	-7.0
Chg (% y-y)	1.8	3.2	4.0	0.2	(7.2)	(3.0)	5.0	4.4	10.1	1.2	3.3	(7.0)	

Source: Automotive Associations, Hyundai Motor, Samsung Securities estimates

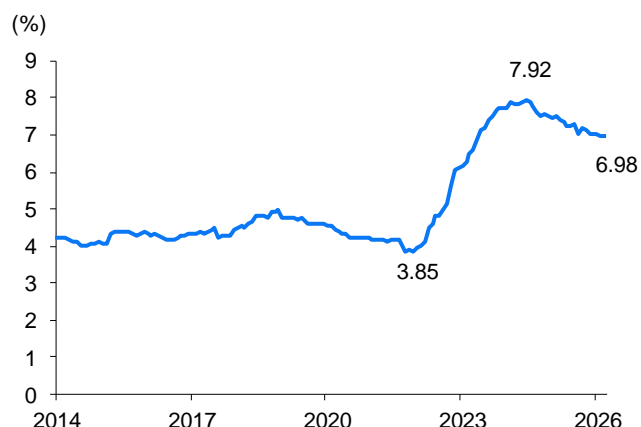
Korea: Auto demand



Note: *As of Apr 2026

Source: KAMA, Samsung Securities

US: Rates on 60-month loans for new cars (monthly data)



Source: Statista, Samsung Securities

India: Goods & service tax (GST) reduction

Category	Definition	Old (%)			New (%)	Total rate chg (%pts)
		GST	Cess	Total tax rate	GST	
Small car/SUV	Length ≤ 4 m Engine capacity ≤1200 cc (petrol) or ≤1500 cc (diesel)	28	1	29	18	-11
Medium-sized car	Length > 4 m Engine capacity ≤1500 cc	28	15	43	40	-3
Large car/SUV	Length >4 m Engine capacity > 1500 cc or luxury imported cars	28	17-22	45-50	40	-5~-10
EV	BEV	5	0	5	5	0

Source: Media, Samsung Securities

Global auto demand expanding—excluding the US

Rising oil prices, driven by prolonged conflict in the Middle East, have accelerated the shift toward EVs. Powertrain performance varied by region from 2023 through early 2026, but the global market has now largely pivoted toward EVs—except in the US. Global EV demand is projected to reach 23.5m units in 2026 (up 9.6% y-y), with penetration reaching 29%, implying that nearly one in three new vehicles sold will be electric. In the US, demand is expected to recover from September, supported by broader adoption of autonomous-driving technologies.

Global EV (BEV+PHEV) demand forecasts

('000 units)	2021	2022	2023	2024	2025	Chg (%, %pts y-y)	2026E		
							EV-volumes	Samsung	Chg (%, %pts y-y)
China	3,396	6,180	8,389	11,518	13,619	18.2	15,975	14,300	5.0
Europe	2,346	2,703	3,164	3,090	4,072	31.8	4,620	4,886	20.0
US	668	1,123	1,450	1,574	1,535	-2.5	1,445	1,382	-10.0
Korea	115	172	174	150	239	59.3	NA	358	50.0
Other	278	385	1,034	1,474	2,035	38.1	3,063	2,646	30.0
Other	6,803	10,563	14,211	17,806	21,500	20.7	25,103	23,572	9.6
Total	9.0	14.0	17.0	21.2	24.6	3.6	28.2	29.0	4.4

Source: EV-Volumes, Samsung Securities

Global auto demand forecasts, by powertrain

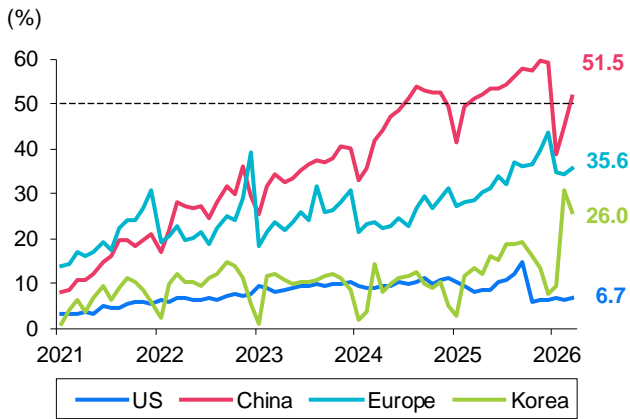
('000 units)	2020	2021	2022	2023	2024	2025	2026E	Chg (% y-y)
Total	74,294	75,696	75,997	83,701	84,050	87,496	81,371	-7.0
ICE	71,948	72,993	72,833	69,507	66,881	65,996	57,799	-12.4
EV	2,346	2,703	3,164	14,194	17,169	21,500	23,572	9.6
Penetration (%)	3.2	3.6	4.2	17.0	20.4	24.6	29.0	4.4

Source: EV-Volumes, Samsung Securities

Global EV demand totaled 4m units in 1Q26 (down 6.9% y-y), primarily due to a sharp contraction in China. China's EV market, which accounted for 60% of global demand in 2025, sold just 1.9m units in 1Q26 (down 27% y-y). Over the past two years, the market expanded rapidly to 12.8m units annually, fueled by the vehicle trade-in subsidy program. In 2026, however, demand has softened due to a combination of a high base—following a surge in purchases ahead of subsidy cuts—and the actual reduction in incentives. The subsidy was lowered from CNY20,000 to 12% of the vehicle price (capped at CNY15,000), while purchase tax, which had been set at 0% since 2014, was reinstated at 5%. For a vehicle priced at CNY200,000, this translates into an effective price increase of 7.5%.

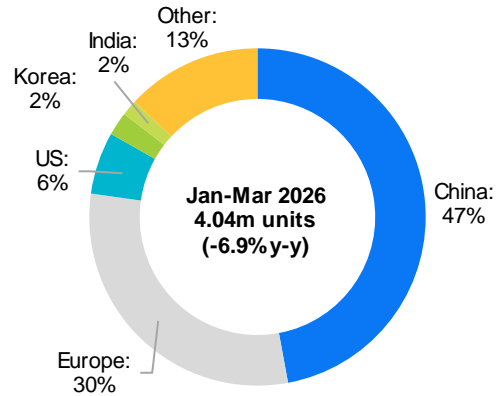
The picture changes, however, when exports are taken into account. Since domestic demand began slowing in 2H25, China's EV exports have surged by more than 100% y-y, supporting overall sales growth. Excluding the US and India—markets that remain largely inaccessible to Chinese EV makers—Chinese vehicles are gaining market share across nearly every major economy.

EV penetration, by country and region



Source: EV-Volumes, Samsung Securities

Global EV demand portion, by country

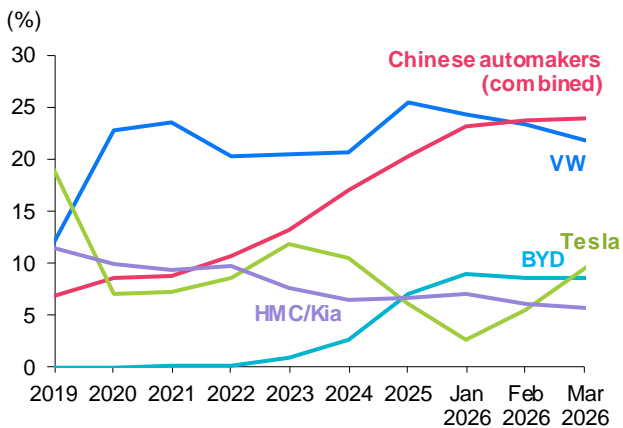


Source: EV-Volumes, Samsung Securities

While EV demand in China has plateaued, Europe has emerged as the primary engine of global growth. Key markets—including Germany, the UK, and France—reinstated EV subsidies in 2H25, reigniting consumer demand. In 1Q26, European EV sales expanded 30.2% y-y to 1.23m units. EV penetration reached 35%, and Europe’s share of global EV sales rose to 30%.

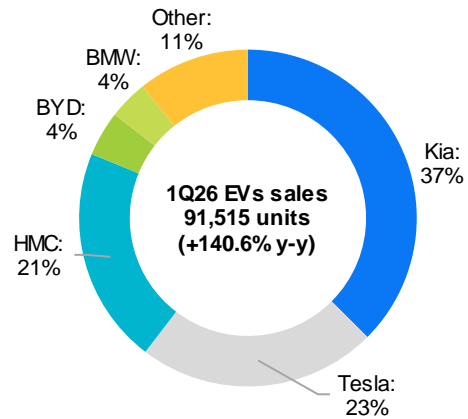
In Korea, EV demand surged 141% y-y to 92,000 units in 1Q26. Tesla was the primary driver of this growth. EV penetration rose to 30%, supported by strong Tesla sales and BYD’s entry into the market.

Major automakers: European market shares



Source: EV-Volumes, Samsung Securities

Major automakers: Korean EV market shares



Source: EV-Volumes, Samsung Securities

COMPANY UPDATE

2026. 5. 29

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▶ AT A GLANCE

BUY

Target price **KRW900,000** **32.9%**

Current price **KRW677,000**

Market cap KRW138.6t/USD92.3b

Shares (float) 204,757,766 (65.6%)

52-week high/low KRW712,000/KRW184,000

Avg daily trading value (60-day) KRW951.6b/USD633.9m

▶ ONE-YEAR PERFORMANCE

	1M	6M	12M
Hyundai Motor (%)	22.0	158.9	264.2
Vs Kospi (%pts)	-1.0	24.2	18.8

▶ KEY CHANGES

(KRW)	New	Old	Diff
Recommend.	BUY	BUY	
Target price	900,000	800,000	12.5%
2026E EPS	42,451	41,942	1.2%
2027E EPS	46,495	46,021	1.0%

▶ SAMSUNG vs THE STREET

No of estimates	26
Target price	727,692
Recommendation	4.0

※ Rating: 4 < → BUY, 3 = HOLD, 2 > → SELL



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Hyundai Motor (005380)

2H outlook; in essence, a Physical AI ETF

- Toyota announced a 4QFY26 (fiscal year ends in March) earnings shock, and as a result Hyundai Motor (HMC) is increasingly being seen as the only global automaker with the scale and technological depth to compete with Tesla in the Physical AI era.
- Over the past 25 years, HMC has shouldered more than half of Hyundai Motor Group's (HMG) capital investments. As its subsidiaries are now recording strong earnings and stable cash flows, HMC's financial burden is easing, bringing its own equity value into sharper focus.
- All of its key subsidiaries operate in Physical AI-related fields. In essence, HMC functions like an ETF—its key subsidiaries are leading Physical AI players in multiple Physical AI-related domains.

WHAT'S THE STORY?

Top pick—raising target price 12.5% to KRW900,000: Toyota's (the world's top-selling automaker) 1Q earnings shock is reshaping expectations towards: 1) HMG's robotics business; and 2) the likely winners in the Physical AI era.

- **Increasing target P/E 13.8% to 20.5x:** Our new target price of KRW900,000 is derived by applying 20.5x P/E to its average 2026-2027 EPS. The target multiple is based on the 12-month forward average P/E of four leading Chinese EV makers (BYD, Li Auto, Xiaomi, Geely; excluding Nio, given its losses). Since CES 2026, HMC's valuation has been benchmarking Chinese frontrunners.

While these Chinese competitors have commercialized Level 2+ autonomous technologies (ahead of HMC), they continue to rely on external partners for core AI inference models and chips. We view these Chinese EV makers' technical capabilities as being similar to HMC/Kia's—they possess no decisive advantage.

(Continued on the next page)

SUMMARY FINANCIAL DATA

	2025	2026E	2027E	2028E
Revenue (KRWb)	186,254	197,265	209,074	218,444
Operating profit (KRWb)	11,468	12,401	13,677	15,084
Net profit (adj) (KRWb)	10,365	11,615	12,721	13,921
EPS (adj) (KRW)	35,331	42,451	46,495	50,880
EPS (adj) growth (% y-y)	-23.3	20.2	9.5	9.4
EBITDA margin (%)	8.9	8.9	9.0	9.3
ROE (%)	8.4	9.4	9.5	9.7
P/E (adj) (x)	8.4	15.9	14.6	13.3
P/B (x)	0.7	1.4	1.3	1.2
EV/EBITDA (x)	14.4	18.6	17.6	16.3
Dividend yield (%)	3.4	1.6	1.8	1.8

Source: Company data, Samsung Securities estimates

- **Toyota's earnings shock coincides with Atlas' commercialization timeline:** Toyota's 4QFY26 results (fiscal year ends in March) showed a 49% y-y decline in operating profit, missing consensus by 30%. Its operating margin fell to 4.5%, 1%pt below HMC's. The Japanese carmaker's FY27 guidance has its operating profit plunging 20% to JPY3t, for an operating margin of just 5.9%—its lowest in 25 years. The troubling 1Q results and downbeat FY27 forecasts underscore the fact that even the world's largest automaker cannot remain competitive with hybrid technology alone.
- **Emerging oligopoly in the Physical AI era:** The auto industry, due to its vast upstream and downstream employment figures, has historically been heavily managed by governments and never allowed to become an oligopoly. As a result, even the global top carmaker has limited pricing power, leading to low profitability and compressed valuations. But in the Physical AI era, just 2 or 3 companies—with the capital and talent to build end-to-end AI ecosystems—are likely to dominate. In the West, following Tesla, HMC and Kia (combined) stand out as the strongest candidates.
- **HMC's subsidiary value coming into focus:** HMC has borne over half of the costs associated with vertical integration and new business investments by HMG over the past 25 years. Today, most of its subsidiaries are generating strong earnings and healthy cash flows, reducing HMC's financial strain. At the same time, these subsidiaries are leaders in Physical AI-driven industries. As HMG advances its core AI technologies, the enterprise value of its affiliates is rising.

Operation of RMAC from 3Q26—starting point of the physical AI era: We forecast HMC/Kia's combined market cap will exceed Toyota's in 2027.

- **HMC/Kia's plants generate the real-world data needed to train robots:** Robots first train in RMAC, mastering factory layouts, movement paths, and task sequences in simulations. This virtual training data are then fused with live operational data from HMC/Kia's smart digital factory (SDF) systems. The objective is to create a self-improving feedback loop: Virtual training → real-world feedback → model refinement.
- **RMAC's ownership structure:** Beyond HMG, Google and Nvidia are likely to take a stake in RMAC. The two US firms need high-quality, real-world robotic behavior data to train next-generation foundation models. Both also operate data centers (which are essential for robot training) and inference chip-based businesses. Through RMAC, HMC and Kia could sell high-value robotic datasets not just to Google and Nvidia, but also to other US tech giants.
- **RMAC's value:** Like Scale AI (in which Meta bought a 49% stake), RMAC could monetize its data. Selling data to multiple enterprise clients could result in RMAC being valued at USD29b—21% of HMC/Kia's combined market cap. Assuming revenue of USD72/hour per robot-training unit, RMAC's value could rise to USD65b, nearly 49% of HMC/Kia's combined market cap.
- **RMAC's sales and earnings:** RMAC's revenue is projected to reach USD0.034b in 2027 and USD2.7b in 2030, driven by improvements in data quality and greater customization (enhancing operational efficiency). Its operating margin should top 50%, translating to USD2.7b in operating profit (KRW4t) in 2030—equivalent to 19% of HMC/Kia's combined 2025 operating profit.
- **Don't focus on valuation—focus on where the money is flowing:** In 2020, Tesla sold just 0.5m vehicles and posted a net profit of USD700m—only one-twentieth of Toyota's. Yet, the US

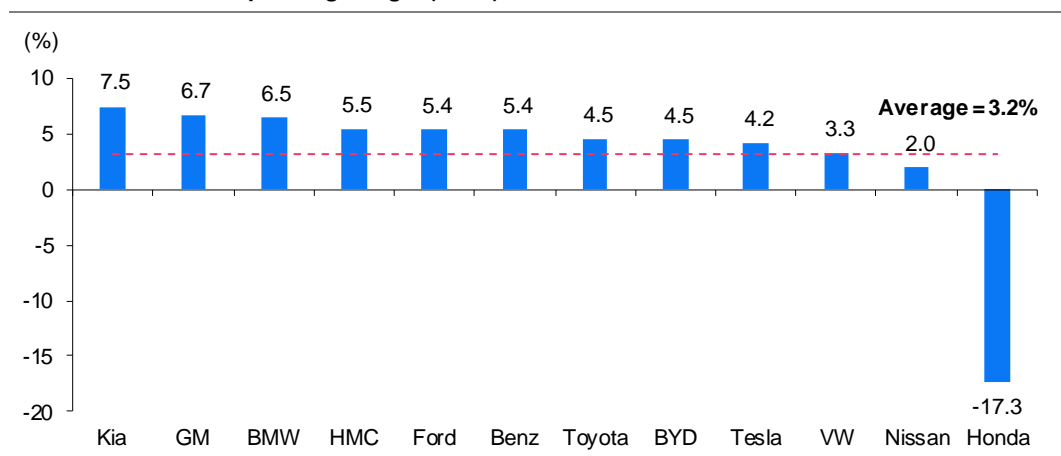
carmaker's market cap surpassed the Japanese player's in Jul 2020, just months after having launched the Model Y (March).

In 2H26, HMG is set to launch RMAC and set up Robotics America. If these moves gain traction, HMC/Kia's combined market cap could overtake Toyota's next year. Such a feat would be the market's acknowledgment that the Physical AI era has officially begun.

Profit recovery expected in 2H: Earnings in 2Q should continue to face headwinds from engine valve supply disruptions and rising raw-material costs. HMC's operating profit should rebound to KRW3t in 2Q.

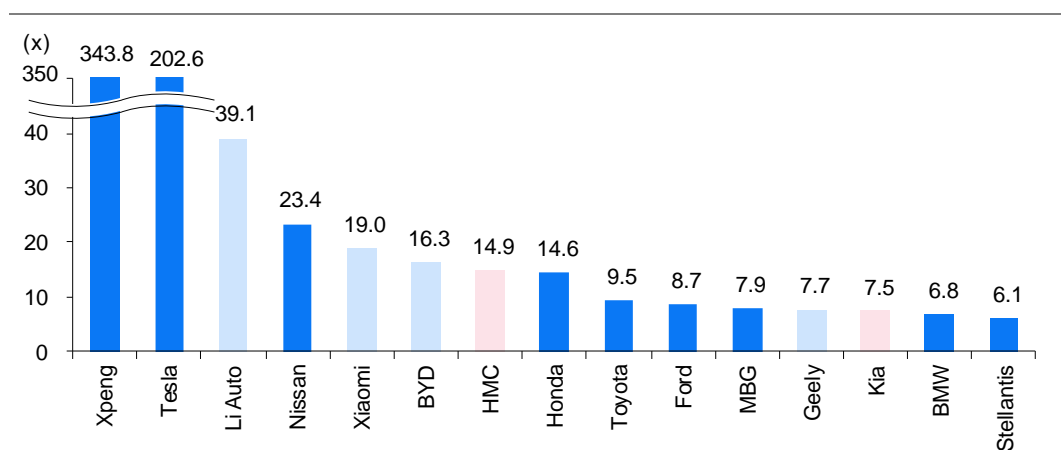
- **Impact of fire at engine valve supplier:** A fire in March has disrupted HMG's engine production. Alternative components are being evaluated with a view to securing quality validation. Replacement sourcing should begin in 2Q, with full production ramp-ups of these alternative parts expected to happen in 2H, minimizing the full-year impact of the fire on HMG.
- **Raw-material costs:** HMC's raw-material costs are set to rise KRW200b y-y in 2Q.
- **New-model launches in 2H:** HMC in 2H is expected to roll out: 1) new versions of the Avante and Tucson in both ICE and hybrid variants; as 2) a Genesis hybrid.

Global automakers: Operating margin (1Q26)



Source: Bloomberg, Samsung Securities

Global automakers: 12-month-forward P/E



Source: Bloomberg, Samsung Securities

Hyundai Motor: Subsidiary equity value

Physical AI category	Subsidiary	Ownership (%)	Book value (KRWb)	Market cap* (KRWb)	Market cap × Ownership × NAV discount** (KRWb)	Notes
Robotics	Boston Dynamics***	27.97	469			Kia's ownership: 17.23%
	Robotics LAB	55				Kia's ownership: 45%
	RMAC	TBD				Operations to commence in 2H26
	Robotics America	TBD				To be established in 2H26
SI, Robot control	Hyundai AutoEver	31.59	572	17,606	3,893	Kia's ownership: 16.24%
Autonomous driving / Robotics	Kia	35.17	21,679	65,238	16,061	
Defense / Unmanned defense	Hyundai Rotem	33.77	891	23,411	5,534	
Nuclear power / Data Centers	Hyundai Construction	20.95	3,195	16,914	2,480	Kia's ownership: 5.24%
Finance	Hyundai Capital	59.72	4,553			Kia's ownership: 40.13%
	Hyundai Card	36.96	1,587			Kia's ownership: 6.48%
Total			32,945		27,969	

Note: * As of May 26, ** 30% of NAV discount is applied, *** Includes HMG Global's stake in Boston Dynamics.

Bold entries are consolidated subsidiaries; others are accounted for under the equity method.

Source: Hyundai Motor, Samsung Securities

HMG (Big 3): Cash flow and net cash position

(KRWb)	2021	2022	2023	2024	2025
Hyundai Motor*	11,928	14,819	16,888	18,978	12,749
Kia	7,360	9,333	11,297	12,564	9,054
Mobis	2,609	2,154	5,343	4,253	4,473
Operating cash flow	21,896	26,307	33,527	35,795	26,276
Capex + equity investments	-7,571	-11,625	-15,742	-18,375	-19,514
Dividends	-2,051	-2,926	-4,269	-6,514	-5,841
Treasury stock buybacks	0	0	-650	-1,563	-1,972
Total cash outflows	-9,622	-14,551	-20,662	-26,452	-27,327
Net cash flow	12,274	11,756	12,866	9,343	-1,051
Net cash position	27,363	30,412	40,698	43,583	40,045

Note: Hyundai Motor figures exclude financial segment operating cash flow and net cash.
Source: Company reports, Samsung Securities

Data types required for robot AI model training

Data type	Components	Characteristics
Internet data	Text, images, video	Abundant but lacks physical action data
Synthetic data	Simulation trajectories, virtual environments	Low-cost but limited sim-to-real transfer
Real-world action data	Joint torque, force/tactile sensors, RGB video, multi-axis motion	Scarce, high cost, and high quality

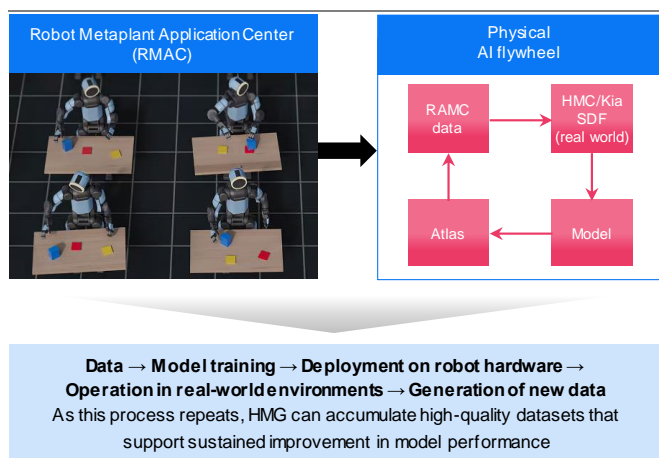
Source: Nvidia GR00T N1 paper, Samsung Securities

Real-world data: High value, high cost



Source: Nvidia GR00T N1 paper, Silicon Valley Robotics Center, Samsung Securities

HMG: Physical AI flywheel



Source: Samsung Securities

Metaplant: Collaborative robots working alongside humans on an assembly line



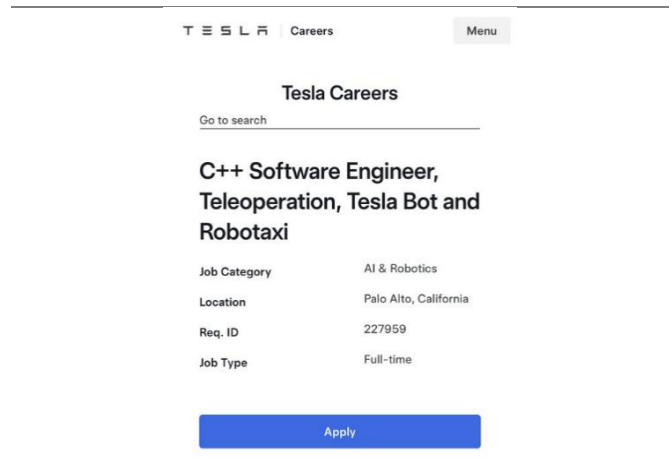
Source: HMC

Tesla Optimus: Learning via teleoperation



Source: X

Tesla: Teleoperation job posting (USD48/hr)



Source: Company data

RMAC data value projection

	Units deployed (cumulative units)	Annual data hours (‘000 hours)	Annual data value (USDm)	KRW equivalent (USDb)
2026 proof of concept stage	10	50	4	5.2
2027 early stage	500	2,500	180	261
2028 mass-production	5,000	25,000	1,800	2,610
2030 expansion	30,000	150,000	10,800	15,660

Note: Exchange rate applied: KRW1,450/USD.

Source: Samsung Securities

Data value generated by human workers at Metaplant

	Number of workers	Annual data hours (‘000 hours)	Annual data value (USDm)	KRW equivalent (USDb)
2027	1,100	2,200	158	230
2028	1,100	2,200	158	230
2030	1,500	3,000	216	313

Source: Samsung Securities

HMC/Kia: Robot data business profitability forecasts

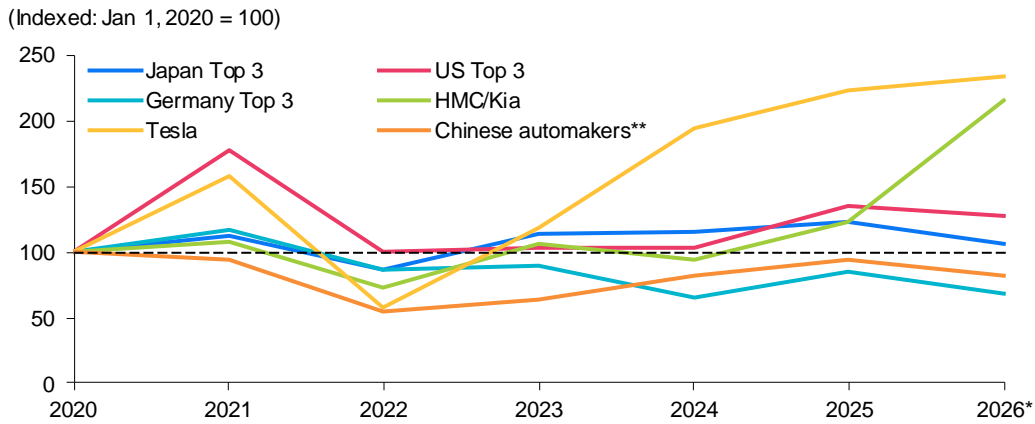
	Annual data value (RMAC + Overseas plants)	External sales ratio (%)	Revenue (USDm)	Operating profit* (USDm)	Net profit** (USDm)
2026	4	0	n/a	n/a	n/a
2027	338	10	34	17	13
2028	1,958	30	588	294	232
2030	11,016	50	5,508	2,754	2,176

Note: *Assumes operating margin of 50%;

**Assumes corporate tax rate of 21%

Source: Samsung Securities

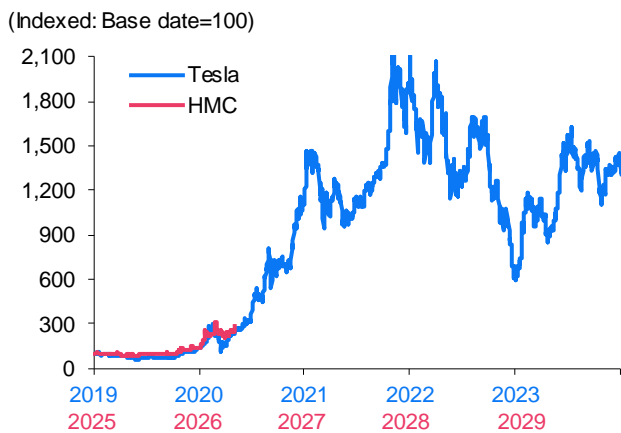
Global automakers: Market cap trend since the pandemic



Note: Chinese EV manufacturers — BYD, Xiaomi, NIO, XPeng, Li Auto
* As of end-May 2026

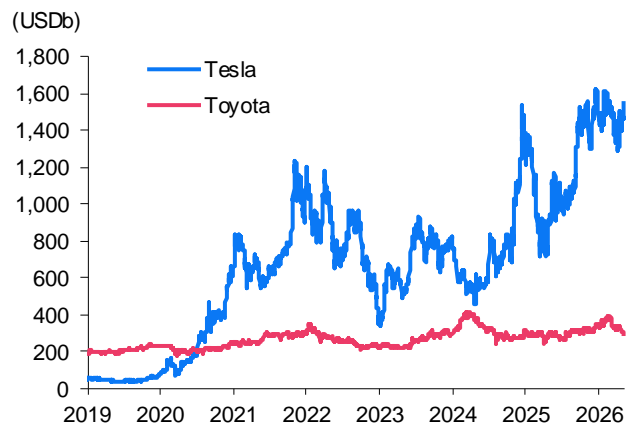
Sources: Bloomberg, Samsung Securities

Market cap: HMC vs Tesla



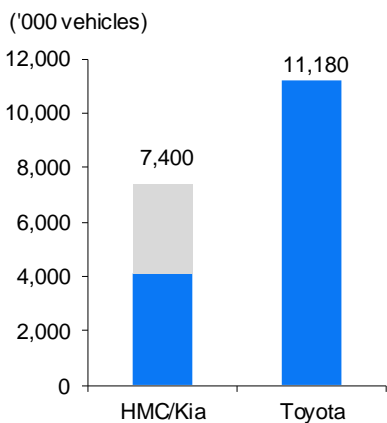
Source: Bloomberg, Samsung Securities

Market cap: Tesla vs Toyota



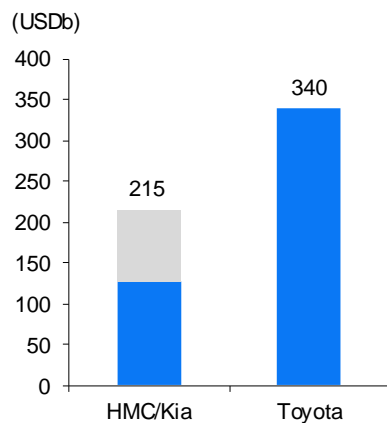
Source: Bloomberg, Samsung Securities

Global sales volume: HMG vs Toyota (2026)



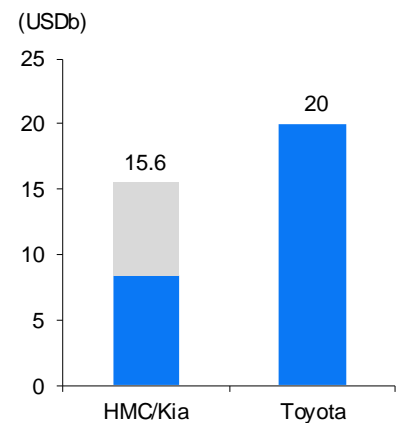
Note: HMC/Kia figures are Samsung Securities estimates; Toyota figures are FY27 guidance
Source: Company data, Samsung Securities.

Consolidated sales: HMG vs Toyota (2026)



Note: HMC/Kia figures are Samsung Securities estimates; Toyota figures are FY27 guidance
Source: Company data, Samsung Securities.

Operating profit: HMG vs Toyota (2026)



Note: HMC/Kia figures are Samsung Securities estimates; Toyota figures are FY27 guidance
Source: Company data, Samsung Securities.

HMC: Global sales volume and forecasts

('000 vehicles)	1Q25	2Q25	3Q25	4Q25	1Q26	2Q26E	3Q26E	4Q26E	2024	2025	2026E	2027E
Global plant sales	1,006	1,063	1,022	1,021	984	1,058	1,031	1,074	4,174	4,111	4,119	4,294
Domestic	445	483	458	454	440	474	434	452	1,871	1,840	1,800	1,810
Overseas	561	580	563	567	543	583	597	622	2,303	2,271	2,319	2,484
India (HMI)	192	180	191	195	208	209	212	190	764	758	820	850
China (BHMC)	44	50	47	53	43	52	45	60	170	194	200	210
US (HMMA)	98	112	108	105	99	116	122	113	361	422	450	500
Turkey (HAOS)	62	59	39	38	39	54	46	71	246	198	210	210
Czech (HMMC)	73	74	67	63	68	86	75	91	327	277	320	330
Russia (HMMR)	0	0	0	0	0	0	0	0	0	0	40	100
Brazil (HMMB)	41	55	54	63	44	49	55	56	214	213	205	205
Global retail sales	1,001	1,066	1,038	1,033	976	1,058	1,058	1,022	4,142	4,138	4,115	4,255
Global ASP (KRWm)	35.7	36.3	36.5	36.7	36.4	38.5	38.8	39.8	34.1	36.3	38.4	39.4

Source: Company data, Samsung Securities

HMC: Results and forecasts

(KRWb)	1Q25	2Q25	3Q25	4Q25	1Q26	2Q26E	3Q26E	4Q26E	2024	2025	2026E	2027E
KRW/USD (avg)	1,453	1,401	1,387	1,452	1,467	1,450	1,430	1,420	1,365	1,423	1,442	1,390
Revenue	44,408	48,287	46,721	46,839	45,939	51,446	50,370	49,510	175,231	186,254	197,265	209,074
Autos	34,718	37,609	36,715	36,590	34,538	39,536	39,976	38,965	136,725	145,632	153,015	162,299
Finance	7,398	8,214	7,189	7,432	8,992	9,446	7,549	7,874	28,447	30,233	33,861	35,554
Other	2,292	2,464	2,818	2,817	2,409	2,464	2,846	2,671	10,060	10,390	10,390	11,221
Gross profit	8,980	9,110	8,284	7,843	8,017	9,493	9,523	8,445	35,749	34,217	35,477	37,891
Operating profit	3,634	3,602	2,537	1,695	2,515	3,812	3,821	2,253	14,240	11,468	12,401	13,677
Pre-tax profit	4,465	4,385	3,326	1,666	3,522	4,899	4,512	2,561	17,490	13,842	15,544	16,961
Net profit	3,382	3,250	2,548	1,184	2,585	3,674	3,384	1,921	13,230	10,365	11,615	12,721
Controlling profit	3,157	2,998	2,261	1,029	2,335	3,564	3,283	1,863	12,527	9,446	11,266	12,339
Margins (%)												
Gross profit	20.2	18.9	17.7	16.7	17.5	18.5	18.9	17.1	20.4	18.4	18.0	18.1
Operating profit	8.2	7.5	5.4	3.6	5.5	7.4	7.6	4.6	8.1	6.2	6.3	6.5
Net profit	7.6	6.7	5.5	2.5	5.6	7.1	6.7	3.9	7.5	5.6	5.9	6.1
Controlling profit	7.1	6.2	4.8	2.2	5.1	6.9	6.5	3.8	7.1	5.1	5.6	5.9

Source: Company data, Samsung Securities

Income statement

Year-end Dec 31 (KRWb)	2024	2025	2026E	2027E	2028E
Sales	175,231	186,254	197,265	209,074	218,444
Cost of goods sold	139,482	152,038	161,788	171,183	178,481
Gross profit	35,749	34,217	35,477	37,891	39,963
Gross margin (%)	20.4	18.4	18.0	18.1	18.3
SG&A expenses	21,510	22,749	23,077	24,215	24,879
Operating profit	14,240	11,468	12,401	13,677	15,084
Operating margin (%)	8.1	6.2	6.3	6.5	6.9
Non-operating gains (losses)	3,251	2,374	3,143	3,284	3,477
Financial profit	1,531	1,299	903	829	852
Financial costs	899	1,010	599	599	611
Equity-method gains (losses)	3,114	2,510	2,883	3,088	3,240
Other	-496	-425	-44	-33	-5
Pre-tax profit	17,490	13,842	15,544	16,961	18,561
Taxes	4,232	3,477	3,929	4,240	4,640
Effective tax rate (%)	24.2	25.1	25.3	25.0	25.0
Profit from continuing operations	13,549	10,365	11,615	12,721	13,921
Profit from discontinued operations	-319	0	0	0	0
Net profit	13,230	10,365	11,615	12,721	13,921
Net margin (%)	7.5	5.6	5.9	6.1	6.4
Net profit (controlling interests)	12,527	9,446	11,266	12,339	13,503
Net profit (non-controlling interests)	703	919	348	382	418
EBITDA	18,527	16,484	17,538	18,920	20,296
EBITDA margin (%)	10.6	8.9	8.9	9.0	9.3
EPS (parent-based) (KRW)	46,042	35,331	42,451	46,495	50,880
EPS (consolidated) (KRW)	48,626	38,767	43,764	47,933	52,453
Adjusted EPS (KRW)*	46,042	35,331	42,451	46,495	50,880

Cash flow statement

Year-end Dec 31 (KRWb)	2024	2025	2026E	2027E	2028E
Cash flow from operations	-5,662	-5,991	17,573	19,124	18,681
Net profit	13,230	10,365	11,615	12,721	13,921
Non-cash profit and expenses	23,950	25,920	4,847	5,133	5,338
Depreciation	3,398	3,745	3,901	4,038	4,033
Amortization	889	1,272	1,236	1,206	1,179
Other	19,663	20,904	-290	-110	126
Changes in A/L from operating activities	-35,160	-34,325	3,704	4,248	2,789
Cash flow from investments	-14,623	-10,347	-13,761	-13,381	-12,977
Change in tangible assets	-7,890	-8,121	-6,000	-5,000	-4,000
Change in financial assets	-1,842	2,832	-472	-463	-368
Other	-4,891	-5,059	-7,289	-7,918	-8,610
Cash flow from financing	19,493	15,425	-5,861	639	372
Change in debt	32,090	18,624	-3,237	3,526	3,520
Change in equity	3,278	124	0	0	0
Dividends	-3,913	-3,689	-2,624	-2,886	-3,148
Other	-11,961	366	0	0	0
Change in cash	-152	-654	-10,831	-3,498	7,023
Cash at beginning of year	19,167	19,015	18,361	7,530	4,032
Cash at end of year	19,015	18,361	7,530	4,032	11,055
Gross cash flow	37,180	36,285	16,462	17,854	19,259
Free cash flow	-13,723	-14,358	11,573	14,124	14,681

Note: *Excluding one-off items

**Fully diluted, excluding one-off items

***From companies subject to equity-method valuation

Source: Company data, Samsung Securities estimates

Balance sheet

Year-end Dec 31 (KRWb)	2024	2025	2026E	2027E	2028E
Current assets	115,764	120,777	112,574	111,893	120,994
Cash & equivalents	19,015	18,361	7,530	4,032	11,055
Accounts receivable	5,908	8,600	9,109	9,654	10,040
Inventories	19,791	20,662	21,883	23,193	24,121
Other current assets	71,050	73,155	74,052	75,014	75,777
Fixed assets	224,034	248,067	268,522	289,233	298,978
Investment assets	117,804	124,261	136,564	149,600	151,948
Tangible assets	44,534	48,750	50,849	51,811	51,778
Intangible assets	7,683	9,268	9,032	8,826	8,647
Other long-term assets	54,014	65,789	72,078	78,996	86,605
Total assets	339,798	368,845	381,095	401,126	419,972
Current liabilities	79,510	88,579	86,311	91,269	95,236
Accounts payable	12,550	12,287	13,014	13,793	14,411
Short-term debt	9,327	10,388	10,388	10,388	10,388
Other current liabilities	57,633	65,904	62,909	67,088	70,437
Long-term liabilities	140,013	152,617	157,611	162,849	166,955
Bonds & long-term debt	120,420	131,240	134,240	137,240	140,240
Other long-term liabilities	19,593	21,377	23,370	25,609	26,715
Total liabilities	219,522	241,197	243,922	254,118	262,191
Owners of parent equity	109,103	115,447	124,623	134,076	144,431
Capital stock	1,489	1,489	1,489	1,489	1,489
Capital surplus	7,656	7,780	7,780	7,780	7,780
Retained earnings	96,596	101,312	109,954	119,407	129,762
Other	3,362	4,865	5,400	5,400	5,400
Non-controlling interests' equity	11,173	12,202	12,550	12,932	13,349
Total equity	120,276	127,648	137,173	147,008	157,781
Net debt	130,142	152,127	159,353	165,982	162,166

Financial ratios

Year-end Dec 31	2024	2025	2026E	2027E	2028E
Growth (%)					
Sales	7.7	6.3	5.9	6.0	4.5
Operating profit	-5.9	-19.5	8.1	10.3	10.3
Net profit	7.8	-21.7	12.1	9.5	9.4
Adjusted EPS**	5.6	-23.3	20.2	9.5	9.4
Per-share data (KRW)					
EPS (parent-based)	46,042	35,331	42,451	46,495	50,880
EPS (consolidated)	48,626	38,767	43,764	47,933	52,453
Adjusted EPS**	46,042	35,331	42,451	46,495	50,880
BVPS	413,568	439,541	475,962	512,066	551,614
DPS (common)	12,000	10,000	11,000	12,000	12,000
Valuations (x)					
P/E***	4.6	8.4	15.9	14.6	13.3
P/B***	0.5	0.7	1.4	1.3	1.2
EV/EBITDA	10.5	14.4	18.6	17.6	16.3
Ratios (%)					
ROE	12.4	8.4	9.4	9.5	9.7
ROA	4.3	2.9	3.1	3.3	3.4
ROIC	12.3	7.8	7.5	7.9	8.3
Payout ratio	19.5	21.4	19.8	19.7	18.0
Dividend yield (common)	5.7	3.4	1.6	1.8	1.8
Net debt to equity	108.2	119.2	116.2	112.9	102.8
Interest coverage (x)	31.5	20.0	20.7	22.8	24.7

COMPANY UPDATE

2026. 5. 29

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▶ AT A GLANCE

BUY

Target price **KRW230,000** 40%

Current price **KRW164,300**

Market cap	KRW64.1t/USD42.7b
Shares (float)	390,412,998 (60.4%)
52-week high/low	KRW206,000/KRW88,400
Avg daily trading value (60-day)	KRW238.9b/ USD158.9m

▶ ONE-YEAR PERFORMANCE

	1M	6M	12M
Kia (%)	5.6	44.0	84.6
Vs Kospi (%pts)	-14.3	-30.9	-39.8

▶ KEY CHANGES

(KRW)	New	Old	Diff
Recommend.	BUY	BUY	
Target price	230,000	230,000	0.0%
2026E EPS	22,700	22,700	0.0%
2027E EPS	24,071	24,071	0.0%

▶ SAMSUNG vs THE STREET

No of estimates	25
Target price	222,600
Recommendation	4.0

※ Rating: 4 ← → BUY, 3 = HOLD, 2 → → SELL



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Kia (000270)

2H outlook: To lead HMG's earnings recovery

- Among Hyundai Motor Group's three flagship companies—Hyundai Motor (HMC), Kia, and Hyundai Mobis—Kia has shown the least alignment with robotics momentum, which owes to its smaller equity stakes in robotics and key subsidiaries compared to HMC.
- With the launch of the Telluride and Seltos and production of the Sportage Hybrid in the US, and the rollout of the EV2 in Europe, Kia should show a clear earnings recovery from 2Q—earlier than HMC does.
- If the valuation gap with HMC widens, Kia's position as the most profitable player in the global mobility industry, coupled with its appeal as an undervalued play, would likely draw greater attention.

WHAT'S THE STORY?

Undervaluation appeal: While a valuation gap with Hyundai Motor (HMC) is inevitable due to differences in asset value, Kia remains an attractive stock given its strong earnings, shareholder returns, and robotics momentum.

- **Trading at half HMC's valuation...** HMC is trading at 14.9x forward P/E, while Kia is trading at just 7.5x. This disparity stems from: 1) Kia's lower equity stakes in robotics assets—HMC owns 27% of Boston Dynamics vs Kia's 18%, and HMC has a 55% stake in Robotics Lab vs Kia's vs 45%; 2) unequal ownership of key subsidiaries, many of which are undergoing revaluation; 3) retail investor concentration on HMC; and 4) ETFs heavily weighted toward HMC.
- **...and valuation gap reflects long-term market dynamics...** Since CES 2026, Hyundai Motor Group's key affiliates have rerated for being leaders in physical AI. What is particularly noteworthy is that HMC holds the largest equity stakes in key subsidiaries, including the robotics ones.

(Continued on the next page)

SUMMARY FINANCIAL DATA

	2025	2026E	2027E	2028E
Revenue (KRWb)	114,141	125,987	130,351	135,592
Operating profit (KRWb)	9,078	10,441	10,961	11,514
Net profit (adj) (KRWb)	7,554	8,862	9,398	10,004
EPS (adj) (KRW)	19,111	22,700	24,071	25,625
EPS (adj) growth (% y-y)	-21.7	18.8	6.0	6.5
EBITDA margin (%)	10.3	10.4	10.3	10.2
ROE (%)	12.9	13.8	13.3	12.9
P/E (adj) (x)	6.4	7.2	6.8	6.4
P/B (x)	0.8	0.9	0.9	0.8
EV/EBITDA (x)	2.4	3.0	2.4	1.8
Dividend yield (%)	5.6	4.3	4.6	4.6

Source: Company data, Samsung Securities estimates

- **... but undervaluation is clear:** Despite this, Kia is delivering the highest profitability in the global mobility sector, with robust operating cash flows and rising cash reserves. We strongly expect the valuation gap with HMC to narrow.

The only global growth story in autos: As the “second EV wave” begins, Kia has fully lined up its product portfolio around mid-range and low-priced EVs.

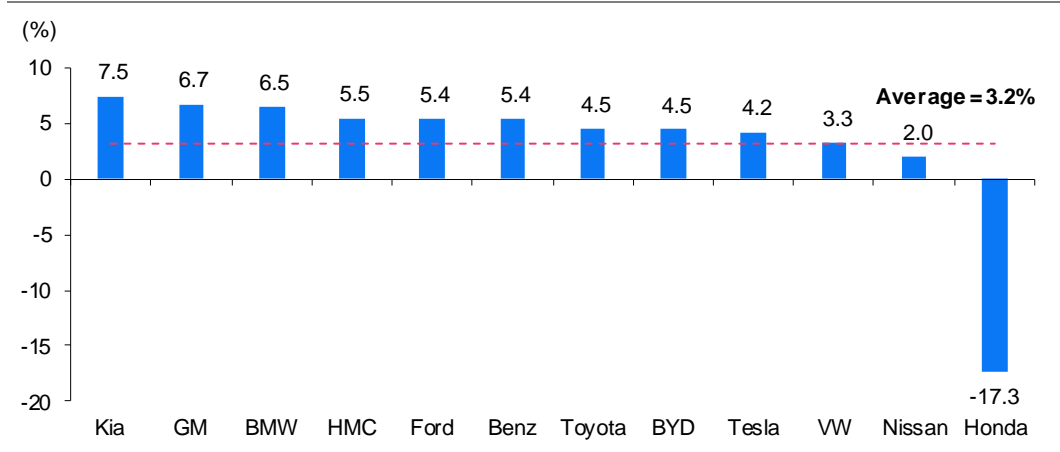
- **Clear earnings growth candidate:** Kia is targeting 3.35m wholesale sales in 2026 (up 6.8% y-y), suggesting it is poised to be the only major automaker with y-y sales volume growth. For the full year, it expects to post sales of KRW122.3t (up 7.2% y-y) and an operating profit of KRW10.2t, for an operating margin of 8.3%. With HMG assuming an exchange rate of KRW1,370/USD and an operating profit sensitivity of KRW300b-350b per KRW10 change in the exchange rate, upside surprises remain likely.
- **Strong financials:** Despite 2025 being the toughest operating environment since the pandemic, Kia maintained positive free cash flow (KRW430b) and a net cash position of KRW19.6t (up KRW897b y-y), equivalent to 33% of its market cap. By comparison, HMC’s net cash (excluding financial subsidiaries) stood at KRW12t. Supported by solid earnings and financials, Kia’s shareholder return policy continues to target a total payout ratio of 35%. Moreover, as investments in data centers, robotics training facilities, and robot manufacturing plants ramp up, Kia’s share of these strategic capital expenditures is expected to grow—signaling its greater involvement in these businesses.

Clear earnings recovery ahead in 2Q: Kia is maintaining strong sales momentum in Korea. It is also seeing new-model effects in the US and Europe.

- **Korea—demand in recovery:** Korean auto demand bounced back 6.6% y-y in 1Q. Kia’s sales volume increased 5.3% y-y to 142,000 units. Tesla’s sales volume surged 335% y-y to 20,000 units, and Kia’s EV sales also jumped 190% y-y to 34,000 units, supported by the full launch of its EV lineup.
- **US—new-model effects starting to click:** Kia rolled out ICE and HEV variants of the Telluride (February) and Seltos (April), while production of the Sportage Hybrid began at the Hyundai Motor Group Metaplant America in late April. We expect Kia’s US wholesales to rise 15% q-q to 236,000 units in 2Q.
- **Europe—full EV lineup in place:** Following the launch of the PV5 (purpose-built vehicle) in late 2025, the EV2 rolled out in late-Mar 2026, priced below EUR30,000. Now with five models in lineup—the EV2, EV3, EV4, EV5, and PV5—Kia is well-positioned to ride the wave of growing European demand for EVs.
- **Weaker won to offset raw material cost pressure:** Rising raw material prices would add approximately KRW50b to annual costs. Kia’s operating profit is sensitive to KRW/USD movements, with each KRW10 fluctuation in the exchange rate affecting profits by 3.5-4.0%. The exchange rate is KRW100 above the KRW1,370/USD assumed in its business plan.
- **Impact of fire at engine valve supplier:** A fire at a supplier of engine valves resulted in 20,000 units of lost production at Kia in April. Higher EV output partially offset the impact, resulting in a net production loss of 10,000 units. Production disruptions should cease in May, as components will be sourced from alternative suppliers.

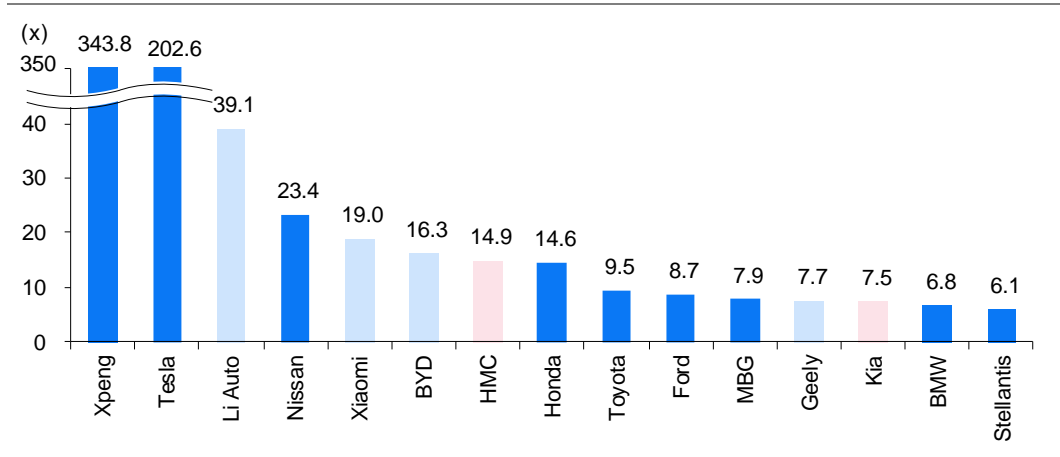
- **2Q preview—results to top consensus:** We expect Kia to post 2Q sales of KRW32.1t (up 9% q-q and 9.5% y-y) and operating profit of KRW2.95t (up 33.9% q-q and 6.8% y-y), for an operating margin of 9.2%. Consensus (FnGuide) puts 2Q sales at KRW31.6t and operating profit at KRW2.75t, for an operating margin of 8.7%.

Global automakers: Operating margin (1Q26)



Source: Bloomberg, Samsung Securities

Global automakers: 12-month-forward P/E



Source: Bloomberg, Samsung Securities

Hyundai Motor: Subsidiary equity value

Physical AI category	Subsidiary	Stake (%)	Book value (KRWb)	Market cap* (KRWb)	Market cap × stake × NAV discount** (KRWb)	Notes
Robotics	Boston Dynamics***	27.97	469			Kia's ownership: 17.23%
	Robotics Lab	55				Kia's ownership: 45%
	RMAC	TBD				Operations to commence in 2H26
	Robotics America	TBD				To be established in 2H26
SI, Robot control	Hyundai AutoEver	31.59	572	17,606	3,893	Kia's ownership: 16.24%
Autonomous driving/Robotics	Kia	35.17	21,679	65,238	16,061	
Defense/Unmanned defense	Hyundai Rotem	33.77	891	23,411	5,534	
Nuclear power/Data centers	Hyundai Construction	20.95	3,195	16,914	2,480	Kia's ownership: 5.24%
Finance	Hyundai Capital	59.72	4,553			Kia's ownership: 40.13%
	Hyundai Card	36.96	1,587			Kia's ownership: 6.48%
Total			32,945		27,969	

Note: *As of May 26;

**30% NAV discount applied;

***Includes HMG Global's stake in Boston Dynamics;

Bold entries are consolidated subsidiaries; others are accounted for under the equity method.

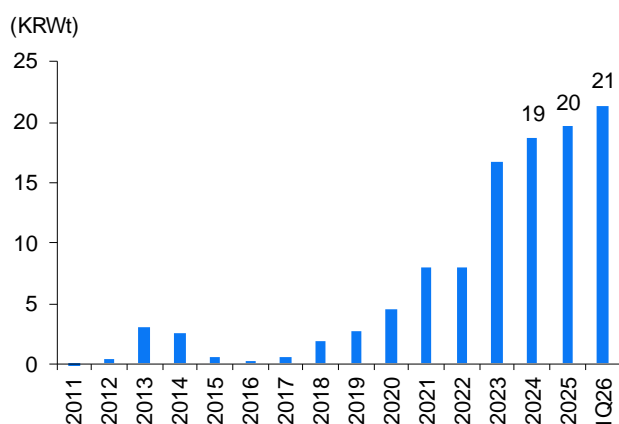
Source: Company data, Samsung Securities

Telluride profitability analysis

	Telluride 1st gen	Telluride 2nd gen
Selling price (USD)	46,453	55,743
Wholesale price (USD)	41,807	50,169
Sales volume (units)	127,000	177,000
Revenue (USDm)	5,309	8,880
Profitability (%)	20%	22%
Operating profit (USDm)	1,062	1,954
Operating profit (KRWb)	1,529	2,813

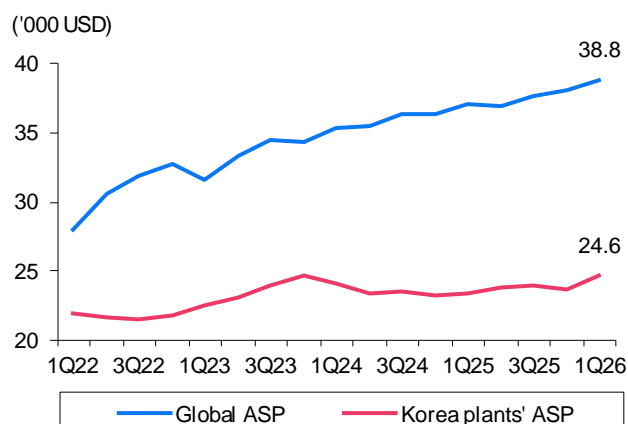
Source: Samsung Securities estimates

Kia: Net cash



Source: Company data, Samsung Securities

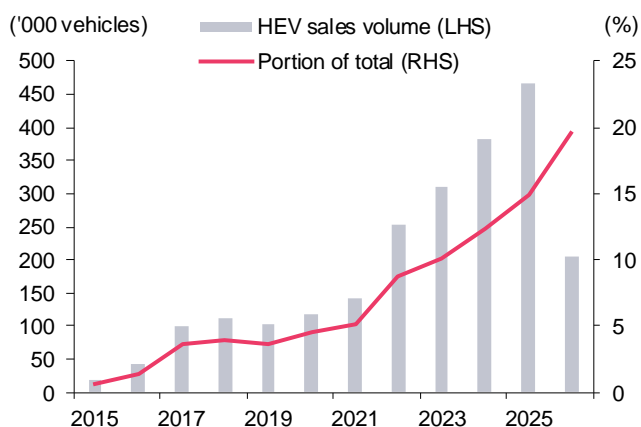
Kia: ASP trends



Note: Korea plant ASP includes domestics and exports

Source: Company data, Samsung Securities

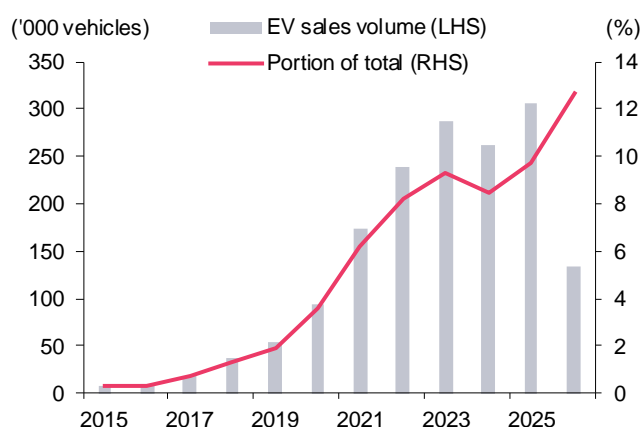
Kia: Hybrid sales volume



Note: As of Apr 2026

Source: Company data, Samsung Securities

Kia: EV sales volume



Note: As of Apr 2026

Source: Company data, Samsung Securities

Kia: Global sales volume and forecasts

('000 vehicles)	1Q25	2Q25	3Q25	4Q25	1Q26	2Q26E	3Q26E	4Q26E	2024	2025	2026E	2027E
Global plant sales	776	808	758	742	780	841	837	831	3,044	3,083	3,290	3,440
Domestic	394	417	397	379	404	412	397	396	1,547	1,587	1,610	1,620
Overseas	382	391	360	363	376	429	440	435	1,496	1,496	1,680	1,820
US (KMMG)	88	91	88	84	87	105	114	103	352	352	410	460
Europe (KMS)	89	86	64	56	73	98	90	98	351	295	360	380
China (DYK)	57	67	63	67	50	60	68	73	248	254	250	250
Mexico (KMM)	68	74	73	74	76	78	81	75	274	288	310	350
India (KMI)	81	73	72	82	90	87	87	86	270	307	350	380
Global retail sales	772	814	784	761	779	846	827	851	3,083	3,130	3,290	3,400
Global ASP (KRWm)	37.2	37.0	37.6	38.0	38.8	38.6	38.7	40.2	35.8	37.4	39.2	39.3

Source: Company data, Samsung Securities estimates

Kia: Results and forecasts

(KRWb)	1Q25	2Q25	3Q25	4Q25	1Q26	2Q26E	3Q26E	4Q26E	2024	2025	2026E	2027E
KRW/USD (avg)	1,453	1,401	1,387	1,452	1,467	1,450	1,430	1,420	1,365	1,423	1,442	1,390
Revenue	28,018	29,350	28,686	28,088	29,502	31,876	31,232	33,378	107,449	114,141	125,987	130,351
Gross profit	6,081	5,875	5,409	5,143	5,804	6,188	5,719	6,298	24,771	22,508	24,008	24,414
Operating profit	3,009	2,765	1,462	1,843	2,205	2,887	2,452	2,897	12,667	9,078	10,441	10,961
Pre-tax profit	3,243	3,000	1,887	2,111	2,635	3,125	3,101	3,277	13,500	10,241	12,138	12,700
Net profit	2,393	2,268	1,422	1,471	1,830	2,312	2,295	2,425	9,775	7,554	8,862	9,398
Controlling profit	2,393	2,269	1,425	1,474	1,831	2,312	2,295	2,425	9,773	7,561	8,862	9,398
Margins (%)												
Gross profit	21.7	20.0	18.9	18.3	19.7	19.4	18.3	18.9	23.1	19.7	19.1	18.7
Operating profit	10.7	9.4	5.1	6.6	7.5	9.1	7.9	8.7	11.8	8.0	8.3	8.4
Net profit	8.5	7.7	5.0	5.2	6.2	7.3	7.3	7.3	9.1	6.6	7.0	7.2
Controlling profit	8.5	7.7	5.0	5.2	6.2	7.3	7.3	7.3	9.1	6.6	7.0	7.2

Source: Company data, Samsung Securities estimates

Income statement

Year-end Dec 31 (KRWb)	2024	2025	2026E	2027E	2028E
Sales	107,449	114,141	125,987	130,351	135,592
Cost of goods sold	82,678	91,633	101,979	105,936	109,798
Gross profit	24,771	22,508	24,008	24,414	25,794
Gross margin (%)	23.1	19.7	19.1	18.7	19.0
SG&A expenses	12,104	13,430	13,567	13,453	14,280
Operating profit	12,667	9,078	10,441	10,961	11,514
Operating margin (%)	11.8	8.0	8.3	8.4	8.5
Non-operating gains (losses)	833	1,163	1,697	1,738	1,825
Financial profit	1,351	1,300	1,046	1,287	1,595
Financial costs	610	578	51	38	38
Equity-method gains (losses)	395	415	927	968	1,017
Other	-304	26	-225	-479	-749
Pre-tax profit	13,500	10,241	12,138	12,700	13,339
Taxes	3,725	2,687	3,276	3,302	3,335
Effective tax rate (%)	27.6	26.2	27.0	26.0	25.0
Profit from continuing operations	9,775	7,554	8,862	9,398	10,004
Profit from discontinued operations	0	0	0	0	0
Net profit	9,775	7,554	8,862	9,398	10,004
Net margin (%)	9.1	6.6	7.0	7.2	7.4
Net profit (controlling interests)	9,773	7,561	8,862	9,398	10,004
Net profit (non-controlling interests)	2	-7	0	0	0
EBITDA	15,216	11,792	13,068	13,438	13,860
EBITDA margin (%)	14.2	10.3	10.4	10.3	10.2
EPS (parent-based) (KRW)	24,413	19,111	22,700	24,071	25,625
EPS (consolidated) (KRW)	24,418	19,094	22,700	24,071	25,625
Adjusted EPS (KRW)*	24,413	19,111	22,700	24,071	25,625

Cash flow statement

Year-end Dec 31 (KRWb)	2024	2025	2026E	2027E	2028E
Cash flow from operations	12,564	9,054	11,896	11,397	11,924
Net profit	9,775	7,554	8,862	9,398	10,004
Non-cash profit and expenses	9,666	8,455	3,788	3,368	2,914
Depreciation	2,010	2,070	2,060	1,977	1,906
Amortization	540	644	567	500	440
Other	7,116	5,741	1,161	891	568
Changes in A/L from operating activities	-4,287	-4,328	1,333	491	590
Cash flow from investments	-10,153	-4,960	-3,040	-1,883	-1,960
Change in tangible assets	-3,424	-3,593	-2,000	-1,500	-1,500
Change in financial assets	-4,788	-1,940	-1,040	-383	-460
Other	-1,941	573	-0	0	0
Cash flow from financing	-3,570	-4,175	-3,789	-2,718	-2,912
Change in debt	-525	-887	-1,146	3	3
Change in equity	2	11	0	0	0
Dividends	-2,194	-2,559	-2,642	-2,721	-2,915
Other	-853	-740	0	0	0
Change in cash	-787	432	3,332	6,800	6,910
Cash at beginning of year	14,353	13,567	13,998	17,331	24,130
Cash at end of year	13,567	13,998	17,331	24,130	31,040
Gross cash flow	19,441	16,009	12,650	12,765	12,918
Free cash flow	9,079	5,290	9,896	9,897	10,424

Note: *Excluding one-off items;

**Fully diluted, excluding one-off items;

***From companies subject to equity-method valuation

Source: Company data, Samsung Securities estimates

Balance sheet

Year-end Dec 31 (KRWb)	2024	2025	2026E	2027E	2028E
Current assets	41,797	44,426	50,883	58,833	67,125
Cash & equivalents	13,567	13,998	17,331	24,130	31,040
Accounts receivable	3,561	3,552	3,920	4,056	4,219
Inventories	12,419	14,666	16,188	16,749	17,422
Other current assets	12,251	12,210	13,444	13,898	14,444
Fixed assets	50,958	54,553	56,764	56,833	57,242
Investment assets	27,223	28,149	30,987	32,033	33,288
Tangible assets	17,928	19,934	19,875	19,398	18,992
Intangible assets	4,094	4,806	4,238	3,738	3,298
Other long-term assets	1,713	1,664	1,664	1,664	1,664
Total assets	92,756	98,979	107,647	115,667	124,368
Current liabilities	26,977	28,378	30,028	31,061	32,301
Accounts payable	10,455	10,662	11,769	12,176	12,666
Short-term debt	221	211	211	211	211
Other current liabilities	16,302	17,505	18,048	18,673	19,424
Long-term liabilities	9,938	9,410	10,250	10,560	10,931
Bonds & long-term debt	2,176	979	979	979	979
Other long-term liabilities	7,763	8,431	9,271	9,581	9,952
Total liabilities	36,916	37,789	40,279	41,621	43,233
Owners of parent equity	55,831	61,188	67,366	74,043	81,133
Capital stock	2,139	2,139	2,139	2,139	2,139
Capital surplus	1,760	1,771	1,771	1,771	1,771
Retained earnings	50,241	54,520	60,740	67,417	74,506
Other	1,691	2,758	2,716	2,716	2,716
Non-controlling interests' equity	9	3	3	3	3
Total equity	55,840	61,190	67,369	74,046	81,135
Net debt	-15,303	-19,162	-24,462	-31,562	-38,832

Financial ratios

Year-end Dec 31	2024	2025	2026E	2027E	2028E
Growth (%)					
Sales	7.7	6.2	10.4	3.5	4.0
Operating profit	9.1	-28.3	15.0	5.0	5.0
Net profit	11.4	-22.7	17.3	6.0	6.5
Adjusted EPS**	12.1	-21.7	18.8	6.0	6.5
Per-share data (KRW)					
EPS (parent-based)	24,413	19,111	22,700	24,071	25,625
EPS (consolidated)	24,418	19,094	22,700	24,071	25,625
Adjusted EPS**	24,413	19,111	22,700	24,071	25,625
BVPS	141,812	157,456	173,331	190,511	208,751
DPS (common)	6,500	6,800	7,000	7,500	7,500
Valuations (x)					
P/E***	4.1	6.4	7.2	6.8	6.4
P/B***	0.7	0.8	0.9	0.9	0.8
EV/EBITDA	1.6	2.4	3.0	2.4	1.8
Ratios (%)					
ROE	19.1	12.9	13.8	13.3	12.9
ROA	11.3	7.9	8.6	8.4	8.3
ROIC	45.2	27.3	29.0	31.7	34.9
Payout ratio	26.2	34.9	30.7	31.0	29.1
Dividend yield (common)	6.5	5.6	4.3	4.6	4.6
Net debt to equity	-27.4	-31.3	-36.3	-42.6	-47.9
Interest coverage (x)	124.8	120.8	203.8	290.0	304.1

COMPANY UPDATE

2026. 5. 29

EV/Mobility Team

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▶ AT A GLANCE

BUY

Target price KRW950,000 38.5%

Current price KRW686,000

Market cap	KRW62.2t/USD41.4b
Shares (float)	89,602,640 (65.2%)
52-week high/low	KRW688,000/KRW246,500
Avg daily trading value (60-day)	KRW268.6b/ USD178.9m

▶ ONE-YEAR PERFORMANCE

	1M	6M	12M
Hyundai Mobis (%)	53.5	121.6	170.1
Vs Kospi (%pts)	24.5	6.3	-11.9

▶ KEY CHANGES

(KRW)	New	Old	Diff
Recommend.	BUY	BUY	
Target price	950,000	720,000	31.9%
2026E EPS	47,711	47,469	0.5%
2027E EPS	55,283	55,027	0.5%

▶ SAMSUNG vs THE STREET

No of estimates	25
Target price	632,400
Recommendation	4.0

※ Rating: 4 < → BUY, 3 = HOLD, 2 > → SELL



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Hyundai Mobis (012330)

2H outlook: Robotics fever puts spotlight on actuator tech

- The key bottleneck in humanoid robot hardware today is not dexterity, but thermal management.
- Effective thermal control depends on air-cooled designs, in which actuators and capacitors play central roles. Actuator manufacturers are responsible for thermal isolation and low-friction engineering.
- Atlas's commercialization strategy centers on compatibility with the automotive supply chain. Hyundai Mobis, already a key player in this ecosystem, is now expanding its role into thermal management. The company is our top pick for 2H.

WHAT'S THE STORY?

Raising target price by 32% to KRW950,000: Actuators supplied by Hyundai Mobis account for 50-60% of a humanoid robot's hardware cost and serve as critical components in thermal management.

- **Applying a target P/E of 18.4x, in line with Hanon Systems' historical average:** We previously valued Hyundai Mobis using a blend of P/E and P/B. To better reflect its expanded role in robotics, we now apply P/E alone. We raise our target P/E by 34.3% from 13.7x (the upper end of the firm's historical range) to 18.4x and apply this to the average of our EPS forecasts for 2026 and 2027 to derive a target price of KRW950,000. The 18.4x multiple reflects Hanon Systems' average P/E from Apr 2016, when Tesla's Model 3 kicked off the EV wave, to 2024, before Hanon Systems fell into losses. As a key thermal management supplier for EVs, Hanon Systems historically commanded a valuation premium. Hyundai Mobis will supply 100% of the actuators for Atlas and is also expanding into thermal management.

SUMMARY FINANCIAL DATA

(Continued on the next page)

(KRWb)	2025	2026E	2027E	2028E
Revenue	61,118	65,144	68,938	72,997
Operating profit	3,357	3,920	4,627	5,194
Net profit (adj)	3,665	4,314	4,962	5,466
EPS (adj) (KRW)	39,682	47,711	55,283	60,898
EPS (adj) growth (% y-y)	-8.7	20.2	15.9	10.2
EBITDA margin (%)	7.4	8.0	8.7	9.1
ROE (%)	7.7	8.4	9.0	9.1
P/E (adj) (x)	9.4	14.4	12.4	11.3
P/B (x)	0.7	1.1	1.0	1.0
EV/EBITDA (x)	7.2	11.5	9.6	8.3
Dividend yield (%)	1.7	0.9	1.1	1.2

Source: Company data, Samsung Securities estimates

- **Humanoid robots' key hardware challenge—thermal management:** Heat is generated mainly by joint actuators. Individually, the heat load is modest, but it becomes meaningful under continuous 24/7 operation. Given cable-free designs and tight spatial constraints, liquid cooling is not feasible. Effective thermal control therefore depends on air-cooled architectures, careful material selection, and the thermal performance of actuators and capacitors.

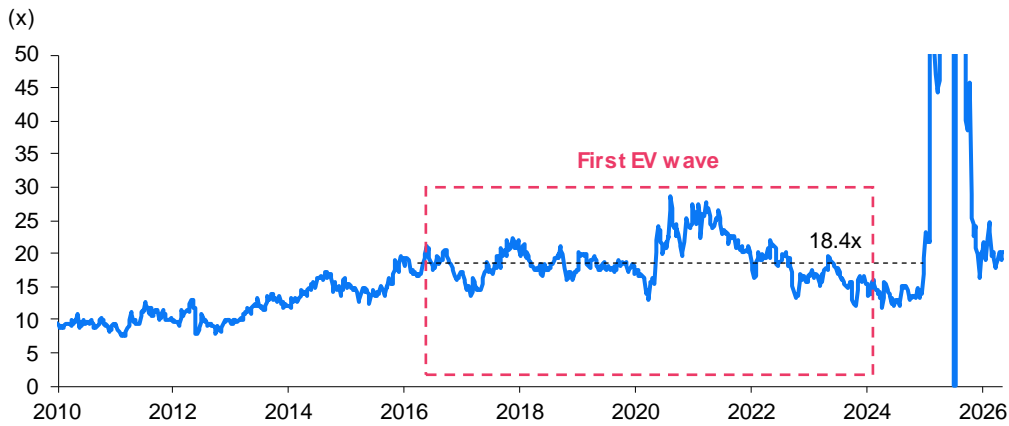
Role of actuator manufacturers in thermal management: Actuator makers are responsible for thermal isolation and low-friction engineering.

- **Separating gear heat from motor heat:** Frictional heat from meshing planetary and cycloidal gears can combine with electrical heat from the motor, leading to magnet demagnetization and torque loss. Actuator makers mitigate this risk by applying advanced low-friction coatings, such as diamond-like carbon (DLC), to gear surfaces.
- **Integrating thermal interface materials (TIMs):** At the assembly stage, manufacturers such as Hyundai Mobis embed high-conductivity thermal pads or gels to accelerate heat transfer from motor windings to external cooling fins.
- **Optimizing power semiconductors:** Replacing conventional silicon MOSFETs with gallium nitride (GaN) components in motor drivers increases switching speed by 10-100x, substantially reducing overall heat generation.

Atlas's core design principle—compatibility with the automotive supply chain: The same technologies and manufacturing processes used in Hyundai Mobis's automotive components are applied directly to Atlas actuators. This minimizes R&D investment, enables the reuse of existing production lines, and supports profitability from the earliest stages of volume production.

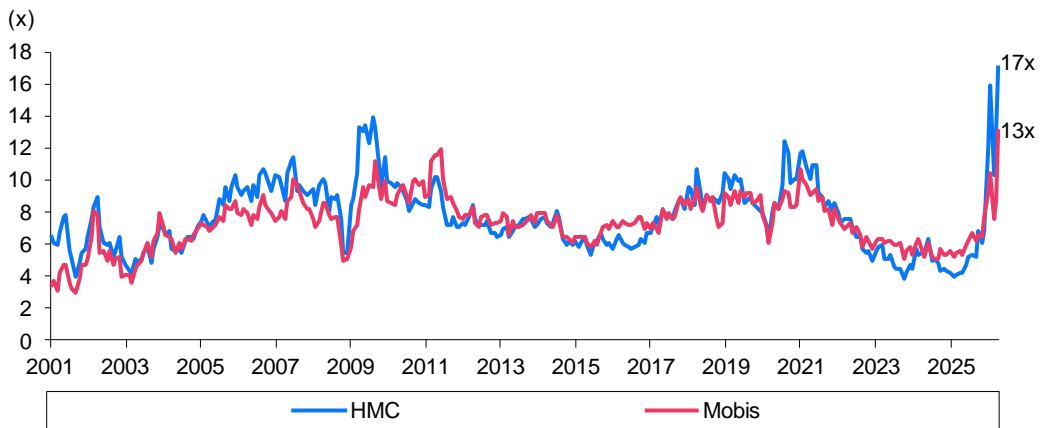
- **Mobis participates in Atlas production design:** Automotive parts typically weigh more than 15 kg, while Atlas's maximum payload is 45 kg. The key challenge is withstanding impact loads during movement. For high-stress zones—the hips and waist—Hyundai Mobis employs a hybrid planetary-cycloidal gear system. For the knees and ankles, which absorb ground impact, planetary gears are used for their shock-damping properties.
- **Planetary gears—a mature automotive technology:** Planetary gears are widely used in automatic transmissions, EV reduction gears, electric power steering, and hybrid power-split systems.
- **Scalable production:** Hyundai Mobis can ramp up actuator gear production without new greenfield investment, as its existing CNC hobbing, grinding, and heat-treatment lines, originally designed for automotive gears, are directly adaptable to robot actuator manufacturing.

Hanon Systems: Valuation premium as a thermal management company amid the EV wave



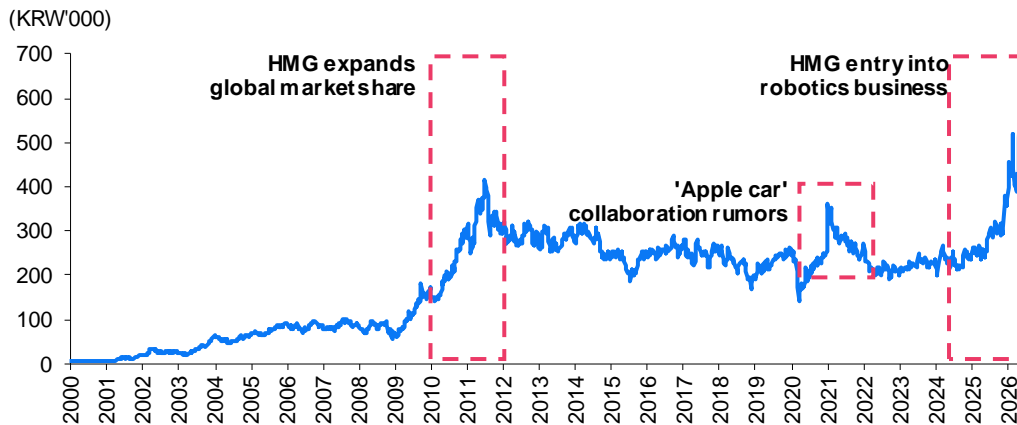
Source: Bloomberg, Samsung Securities

Hyundai Motor vs Hyundai Mobis: 12-month forward P/E valuation



Source: QuantiWise, Samsung Securities

Hyundai Mobis: Long-term share-price performance



Source: QuantiWise, Samsung Securities

Atlas: Thermal management technology

Location	Cooling method	Operating principle	Atlas implementation
Battery	Battery thermal management system (BTMS)	Keeps cell temperature uniform via cooling plates	Removable battery pack design (marathon pit-stop style)
Inverter & driver	PCB thermal spreading + GaN low-loss	GaN reduces switching loss to 1/3-1/5 compared to Si	Driver ICs directly mounted onto joint housing
Motor windings	Thermally conductive epoxy potting	Epoxy fills gaps between windings and housing, eliminating thermal resistance	-
Motor housing	Aluminum fins with natural convection	Maximizes surface area to enhance convective heat transfer	Atlas outer profile features integrated fin structure
Reducer	Lubricant thermal conduction + housing conduction	Gear friction heat → lubricant → housing → ambient air	High-viscosity, heat-resistant grease used
System-wide	AI thermal duty cycle control	Real-time joint temperature monitoring → automatic power reduction at thermal thresholds	Software layer compensates for hardware thermal limits

Source: Boston Dynamics, Samsung Securities

Role of thermal management in robot actuator systems

Design item	Thermal management requirements	Hyundai Mobis's capabilities
Motor housing material & geometry	Use of Al-SiC composite or high-purity aluminum alloy; integrated fin design to minimize thermal resistance	Proven experience in designing and machining housings for EV drive motors
Winding potting	Epoxy with thermal conductivity ≥ 3 W/m·K to fully fill windings; application of vacuum pressure impregnation (VPI) process	Currently applying VPI process in drive motor production
Reducer lubrication & Sealing	Selection of high-temperature grease; leak-proof sealing design with compensation for thermal expansion	Experience in lubrication design for EPS and e-Axle reducers
Driver IC integration	Direct thermal path design from GaN chip to housing for efficient heat dissipation	Requires co-design with power electronics partners
Thermal simulation	Preemptive elimination of hotspots via FEM-based thermal-fluid analysis; application of DFMEA	Standardized design process aligned with automotive component development
Durability validation	High-temperature cycling tests (-40°C to 130°C); MTBF verification under continuous operation	Robust reliability testing system compliant with IATF 16949

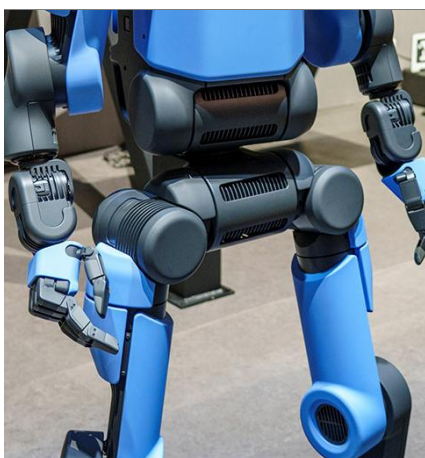
Source: Boston Dynamics, Samsung Securities

Atlas: Actuator configuration

Location	Actuator type	Core reduction mechanism	Rationale
Hips, waist, neck	Rotary	Planetary + cycloidal hybrid	Requires 360° rotation range and high torque density
Shoulders, elbows	Rotary	Custom high-torque electric actuator	Needs multi-axis rotation and flexible manipulation
Knees, ankles	Linear	Planetary roller screw (PRS)	Distributes impact loads and supports lower-body weight loads
Fingers, grippers	Micro linear	Ball screw or lead screw	Enables precise grasping in confined spaces

Source: Boston Dynamics, Samsung Securities

Atlas: Hips and waist



Source: Boston Dynamics

Atlas: Knees and ankles



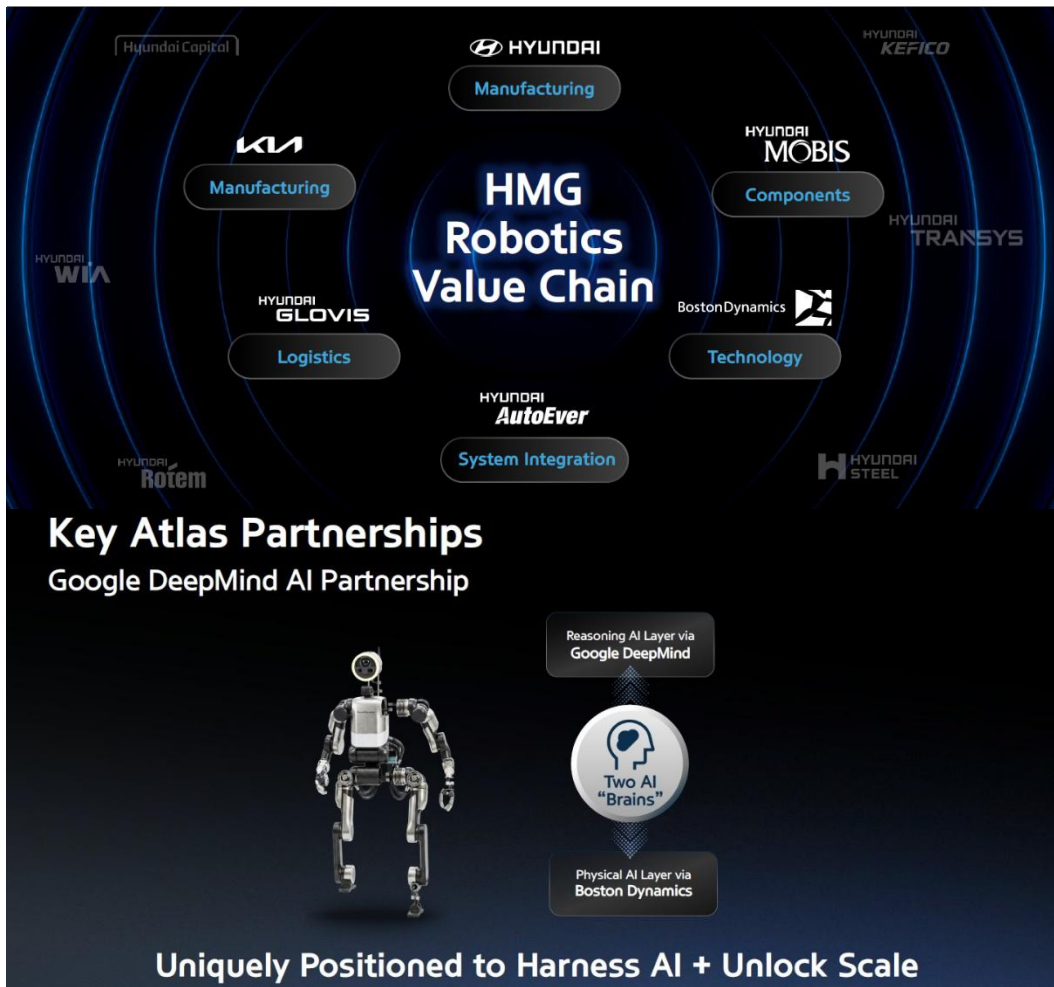
Source: Boston Dynamics

Atlas: Gripper



Source: Boston Dynamics

HMG: Robotics value chain



Source: Company data

HMC's role: Manufacturing



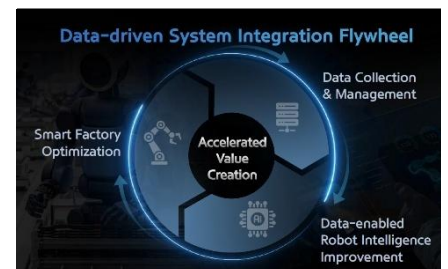
Source: Company data

Mobis's role: Core components partner



Source: Company data

AutoEver's role: System integration



Source: Company data

HMG: Global robotics ecosystem



Source: Company data

RA (Robotics America): Robot manufacturing facility 2028 targets (initial capacity of 30,000 units)

Mass Production Platform with Flexible Manufacturing

Robot Friendly Engineering

- Design for Manufacturing
- Advanced Manufacturing Partnership
- Operational Efficiency

Robot by Robot Production

Mass Production Facility for Diverse Robots
Planned Launch: 2028
Initial Capacity: 30,000 units/year

Source: Company data

RMAC (Robot Metaplant Application Center): Robot training center to be established by summer 2026

Real-World Training Hub

Continuous Workflow for Advancing Robot Physical AI

Millions of Hours of Data Accumulation

- Simulated Environment
- Physical Data Collection
- Verification of Application

Advanced Physical AI

Data collection, learning center for AI
Planned Launch: 2026 Summer
Located within HMG Metaplant America, GA

Source: Company data

Hyundai Mobis: Parts manufacturing facility 2028 targets (initial capacity of 350,000 units)

Core Component Internalization

- Lowering core component supply risk
- Cost and Quality Direct Management
- Future Component Scale-up

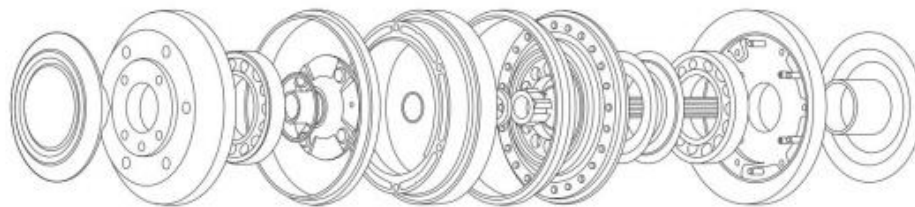
Actuator E2E Value Chain Completion
From Parts Development to Final Supply

- R&D
- Production
- Supply

Core Component Manufacturing Plant
Planned Launch: 2028
Capacity: 350,000 + units/year

Source: Company data

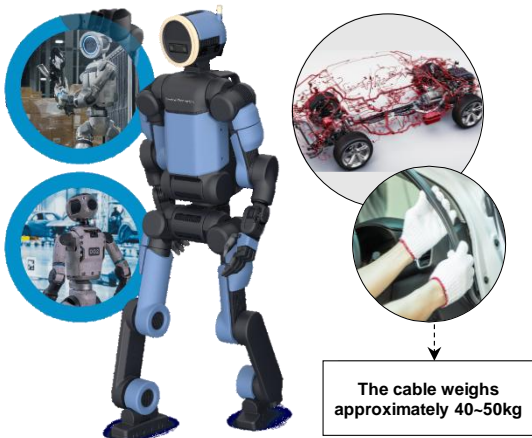
Hyundai Mobis: Cableless actuator structure



* Concept image of Mobis actuator

Source: Company data

Atlas Gen3: Employs cableless actuator structure



Source: Company data

Atlas: Cost breakdown (estimates)

Item	Unit cost (USD)	Quantity	Total cost (USD)
Rotary actuator	561	31	17,391
Vision sensor	41	3	123
Nvidia Thor chip	800	1	800
Gripper	800	2	1,600
Battery pack	200	4 kWh	200
Body			2,000
Subtotal			22,114
Data center depreciation*			26,666
Factory depreciation			442
Other operating costs			1,769
Total			50,991

Note: Assumes 10,000 units produced;

*Assumes usage of one-third of 50,000 Blackwell GPUs

Source: Samsung Securities estimates

Hyundai Mobis: Estimated revenue from Boston Dynamics Atlas

Timeline	Volume (units)	Production cost (each, USD)	Mobis manufacturing portion	Unit cost (USD)	Mobis sales* (USDm)	Mobis sales** (KRWb)
2027	5,000	130,000	60%	78,000	425	617
2028	10,000	50,992	60%	30,595	321	466
	20,000	37,659	60%	22,595	475	688
2029	30,000	33,214	60%	19,929	628	910
	40,000	30,992	60%	18,595	781	1,132
2030	50,000	29,659	60%	17,795	934	1,355

Note: *Sales figures inflated by 5% to account for aftermarket services revenue;

**Assumes exchange rate of USD/KRW1,450

Source: Samsung Securities estimates

Mobis: Results and forecasts

(KRWb)	1Q25	2Q25	3Q25	4Q25	1Q26	2Q26E	3Q26E	4Q26E	2024	2025	2026E	2027E
KRW/USD (avg)	1,453	1,401	1,387	1,452	1,467	1,450	1,430	1,420	1,365	1,423	1,442	1,390
Revenue	14,752	15,936	15,032	15,398	15,561	16,834	16,430	16,320	57,237	61,118	65,144	68,938
Chg (% y-y)	6.4	8.7	7.4	4.7	5.5	5.6	9.3	6.0	-3.4	6.8	6.6	5.8
Simple modules	6,799	7,403	6,849	7,181	7,149	7,948	7,691	7,182	25,633	28,232	29,970	31,546
Core parts & electrification	4,675	5,204	4,826	4,863	4,892	5,303	5,147	5,375	19,518	19,568	20,718	22,288
After-sales service	3,278	3,330	3,357	3,354	3,519	3,583	3,591	3,763	12,085	13,318	14,456	15,104
Gross profit	2,062	2,198	2,129	2,440	2,149	2,117	2,194	2,410	8,063	8,830	8,871	9,866
Operating profit	777	870	780	930	803	922	1,028	1,167	3,073	3,357	3,920	4,627
Chg (% y-y)	43.1	36.8	-14.1	-5.6	3.3	6.0	31.7	25.4	33.9	9.2	16.7	18.0
Modules	-100	42	-37	171	-121	-11	100	195	-42	76	164	732
After-sales service	877	828	817	760	924	933	927	972	3,116	3,282	3,756	3,895
Net profit	1,032	934	931	768	883	1,046	1,091	1,295	4,060	3,665	4,314	4,962
Controlling profit	1,031	932	929	763	882	1,044	1,089	1,292	4,056	3,656	4,307	4,954
Chg (% y-y)	19.7	-6.4	1.1	-40.3	-14.5	11.9	17.2	69.4	18.5	-9.9	17.8	15.0
Margins (%)												
Gross profit	14.0	13.8	14.2	15.8	13.8	12.6	13.4	14.8	14.1	14.4	13.6	14.3
Operating profit	5.3	5.5	5.2	6.0	5.2	5.5	6.3	7.2	5.4	5.5	6.0	6.7
Modules	-0.9	0.3	-0.3	1.4	-1.0	-0.1	0.8	1.6	-0.1	0.2	0.3	1.4
After-sales service	26.7	24.9	24.3	22.7	26.3	26.0	25.8	25.8	25.8	24.6	26.0	25.8
Net profit	7.0	5.9	6.2	5.0	5.7	6.2	6.6	7.9	7.1	6.0	6.6	7.2
Controlling net profit	7.0	5.9	6.2	5.0	5.7	6.2	6.6	7.9	7.1	6.0	6.6	7.2

Source: Company data, Samsung Securities

Income statement

Year-end Dec 31 (KRWb)	2024	2025	2026E	2027E	2028E
Sales	57,237	61,118	65,144	68,938	72,997
Cost of goods sold	49,174	52,288	56,273	59,072	62,255
Gross profit	8,063	8,830	8,871	9,866	10,742
Gross margin (%)	14.1	14.4	13.6	14.3	14.7
SG&A expenses	4,989	5,472	4,951	5,239	5,548
Operating profit	3,073	3,357	3,920	4,627	5,194
Operating margin (%)	5.4	5.5	6.0	6.7	7.1
Non-operating gains (losses)	2,191	1,758	2,138	2,265	2,398
Financial profit	812	606	456	508	595
Financial costs	486	355	167	154	154
Equity-method gains (losses)	1,788	1,400	1,750	1,870	1,965
Other	78	107	98	41	-8
Pre-tax profit	5,264	5,115	6,057	6,892	7,592
Taxes	1,204	1,450	1,743	1,930	2,126
Effective tax rate (%)	22.9	28.4	28.8	28.0	28.0
Profit from continuing operations	4,060	3,665	4,314	4,962	5,466
Profit from discontinued operations	0	0	0	0	0
Net profit	4,060	3,665	4,314	4,962	5,466
Net margin (%)	7.1	6.0	6.6	7.2	7.5
Net profit (controlling interests)	4,056	3,656	4,307	4,954	5,457
Net profit (non-controlling interests)	5	9	7	8	9
EBITDA	4,058	4,525	5,200	6,004	6,628
EBITDA margin (%)	7.1	7.4	8.0	8.7	9.1
EPS (parent-based) (KRW)	43,480	39,682	47,711	55,283	60,898
EPS (consolidated) (KRW)	43,528	39,779	47,792	55,377	61,002
Adjusted EPS (KRW)*	43,480	39,682	47,711	55,283	60,898

Cash flow statement

Year-end Dec 31 (KRWb)	2024	2025	2026E	2027E	2028E
Cash flow from operations	4,253	4,473	3,776	4,405	4,867
Net profit	4,060	3,665	4,314	4,962	5,466
Non-cash profit and expenses	625	1,841	318	417	488
Depreciation	903	1,065	1,193	1,303	1,371
Amortization	82	102	87	74	63
Other	-360	674	-962	-961	-946
Changes in A/L from operating activities	-822	-708	-68	-64	-68
Cash flow from investments	-4,589	-3,234	-2,100	-2,100	-1,900
Change in tangible assets	-2,088	-1,281	-2,100	-2,100	-1,900
Change in financial assets	65	1	-0	-0	-0
Other	-2,566	-1,953	-0	-0	-0
Cash flow from financing	-255	-1,205	-1,088	-570	-658
Change in debt	804	114	-511	0	0
Change in equity	4	10	0	0	0
Dividends	-406	-583	-577	-570	-658
Other	-657	-745	0	0	0
Change in cash	-291	134	801	2,135	2,701
Cash at beginning of year	5,079	4,788	4,922	5,724	7,859
Cash at end of year	4,788	4,922	5,724	7,859	10,560
Gross cash flow	4,685	5,506	4,632	5,379	5,955
Free cash flow	2,049	3,125	1,676	2,305	2,967

Note: *Excluding one-off items;

**Fully diluted, excluding one-off items;

***From companies subject to equity-method valuation

Source: Company data, Samsung Securities estimates

Balance sheet

Year-end Dec 31 (KRWb)	2024	2025	2026E	2027E	2028E
Current assets	28,424	30,366	32,390	35,677	39,610
Cash & equivalents	4,788	4,922	5,724	7,859	10,560
Accounts receivable	9,914	10,221	10,894	11,529	12,208
Inventories	6,763	6,862	7,314	7,740	8,196
Other current assets	6,958	8,361	8,458	8,549	8,647
Fixed assets	38,173	40,034	42,414	44,607	46,645
Investment assets	23,438	24,789	26,349	27,819	29,392
Tangible assets	12,003	12,347	13,254	14,051	14,580
Intangible assets	1,167	1,266	1,178	1,104	1,041
Other long-term assets	1,564	1,633	1,633	1,633	1,633
Total assets	66,597	70,401	74,804	80,284	86,256
Current liabilities	12,745	13,058	13,321	14,051	14,831
Accounts payable	6,748	6,691	7,132	7,548	7,992
Short-term debt	648	796	796	796	796
Other current liabilities	5,350	5,570	5,393	5,707	6,043
Long-term liabilities	7,733	8,130	8,510	8,868	9,251
Bonds & long-term debt	1,927	1,819	1,819	1,819	1,819
Other long-term liabilities	5,806	6,311	6,691	7,049	7,432
Total liabilities	20,479	21,188	21,831	22,919	24,082
Owners of parent equity	46,081	49,168	52,920	57,304	62,103
Capital stock	491	491	491	491	491
Capital surplus	1,367	1,377	1,377	1,377	1,377
Retained earnings	42,911	45,225	48,954	53,338	58,137
Other	1,311	2,075	2,098	2,098	2,098
Non-controlling interests' equity	37	45	53	61	70
Total equity	46,118	49,213	52,973	57,365	62,173
Net debt	-1,236	-1,256	-2,568	-4,704	-7,405

Financial ratios

Year-end Dec 31	2024	2025	2026E	2027E	2028E
Growth (%)					
Sales	-3.4	6.8	6.6	5.8	5.9
Operating profit	33.9	9.2	16.7	18.0	12.3
Net profit	18.6	-9.7	17.7	15.0	10.2
Adjusted EPS**	19.6	-8.7	20.2	15.9	10.2
Per-share data (KRW)					
EPS (parent-based)	43,480	39,682	47,711	55,283	60,898
EPS (consolidated)	43,528	39,779	47,792	55,377	61,002
Adjusted EPS**	43,480	39,682	47,711	55,283	60,898
BVPS	509,212	551,325	603,473	653,462	708,189
DPS (common)	6,000	6,500	6,500	7,500	8,000
Valuations (x)					
P/E***	5.4	9.4	14.4	12.4	11.3
P/B***	0.5	0.7	1.1	1.0	1.0
EV/EBITDA	5.1	7.2	11.5	9.6	8.3
Ratios (%)					
ROE	9.4	7.7	8.4	9.0	9.1
ROA	6.5	5.4	5.9	6.4	6.6
ROIC	11.3	10.7	11.8	13.3	14.3
Payout ratio	13.3	15.9	13.2	13.3	12.9
Dividend yield (common)	2.5	1.7	0.9	1.1	1.2
Net debt to equity	-2.7	-2.6	-4.8	-8.2	-11.9
Interest coverage (x)	23.8	19.0	23.5	30.0	33.7

COMPANY UPDATE

2026. 5. 29

EV/Mobility Team

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▶ AT A GLANCE

Not rated

Target price n/a

Current price **KRW156,200**

Market cap KRW1.6t / USD1.1b

Shares (float) 10,395,000 (71.8%)

52-week high/low KRW156,200/KRW24,300

Avg daily trading value (60-day) "KRW50.8b/USD33.9m"

▶ ONE-YEAR PERFORMANCE

	1M	6M	12M
Samwha Capacitor (%)	141.0	400.6	540.2
Vs Kospi (%pts)	95.6	140.2	108.8

▶ SAMSUNG vs THE STREET

No of estimates	1
Average target price (KRW)	51,000
Average rating	4.0

※ Rating: 4 < → BUY, 3 = HOLD, 2 > → SELL



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Samwha Capacitor (001820)

Why capacitors matter in robot cooling

- Samwha Capacitor derives over 50% of its sales from MLCC and 20% from DC-link products, both of which are essential components for robot thermal management.
- When actuators require instantaneous torque, capacitors deliver transient power, suppressing overall system electrical heat generation.
- With the role of capacitors continuing to expand in the AI era, Samwha Capacitor is entering a long-term growth cycle.

WHAT'S THE STORY?

Growth sustainable into physical-AI era: Beyond data-center power infrastructure and EVs, capacitors are now indispensable in robotics.

- **Key functions:** Capacitors serve three key functions: 1) power stabilization—they stabilize power by delivering quick bursts of current when components like CPUs, GPUs, inverters, or industrial machines need sudden energy spikes; 2) noise filtering—they filter out electrical noise by diverting high-frequency interference to ground, leaving only clean, reliable signals; and 3) AC/DC separation—they block direct current (DC) while allowing alternating current (AC) to pass through, making them vital as filters in signal-processing circuits.
- **Expanding role of capacitors in the AI era:** Samwha Capacitor began as a manufacturer of disc ceramic capacitors (DCCs) for home appliances and has since expanded production to include multi-layer ceramic capacitors (MLCCs), automotive DC-link capacitors, and film capacitors used in factories and power plants. Its growth drivers are MLCCs and DC-link capacitors, which together account for 70% of total sales.

(Continued on the next page)

SUMMARY FINANCIAL DATA

(KRWb)	2022	2023	2024	2025
Revenue	263	281	295	294
Operating profit	31	24	18	13
Net profit (adj)	29	21	22	13
EPS (adj) (KRW)	2,803	2,002	2,100	1,206
EPS (adj) growth (% y-y)	2.5	(28.6)	4.9	(42.6)
EBITDA margin (%)	18.9	16.1	12.3	10.3
ROE (%)	13.7	8.9	8.6	4.6
P/E (adj) (x)	10.7	19.0	13.1	24.3
P/B (x)	1.4	1.6	1.1	1.1
EV/EBITDA (x)	5.1	7.5	5.5	7.2
Dividend yield (%)	1.7	1.3	1.8	1.7

Source: Company data, Samsung Securities estimates

- **Capacitors help manage heat in robots:** Unlike EVs, robots rely primarily on air cooling for thermal management. Actuators and capacitors are critical components—actuators are the main source of heat, while capacitors regulate instantaneous power output to control overall system heat generation. Robots incorporate 40-50% more MLCCs than smartphones do.

In robotics, capacitors serve as power dams that prevent electrical heat generation at its source.

- **Peak current buffering:** When robots lift heavy objects, capacitors supply instantaneous power to actuators, preventing excessive power from flowing directly from the battery to the joints, thereby controlling current spikes across the entire circuit. Sudden high current draw to a motor causes exponential heat generation due to resistance in wiring and circuits, placing severe strain on cooling systems. By delivering on-demand power locally, capacitors act as a first line of thermal defense that fundamentally suppresses the system's total electrical heat generation.
- **MLCC adoption expanding amid shift in power devices:** Replacing the motor driver IC for actuators with gallium nitride (GaN) power devices creates a cascade of improvements: the inverter runs cooler, enabling smaller capacitors, which frees up space in the joint and simplifies thermal design. MLCCs benefit from this structural transition.
- **Potential in robotics sales:** Samwha Capacitor's DC-link products—which it supplies for EVs and hybrid vehicles—can be adapted for robotic battery packs, while its MLCCs are applicable to actuators. Hyundai Motor Group integrated Samwha Capacitor into its value chain in 2013 when the parts maker developed DC-link technology. Approximately 30% of its MLCC sales come from EV and automotive electric/electronic (E/E) applications.

MLCCs and DC-link capacitors to drive earnings growth from 2Q

- **MLCC sales hit KRW38.7b in 1Q, up 24.2% y-y and accounting for 52% of total sales:** Driven by an ongoing boom in data-center construction investments, Samwha Capacitor has achieved strong growth in MLCC sales. Less than 5% of Samwha Capacitor's revenue comes from supplying MLCCs to data centers. However, the company is actively supplying MLCCs to the power infrastructure and inverters supporting data center operations.

To operate reliably, AI data centers require robust power infrastructure—including high-voltage transformers, uninterruptible power supplies (UPS), power distribution units (PDU), and power supply units (PSU) for server racks. MLCCs play a vital role in these systems by stabilizing power flow and absorbing voltage spikes. Samwha Capacitor supplies MLCCs specifically for these power infrastructure components.

- **Tier-1 players to mark up prices in 2Q:** Murata and Samsung Electro-Mechanics have announced ASP hikes of 5-10% starting in 2Q26, citing supply constraints—for reference, demand currently exceeds available capacity by more than two-fold. Accordingly, Samwha Capacitor's MLCC stands to benefit from this broader pricing momentum.
- **2H capacity expansion at Yongin plant could boost output by 40-50%:** Samwha Capacitor's domestic MLCC production lines ran at 85% capacity last year and are now fully up and running. Its peak MLCC sales of KRW163b occurred in 2018, during the earlier cloud data center boom—just 15% larger than its 2025 sales. Its consolidated 2018 sales and operating profit hit KRW274b and KRW81b, respectively, for an operating margin of 29.6%. The stock price hit a record high of KRW109,500 at that time.

Today's AI-driven capex cycle is five times larger—projected at USD750b-USD1t between 2025 and 2026, compared to USD130b-USD1500b in 2015-2018. To meet demand, Samwha Capacitor invested KRW14.5b in 2025 to expand and modernize its Yongin plant. The ramp-up construction is nearing completion and the newly-added production capacity should begin to generate sales from 2H26.

- **Second wave of EV adoption drives growth in DC-link and MLCC sales:** DC-link capacitors stabilize voltage fluctuations during the inverter's DC-to-AC conversion process, absorbing current ripple and buffering sudden voltage spikes that could damage semiconductor components in the inverter. Hybrids require one DC-link unit per vehicle; EVs require two. Samwha Capacitor developed DC-link technology in 2013 and supplies DC-link capacitors to HMG and European automakers (the latter via global parts makers).
- HMC and Kia are expanding their hybrid lineups and building full EV lineups in response to growing demand for EVs in Korea and Europe. In Europe, supported by the reinstatement of EV subsidies, EV sales are growing by over 30% y-y.

2026 guidance: The company targets 2026 sales growth of 5-10% y-y and operating profit growth of 40% y-y, led by higher MLCC utilization rates and ASP hikes.

- **Sales can exceed KRW300b:** FnGuide consensus has revenue of KRW331.5b (up 2.6% y-y), operating profit of KRW21b (up 62.7% y-y), and an operating margin of 6.33%. The stock is trading at 65x consensus P/E.
- **Valuation context:** During the 2015-2018 cloud/data center boom, MLCC peers traded at P/E of 20x-45x.
- **Corporate governance & financial structure:** Shareholder ownership consists of major shareholder (Chairman Oh, Young-ju and affiliates) 19.54%, Korea JCC 6.37%, and Samhwa Electric 2.24%. Circular ownership structure exists within the Samhwa Capacitor Group (capacitor, electric, electronics subsidiaries). Debt-to-equity ratio stood at 21.7% as of end-2025, and the company has transitioned to net cash position since 2018. In 2025, operating cash flow hit KRW26b, with capex of KRW17b (pointing to sustainable, self-funded investment model). R&D took up 1.19% of sales (according to annual report).
- **Dividend policy:** The company set its 2025 DPS at KRW500, for a dividend payout ratio of 41.5%. As it meets criteria for high-dividend stock status, its shareholders are eligible for separate taxation of dividend income under Korean tax law.

Role of capacitors in robotics thermal management

Component	Type	Thermal management role	Supply chain relevance
Main DC bus	Film or high-capacity electrolytic	Absorbs regenerative energy surges to prevent battery overcharge/overheating; reduces inverter heat by suppressing voltage spikes	Samsung Condenser DC-link; high voltage/temperature tolerance is critical
Joint driver DC link	MLCC (ceramic)	Filters high-frequency ripple current from GaN switching; improves inverter efficiency and lowers system heat	Samsung Electro-Mechanics, TDK, Murata, Samsung Condenser; trend shifting from electrolytic to ceramic for GaN systems
AI computing board	Polymer tantalum + MLCC	Delivers instant current to CPU/GPU; suppresses power noise to prevent thermal miscalculation	Low-ESL, low-ESR high-capacity MLCCs

Source: Media, Samsung Securities

Humanoid robot: capacitor count by location

Location	Number of capacitors	Product type
Joint actuators (20-30 units)	Several hundred to over a thousand	MLCC
AI inference chips	Tens	MLCC
Sensors & communication modules	Tens	MLCC
Batteries	1-2	DC-link
Total	Several hundred to around 1,500	

Source: Media, Samsung Securities

Samwha Capacitor: Product lineup



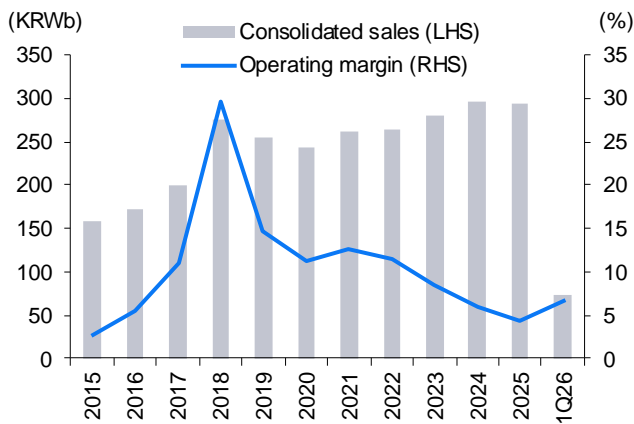
Source: Company data, Samsung Securities

Samwha Capacitor: 1Q review

(KRWm)	1Q25	Portion (%)	1Q26	Portion (%)	Chg (% y-y)
MLCC	31,221	43	38,771	53	24.2
FC	9,310	13	7,851	11	-15.7
DC-link	14,446	20	14,335	20	-0.8
DCC	7,179	10	5,705	8	-20.5
Other	10,270	14	6,191	8	-39.7
Revenue	72,426	100	72,853	100	0.6
Operating profit	4,814		4,696		-2.5
Operating margin (%)	6.6		6.4		-0.2%pts y-y

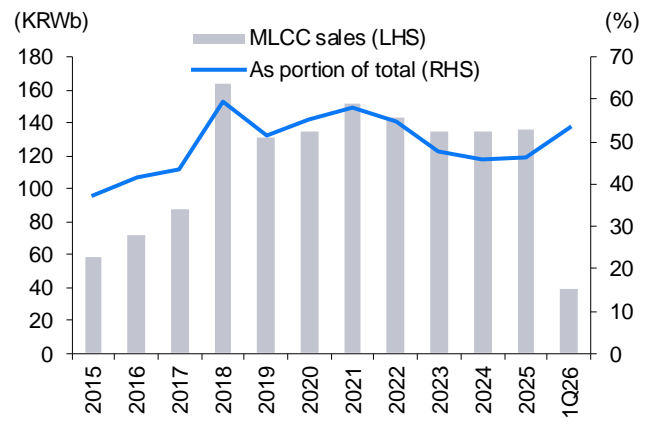
Source: Company data, Samsung Securities

Samwha Capacitor: Revenue and operating margin



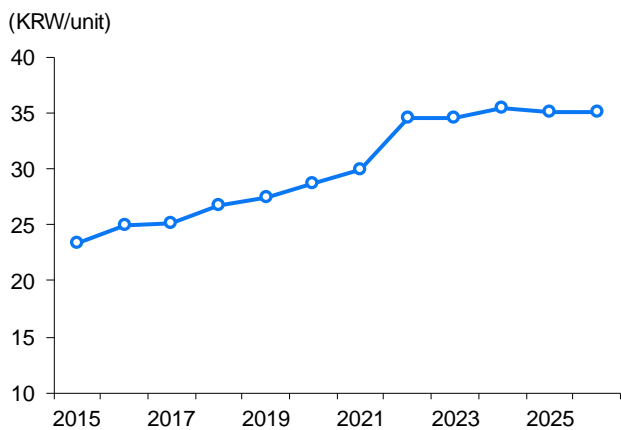
Source: Company data, Samsung Securities

Samwha Capacitor: MLCC sales



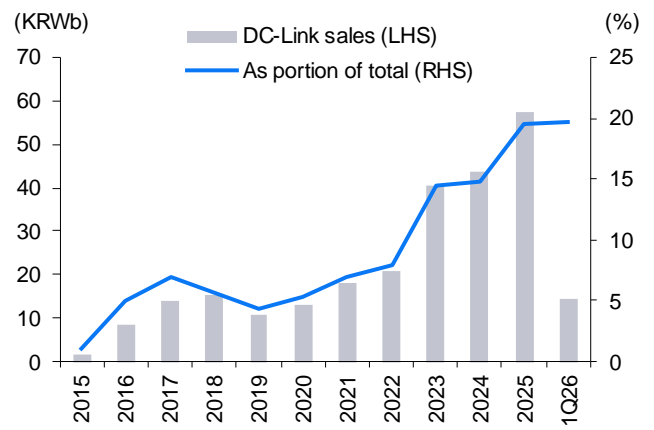
Source: Company data, Samsung Securities

Samwha Capacitor: Ceramic products' ASP



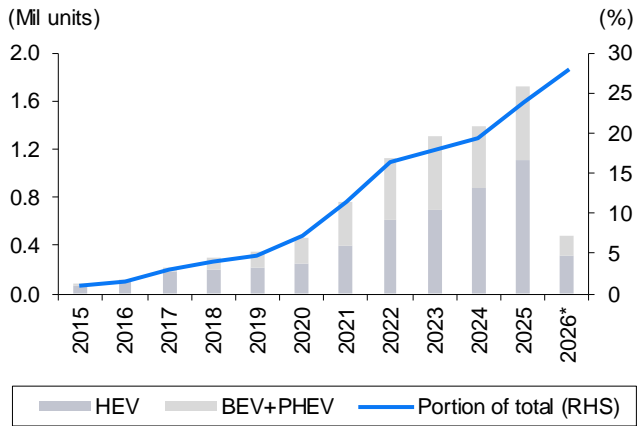
Source: Company data, Samsung Securities

Samwha Capacitor: DC-link sales



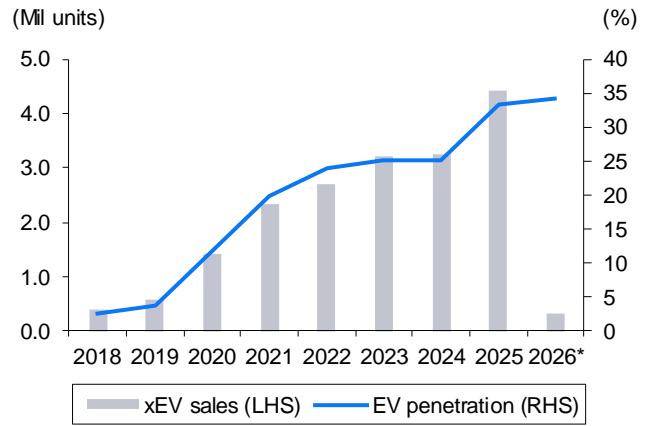
Source: Company data, Samsung Securities

HMC/Kia: HEV and EV (BEV+PHEV) sales volumes



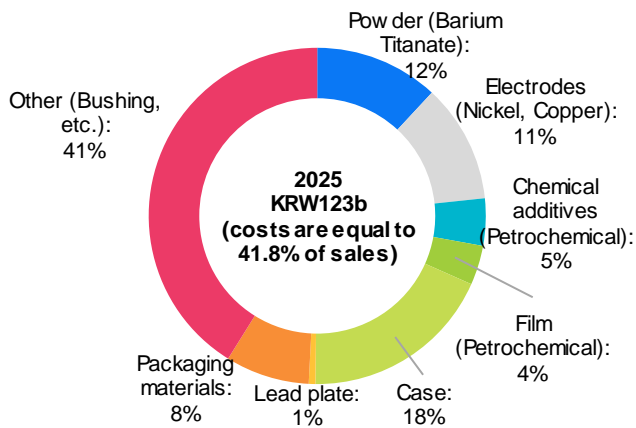
Note: *As of 1Q26
Source: Company data, Samsung Securities

Europe: EV sales volume



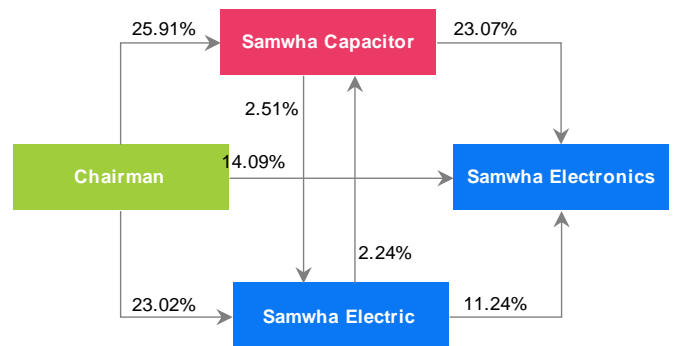
Note: *As of 1Q26
Source: ACEA, Samsung Securities

HMC/Kia: Breakdown of material costs



Source: Company data, Samsung Securities

Samwha Capacitor: Governance structure



Source: Company data, Samsung Securities

Income statement

Year-end Dec 31 (KRWb)	2021	2022	2023	2024	2025
Sales	262	263	281	295	294
Cost of goods sold	203	206	229	248	250
Gross profit	59	58	52	47	44
Gross margin (%)	22.4	21.9	18.6	16.0	15.0
SG&A expenses	26	27	28	29	31
Operating profit	33	31	24	18	13
Operating margin (%)	12.7	11.6	8.4	6.0	4.4
Non-operating gains (losses)	3	3	2	9	2
Financial profit	4	9	7	12	8
Financial costs	3	7	6	4	7
Equity-method gains (losses)	0	0	0	0	(0)
Other	2	0	1	1	1
Pre-tax profit	36	33	26	27	15
Taxes	8	4	5	5	2
Effective tax rate (%)	21.5	11.9	19.1	18.2	13.4
Profit from continuing operations	29	29	21	22	13
Profit from discontinued operations	0	0	0	0	0
Net profit	29	29	21	22	13
Net margin (%)	10.9	11.1	7.5	7.5	4.3
Net profit (controlling interests)	28	29	21	22	13
Net profit (non-controlling interests)	0	0	0	0	0
EBITDA	50	50	45	36	30
EBITDA margin (%)	19.2	18.9	16.1	12.3	10.3
EPS (parent-based) (KRW)	2,753	2,822	2,013	2,120	1,213
EPS (consolidated) (KRW)	2,753	2,822	2,013	2,120	1,213
Adjusted EPS (KRW)*	2,753	2,822	2,013	2,120	1,213

Cash flow statement

Year-end Dec 31 (KRWb)	2021	2022	2023	2024	2025
Cash flow from operations	36	53	34	39	26
Net profit	29	29	21	22	13
Non-cash profit and expenses	29	32	28	21	20
Depreciation	17	19	21	18	17
Amortization	0	0	0	0	0
Other	11	13	7	3	3
Changes in A/L from operating activities	(18)	(2)	(8)	(3)	(4)
Cash flow from investments	(23)	(29)	(48)	(36)	(13)
Change in tangible assets	(19)	(24)	(25)	(11)	(17)
Change in financial assets	(4)	(3)	(23)	(25)	9
Other	(0)	(2)	(0)	0	(5)
Cash flow from financing	(4)	(11)	(8)	(10)	(3)
Change in debt	(2)	(5)	(2)	(5)	(1)
Change in equity	0	0	0	0	3
Dividends	(3)	(5)	(5)	(5)	(5)
Other	1	(1)	0	0	1
Change in cash	8	13	(20)	(5)	11
Cash at beginning of year	36	44	57	37	32
Cash at end of year	44	57	37	32	42
Gross cash flow	57	61	49	43	33
Free cash flow	16	29	9	28	9

Note: *Excluding one-off items;

**Fully diluted, excluding one-off items;

***From companies subject to equity-method valuation

Source: Company data, Samsung Securities estimates

Balance sheet

Year-end Dec 31 (KRWb)	2021	2022	2023	2024	2025
Current assets	148	162	177	206	214
Cash & equivalents	44	57	37	32	42
Accounts receivable	51	54	61	70	67
Inventories	40	34	37	36	43
Other current assets	12	17	42	69	62
Fixed assets	121	125	131	122	126
Investment assets	19	15	22	21	25
Tangible assets	94	98	100	94	96
Intangible assets	1	1	1	1	1
Other long-term assets	8	12	8	7	4
Total assets	269	287	308	328	340
Current liabilities	53	54	55	54	53
Accounts payable	24	26	32	34	34
Short-term debt	11	6	4	0	0
Other current liabilities	17	21	19	20	19
Long-term liabilities	14	8	8	7	7
Bonds & long-term debt	0	0	0	0	0
Other long-term liabilities	14	8	8	7	7
Total liabilities	66	62	63	61	61
Owners of parent equity	202	224	244	265	278
Capital stock	10	10	10	10	10
Capital surplus	5	5	5	5	7
Retained earnings	177	205	219	236	243
Other	10	4	10	14	17
Non-controlling interests' equity	1	1	2	2	2
Total equity	203	225	245	267	280
Net debt	(37)	(58)	(62)	(87)	(90)

Financial ratios

Year-end Dec 31	2021	2022	2023	2024	2025
Growth (%)					
Sales	8.1	0.5	6.6	5.2	(0.3)
Operating profit	22.4	(8.0)	(22.4)	(24.7)	(27.9)
Net profit	22.0	2.5	(28.7)	5.3	(42.8)
Adjusted EPS**	22.0	2.5	(28.7)	5.3	(42.8)
Per-share data (KRW)					
EPS (parent-based)	2,753	2,822	2,013	2,120	1,213
EPS (consolidated)	2,753	2,822	2,013	2,120	1,213
Adjusted EPS**	2,753	2,822	2,013	2,120	1,213
BVPS	19,654	21,828	23,733	25,847	26,701
DPS (common)	500	500	500	500	500
Valuations (x)					
P/E***	21.9	10.6	18.9	13.0	24.1
P/B***	3.1	1.4	1.6	1.1	1.1
EV/EBITDA	11.7	5.1	7.5	5.5	7.2
Ratios (%)					
ROE	15.2	13.8	9.0	8.7	4.6
ROA	11.4	10.5	7.0	6.9	3.8
ROIC	17.4	17.2	11.9	8.9	6.7
Payout ratio	18.0	17.6	24.7	23.5	41.5
Dividend yield (common)	0.8	1.7	1.3	1.8	1.7
Net debt to equity	(18.1)	(25.9)	(25.3)	(32.6)	(32.1)
Interest coverage (x)	69.1	66.2	45.1	67.5	63.0

COMPANY UPDATE

2026. 5. 19

EV/Mobility Team

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Team Leader

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Hyunji Kim

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▶ AT A GLANCE

BUY

Target price **KRW85,000** 37.5%

Current price **KRW61,800**

Market cap KRW7.7t/USD5.1b

Shares (float) 123,875,069 (55.3%)

52-week high/low KRW75,900/KRW37,550

Avg daily trading value (60-day) KRW27.5b/
USD18.4m

▶ ONE-YEAR PERFORMANCE

	1M	6M	12M
Hankook T&T (%)	3.9	7.9	53.9
Vs Kospi (%pts)	-14.4	-43.3	-46.2

▶ KEY CHANGES

(KRW)	New	Old	Diff
Recommend.	BUY	BUY	
Target price	85,000	85,000	0.0%
2026E EPS	9,175	9,175	0.0%
2027E EPS	10,984	10,984	0.0%

▶ SAMSUNG vs THE STREET

No of estimates	13
Target price	84,923
Recommendation	4.0

※ Rating: 4 <→ BUY, 3 = HOLD, 2 > → SELL



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Hankook T&T (161390)

1Q review; Competitiveness shines despite Iran conflict

- Hankook T&T's 1Q operating profit met market consensus but came in 8% below our forecast due to the deferral of about KRW40b in anti-dumping duty refunds.
- Raw material cost pressure, driven by the Middle East conflict, should begin impacting margins starting in 3Q. However, these headwinds are expected to be partially offset by 50–60% through product price increases, higher mix contribution from EV tires, and expanding market share in Europe.
- Despite strong momentum from growing EV tire demand and market share gains in Europe, the company trades at a 50% discount to its peers on a P/E basis. It should offer a dividend yield of 5.3% for the year.

WHAT'S THE STORY?

Solid 1Q26 results: Hankook T&T's tire sales grew 9.3% y-y in 1Q, despite flat RE and OE tire sales volumes, driven by a weaker won against the US dollar and a favorable product mix. Logistics costs (accounting for 4-5% of total sales) and raw material costs trended lower. Anti-dumping duty refunds (estimated at KRW40b pa; typically recognized in 4Q; due to a fall in anti-dumping duty rate) was deferred to 2Q-3Q26.

- **High profitability seen in 2023-2024 in replay:** The tire business posted sales of KRW2.5t (up 9.3% y-y), operating profit of KRW437.5b (up 31.2% y-y), and an operating margin of 17.1% (down 2.9%pts y-y). The performance was fueled by: 1) ASP hike; and 2) a favorable product mix with increased sales of EV tires (typically 19 inches or larger; priced 5-10% higher than 17-18-inch tires)—vs cost decline two years ago. Tires of 18-inches and above accounted for 49.1% of total sales, up 2%pts y-y.

(Continued on the next page)

SUMMARY 1Q RESULTS

(KRWb)	1Q26	Chg		Diff (%)	
		(% y-y)	(% q-q)	Samsung	Consensus
Sales	5,313.9	7.1	-2.6	4.0	1.7
Operating profit	507.0	43.0	-7.3	-8.3	1.8
Pre-tax profit	528.8	34.4	105.3	17.3	22.3
Controlling profit	346.2	8.3	75.3	-7.5	4.1
Margins (%)					
Operating profit	9.5				
Pre-tax profit	10.0				
Controlling profit	6.5				

Source: Company data, Fnguide, Samsung Securities estimates

VALUATION SUMMARY

	2025	2026E	2027E
Valuation (x)			
P/E	6.6	6.7	5.6
P/B	0.6	0.6	0.5
EV/EBITDA	4.1	3.8	3.3
Div yield (%)	3.9	5.3	6.5
EPS growth (% y-y)	-2.3	4.3	19.7
ROE (%)	9.4	9.1	10.1
Per-share data (KRW)			
EPS	8,795	9,175	10,984
BVPS	99,234	106,421	114,275
DPS	2,300	3,300	4,000

The 9.3% y-y hike in sales was driven by: 1) volume increase (1.8%); 2) price hikes (2.3%); and 3) a weaker won (6.5%). On the cost side, raw materials (at Korean plant levels: USD1,632 per tonne, down 8.6% y-y) and logistics expenses remained stable at about 5% of sales.

- **Regional performance—Sales growth balanced except Korea:** Hankook T&T's sales in: 1) Korea came in at KRW235b (down 2.9% y-y), reflecting contraction in the RE market due to inflationary pressures, despite a hike in OE tire sales thanks to higher demand for EV tires; 2) China reached KRW230b (up 18.5% y-y), driven by a rebound in RE tire demand from a low base, despite a fall in EV tire sales due to reduced government subsidies for electric vehicles; 3) Europe hit KRW1.2t (up 18.5% y-y), resulting in a hike in market share; and 4) North America reached KRW567b (up 5.1% y-y), fueled by an improved RE tire mix and increased OE tire supply.
- **Share of EV tires:** At Hankook T&T, the EV tire portion of its total OE tire sales reached 29.6% (up 6.6%pts y-y). The figure is, however, lower than the 4Q25 level of 32%, attributable to a fall in EV demand in China—EV demand in China fell 20% y-y, due to reduced purchase subsidies (from CNY20,000 to CNY15,000) and the reintroduction of a 5% purchase tax (from 0%). Hankook T&T, which supplies tires to pure EV manufacturers such as Tesla and BYD, took a hit during 1Q. EV demand in China should recover starting in April.
- **Raw material cost headwinds:** In 2025, raw material costs equated to 30% of Hankook T&T's sales, with the largest components being natural rubber (8.2% of sales), synthetic rubber (6.7%), tire cord (4.69%), and carbon black (4.27%). Butadiene, a feedstock for synthetic rubber, is produced through naphtha cracking, while carbon black is made by thermal decomposition of heavy fuel oil.

Raw material input prices (based on the Korean plant) should fall 4.8% y-y to USD1,769 per tonne in 2Q, but they have begun rising q-q after hitting a bottom in 4Q25.

Since the start of the year, synthetic rubber and carbon black prices have increased 12% and 20%, respectively, due to the Middle East conflict. Tire inventory levels remain at a three-month supply, meaning cost impacts will be reflected starting in 3Q. Without mitigation efforts, this could pressure operating margin by 1.6–2%pts.
- **Raw material cost mitigation strategies:** For natural rubber, the company seeks diversification of procurement sources to Africa and Laos. For synthetic rubber and carbon black, the company plans price increases. In early 2026, the company implemented 2% price hikes in Europe and Korea, with further adjustments under review for 2H.
- **Logistics costs to remain stable:** Logistics expenses are expected to stay at 4–5% of sales. While the Shanghai Containerized Freight Index rose due to the Middle East conflict, the company does not transit through the Strait of Hormuz. Negotiations for 2H freight rates are ongoing, and due to distinct shipping routes, material impact on costs is not anticipated.

European market—Opportunity from EU anti-dumping duties on Chinese tires

- **Investigation timeline:** The EU launched its investigation in May 2025 for a 12-month period. Final duty rates will be determined by May 7, 2026, following submissions from affected companies. Anti-dumping duties are scheduled to take effect on Jun 18, 2026.
- **Duty rates:** 30% for companies that fully cooperate with the investigation and 52% for non-cooperating ones.

- **Hankook T&T's duty rate–3.4%:** Hankook T&T received a significantly lower rate due to consistent pricing adjustments and transparent cost structures that demonstrate its pricing is not aligned with the dumped Chinese products under review. With a significantly lower duty rate than competitors and leveraging its Hungarian plant, Hankook T&T aims to expand its market share in Europe. As of 1Q, Europe accounted for 46.8% of total sales — the most critical market for the company. Now, its market share in Europe stands at 13%, up 5%pts over the past decade.

2Q earnings outlook

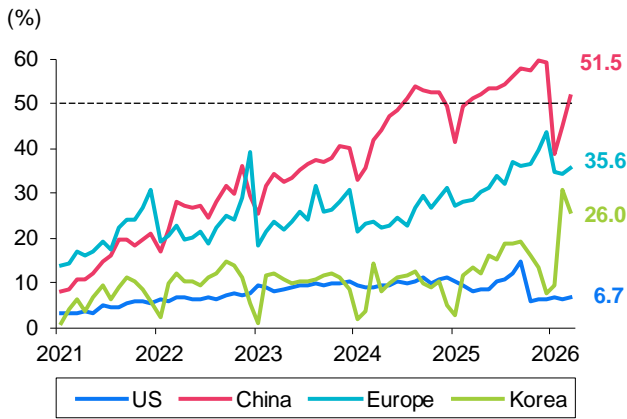
- **Margin to fall q-q due to rising raw material costs:** We forecast Hankook T&T to post 2Q sales of KRW5.6t (up 6% q-q and 5.0% y-y), operating profit of KRW518.3b (up 2.2% q-q and 46.6% y-y), and an operating margin of 9.2%. If anti-dumping duty refunds are recognized, operating profit could rise to KRW560b. FnGuide consensus estimates sales at KRW5.6t, operating profit at KRW541.5 billion, and an operating margin at 9.5%.
- **Anti-dumping duty refunds to be recognized in 2Q–3Q:** Refunds previously received annually in 4Q (due to lower US anti-dumping duties) were initially deferred to 1Q26 due to a US government shutdown and are now expected to be further delayed until 2Q-3Q26. The US anti-dumping duty on Korean tires was originally set on May 24, 2021. Hankook T&T and two other domestic tire manufacturers submitted data and pursued legal appeals, resulting in a downward revision in early Feb 2024. Hankook T&T's duty rate was reduced from 27.05% to 6.3% (by 20.75%pts). Refunds for the duty differential—to be recognized for a three-year period—were received in 4Q23 (KRW100 billion) and 4Q24 (KRW70b). A KRW40b refund, originally expected in 4Q25, has now been deferred to 2Q–3Q26.
- **Tennessee # 2 plant (US) to reach more than 90% utilization in 2H26:** An additional 6m units of capacity came online in 4Q25.

Hankook T&T: Results and forecasts

(KRWb)	1Q25	2Q25	3Q25	4Q25	1Q26	2Q26E	3Q26E	4Q26E	2024	2025	2026E	2027E
KRW/USD (average)	1,453	1,401	1,387	1,452	1,467	1,450	1,430	1,420	1,365	1,423	1,442	1,390
Revenue	4,964	5,370	5,413	5,456	5,314	5,639	5,515	5,564	9,412	21,202	22,031	22,948
Chg (% y-y)	133.3	131.7	122.3	115.5	7.1	5.0	1.9	2.0	5.3	125.3	3.9	4.2
Tire	2,346	2,511	2,707	2,754	2,566	2,722	2,774	2,729	9,412	10,319	10,790	11,424
Chg (% y-y)	10.3	8.3	11.2	8.8	9.3	8.4	2.5	-0.9	5.3	9.6	4.6	5.9
Thermal management	2,617	2,858	2,706	2,703	2,748	2,917	2,741	2,835	n/a	10,884	11,241	11,523
Chg (% y-y)	n/a	n/a	n/a	n/a	5.0	2.0	1.3	4.9	n/a	n/a	3.3	2.5
Gross profit	964	1,098	1,297	1,306	1,202	1,267	1,346	1,259	3,468	4,665	5,074	5,528
Operating profit	355	354	586	547	507	518	479	454	1,762	1,841	1,958	2,258
Chg (% y-y)	-11.1	-15.8	24.6	15.5	43.0	46.6	-18.3	-17.0	32.7	4.5	6.4	15.3
Tire	334	289	491	457	438	410	375	304	1,762	1,571	1,498	1,768
Chg (% y-y)	-16.3	-31.1	4.3	-3.4	28.4	41.7	-23.6	-33.5	32.7	-10.9	-4.6	18.0
Thermal management	21	64	95	90	97	108	104	150	n/a	270	460	490
Chg (% y-y)	-67.7	-10.2	-1.0	nm	361.1	68.6	9.0	67.5	n/a	n/a	70.0	6.7
Net profit	312	179	390	91	372	293	276	282	1,131	972	1,223	1,462
Controlling profit	320	182	390	197	346	272	257	262	1,115	1,089	1,137	1,359
Margins (%)												
Gross profit	19.4	20.4	24.0	23.9	22.6	22.5	24.4	22.6	36.8	22.0	23.0	24.1
Operating profit	7.1	6.6	10.8	10.0	9.5	9.2	8.7	8.2	18.7	8.7	8.9	9.8
Tire	14.2	11.5	18.1	16.6	17.1	15.1	13.5	11.1	18.7	15.2	13.9	15.5
Thermal management	0.8	2.2	3.5	3.3	3.5	3.7	3.8	5.3	n/a	2.5	4.1	4.3
Net profit	6.3	3.3	7.2	1.7	7.0	5.2	5.0	5.1	12.0	4.6	5.5	6.4
Controlling profit	6.4	3.4	7.2	3.6	6.5	4.8	4.7	4.7	11.8	5.1	5.2	5.9

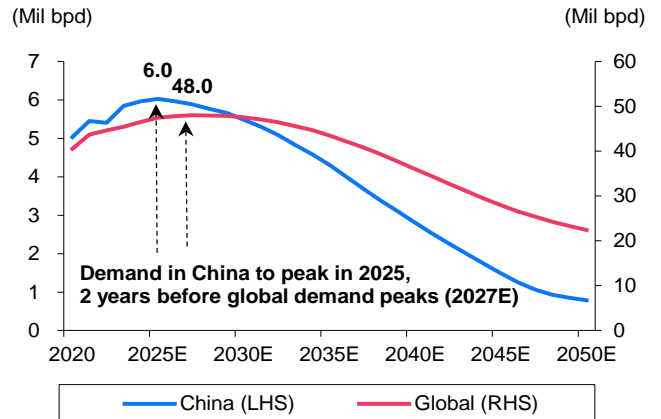
Source: Company data, Samsung Securities estimates

Global xEV penetration, by region



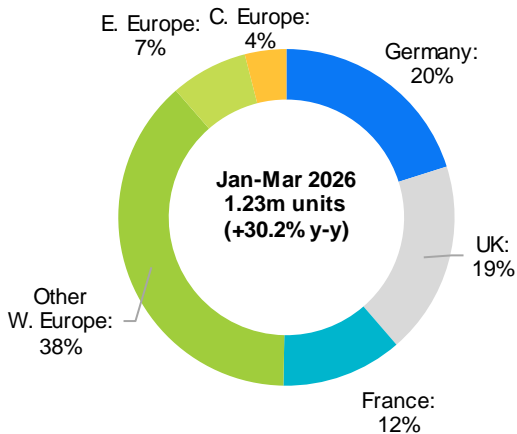
Source: EV-Volumes, Samsung Securities

Global transportation fuel: Peak demand—China vs the world



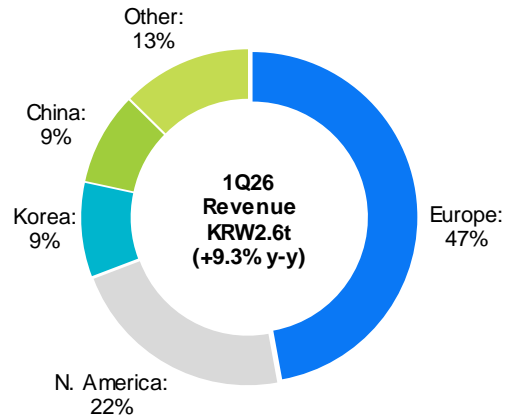
Source: Bloomberg NEF, Samsung Securities

Europe: EV demand, by country



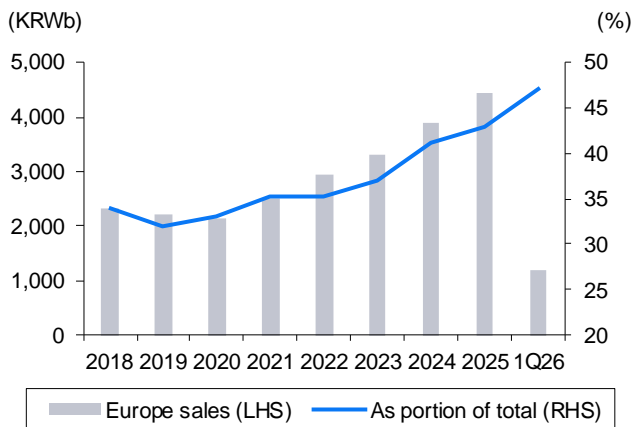
Source: EV-Volumes, Samsung Securities

Hankook T&T: Sales, by country



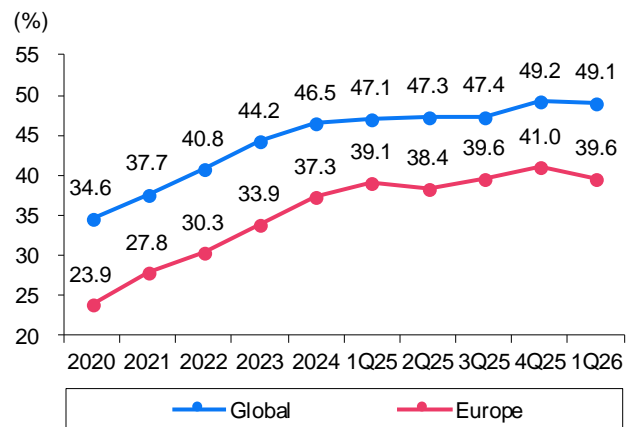
Source: Company data, Samsung Securities

Hankook T&T's revenue from Europe: Absolute and as portion of total



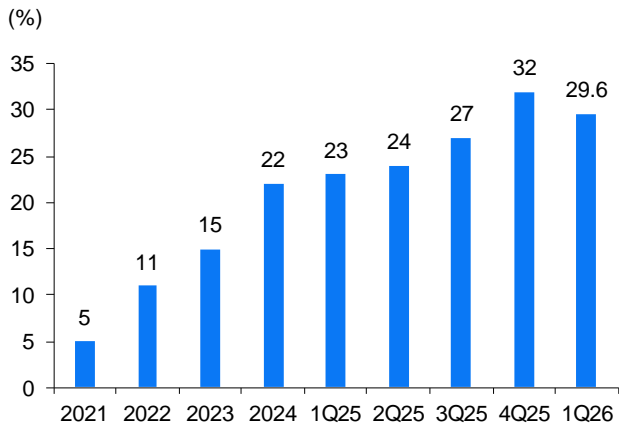
Source: Company data, Samsung Securities

Hankook T&T: 18-inch-or-larger portion of tires



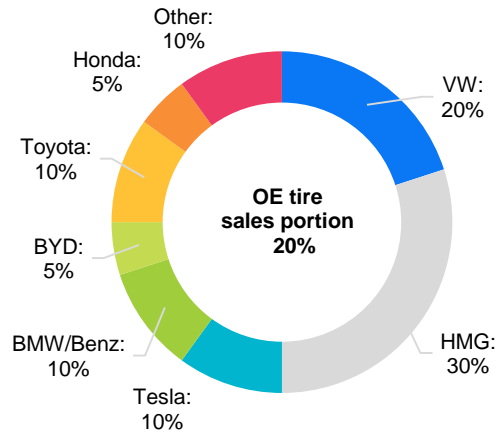
Source: Company data, Samsung Securities

Hankook T&T: EV tire portion of total OE tire sales volume



Source: Company data, Samsung Securities

Hankook T&T: OE tire sales, by customer



Source: Company data, Samsung Securities

Tesla: Model Y (comes with 19- or 20-inch tires)



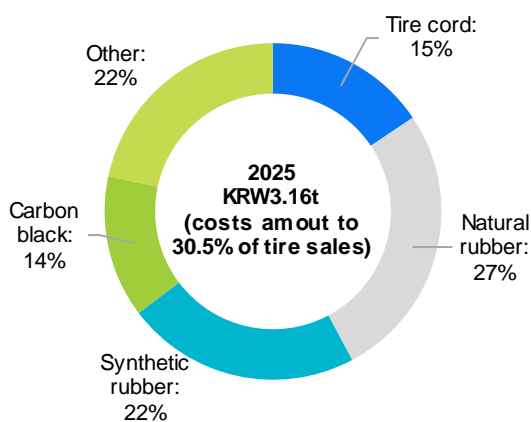
Source: Company data

Ford: F-150 Lightning (18- 20- or 22-inch tires)



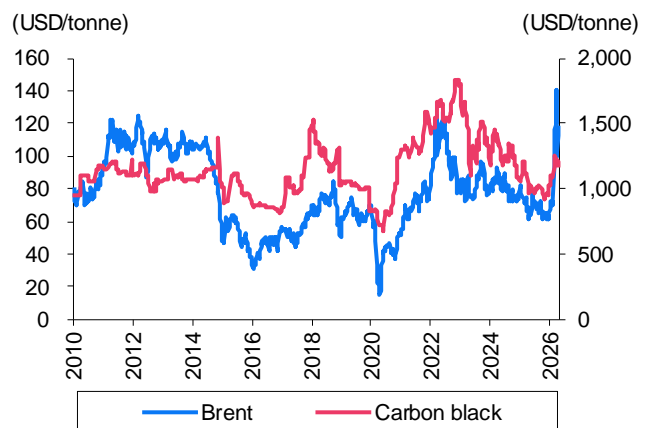
Source: Company data

Hankook T&T: Material cost breakdown



Source: Company data, Samsung Securities

Oil prices vs carbon black prices



Note: Based on Brent crude

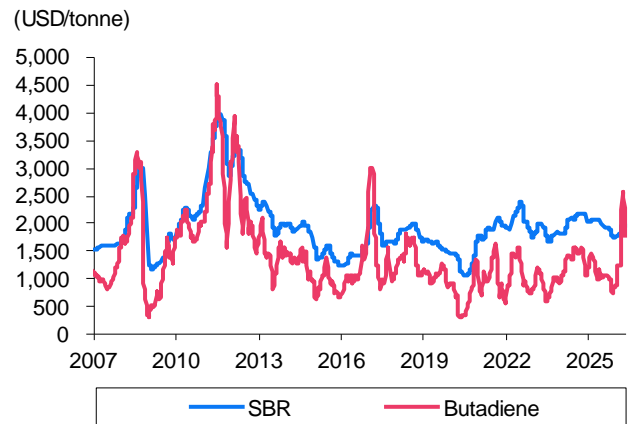
Source: Bloomberg, Samsung Securities

Natural rubber price



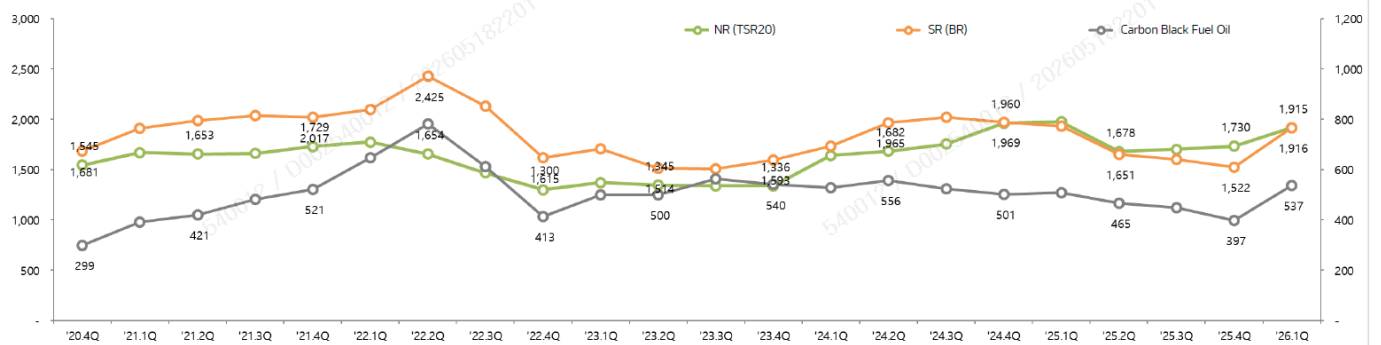
Source: Bloomberg, Samsung Securities

Synthetic rubber and butadiene prices



Source: Bloomberg, Samsung Securities

Hankook T&T: Raw material input costs



Note 1) TSR20 : SICOM Price (Natural Rubber)

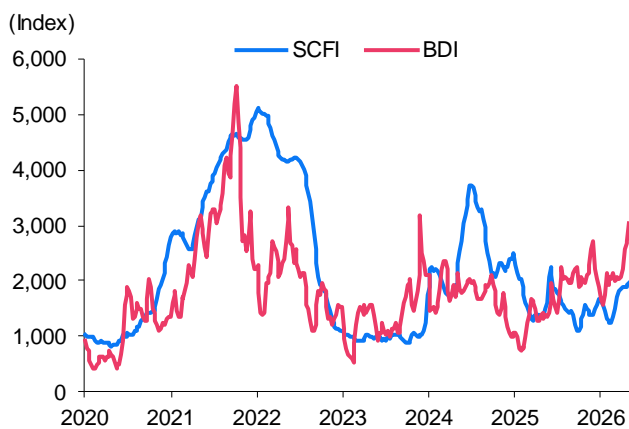
Note 2) BR(Butadiene Rubber) : ICIS CFR NE/SE Asia Average Price

Note 3) Carbon Black Fuel Oil: Index Price of refined Oil

Note: Unit = USD/tonne

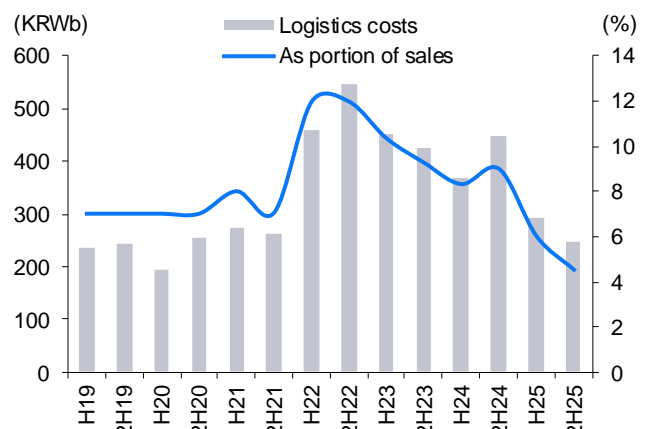
Source: Company data

Shipping indices: SCFI and BDI



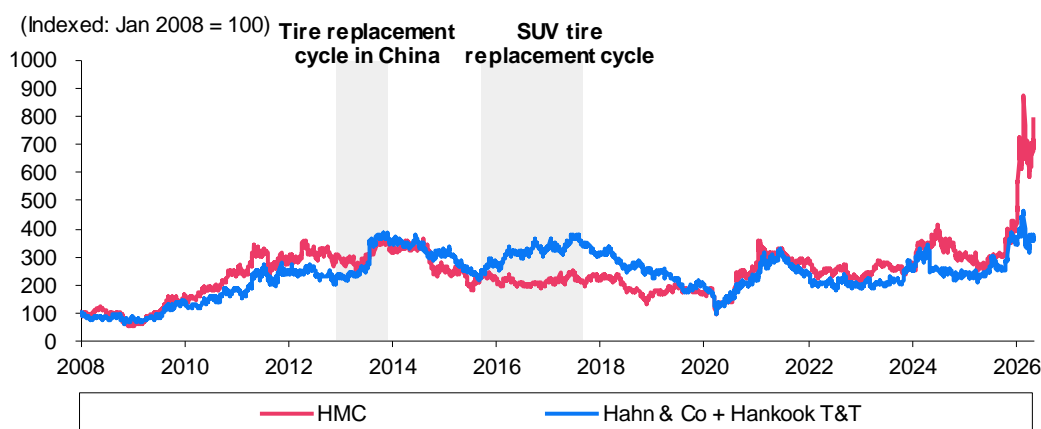
Source: Bloomberg, Samsung Securities

Hankook T&T: Logistics costs



Source: Company data, Samsung Securities estimates

Relative market cap: Hankook T&T + Hahn & Co vs HMC



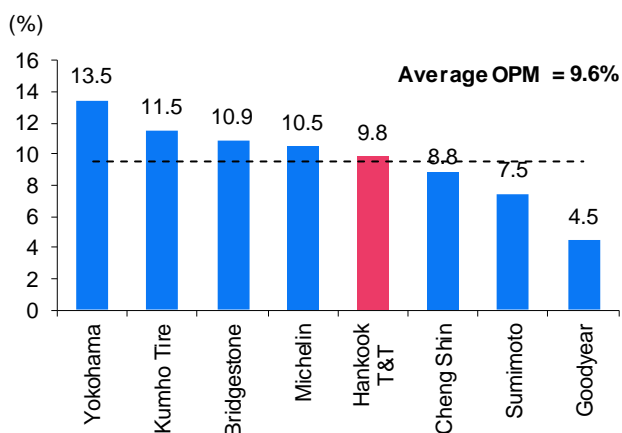
Note: Transitioned to a holding company structure in 2012;
Hankook T&T was Hahn & Co before 2
Source: Bloomberg, Samsung Securities

Hankook T&T: Global capacity and utilization rates

Capacity (mil units)	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025E	2026E
Korea	42	42	42	40	40	38	38	31	31	31	31
China	30	30	30	30	28	28	28	28	28	28	28
Hungary	18	18	18	18	18	18	18	18	18	18	22
Indonesia	11	11	11	11	11	11	11	11	11	11	11
US	0	0	0	5	5	5	5	5	5	10	12
Global total	101	101	101	104	102	100	100	93	93	98	104
Chg (% y-y)	-	-	-	3	-1.9	-2	-	-7	-	5.4	6.1
Utilization (%)	96	95	96	86	79	83	88	95	98	98	98

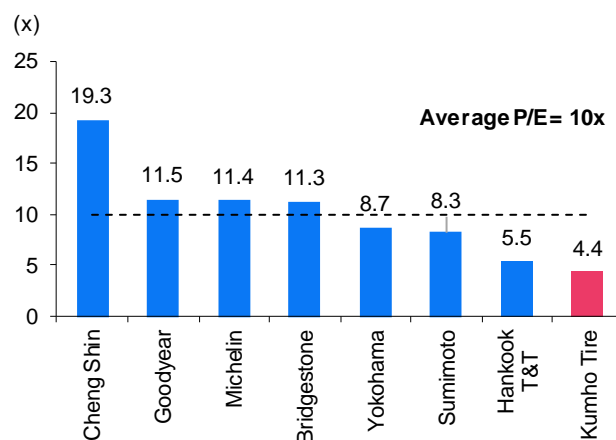
Source: Company data, Samsung Securities estimates

Global tire makers: Operating margin (12m forward)



Source: Bloomberg, Samsung Securities

Global tire makers: 12m forward P/E valuation



Source: Bloomberg, Samsung Securities

Income statement

Year-end Dec 31 (KRWb)	2024	2025	2026E	2027E	2028E
Sales	9,412	21,202	22,031	22,948	23,891
Cost of goods sold	5,944	16,537	16,958	17,420	17,943
Gross profit	3,468	4,665	5,074	5,528	5,948
Gross margin (%)	36.8	22.0	23.0	24.1	24.9
SG&A expenses	1,706	2,824	3,116	3,270	3,516
Operating profit	1,762	1,841	1,958	2,258	2,432
Operating margin (%)	18.7	8.7	8.9	9.8	10.2
Non-operating gains (losses)	-188	-402	-280	-280	-250
Financial profit	220	356	139	181	233
Financial costs	145	541	487	497	505
Equity-method gains (losses)	-93	76	3	3	3
Other	-170	-292	65	33	20
Pre-tax profit	1,574	1,439	1,678	1,978	2,182
Taxes	443	468	455	514	567
Effective tax rate (%)	28.1	32.5	27.1	26.0	26.0
Profit from continuing operations	1,131	972	1,223	1,464	1,615
Profit from discontinued operations	0	0	0	0	0
Net profit	1,131	972	1,223	1,464	1,615
Net margin (%)	12.0	4.6	5.5	6.4	6.8
Net profit (controlling interests)	1,115	1,089	1,137	1,361	1,501
Net profit (non-controlling interests)	16	-118	86	103	114
EBITDA	2,277	3,224	3,354	3,652	3,784
EBITDA margin (%)	24.2	15.2	15.2	15.9	15.8
EPS (parent-based) (KRW)	8,998	8,795	9,175	10,984	12,115
EPS (consolidated) (KRW)	9,131	7,843	9,870	11,817	13,034
Adjusted EPS (KRW)*	8,998	8,795	9,175	10,984	12,115

Cash flow statement

Year-end Dec 31 (KRWb)	2024	2025	2026E	2027E	2028E
Cash flow from operations	1,886	1,608	2,506	2,733	2,839
Net profit	1,131	972	1,223	1,464	1,615
Non-cash profit and expenses	1,359	2,492	2,186	2,210	2,179
Depreciation	497	1,069	1,112	1,136	1,118
Amortization	18	314	284	258	234
Other	844	1,109	790	817	827
Changes in A/L from operating activities	-284	-1,004	-110	-121	-125
Cash flow from investments	-2,610	-735	-1,416	-1,318	-1,018
Change in tangible assets	-1,025	-2,039	-1,400	-1,300	-1,000
Change in financial assets	-146	395	-16	-18	-18
Other	-1,439	909	0	0	0
Cash flow from financing	182	-214	-192	-234	-419
Change in debt	1,063	4,486	113	169	69
Change in equity	0	-113	0	0	0
Dividends	-159	-344	-305	-403	-488
Other	-722	-4,243	0	0	-0
Change in cash	-362	721	938	1,176	1,396
Cash at beginning of year	2,244	1,882	2,603	3,542	4,717
Cash at end of year	1,882	2,603	3,542	4,717	6,113
Gross cash flow	2,490	3,464	3,408	3,674	3,793
Free cash flow	853	-500	1,106	1,433	1,839

Note: *Excluding one-off items

**Fully diluted, excluding one-off items

***From companies subject to equity-method valuation

Source: Company data, Samsung Securities estimates

Balance sheet

Year-end Dec 31 (KRWb)	2024	2025	2026E	2027E	2028E
Current assets	7,275	11,553	12,836	14,393	16,180
Cash & equivalents	1,882	2,603	3,542	4,717	6,113
Accounts receivable	1,862	3,583	3,723	3,878	4,037
Inventories	2,384	3,905	4,058	4,227	4,400
Other current assets	1,147	1,461	1,513	1,571	1,630
Fixed assets	8,575	15,095	15,111	15,032	14,694
Investment assets	2,046	455	468	481	496
Tangible assets	4,693	9,924	10,212	10,377	10,258
Intangible assets	250	3,736	3,452	3,194	2,961
Other long-term assets	1,586	979	979	979	979
Total assets	15,850	26,647	27,947	29,424	30,874
Current liabilities	3,687	6,775	6,547	6,893	7,145
Accounts payable	538	1,695	1,761	1,834	1,910
Short-term debt	977	1,492	1,592	1,692	1,692
Other current liabilities	2,171	3,588	3,194	3,367	3,543
Long-term liabilities	968	5,670	6,235	6,305	6,377
Bonds & long-term debt	147	3,008	3,518	3,528	3,538
Other long-term liabilities	821	2,662	2,716	2,777	2,839
Total liabilities	4,655	12,445	12,782	13,198	13,522
Owners of parent equity	11,100	12,105	12,982	13,940	14,953
Capital stock	62	62	62	62	62
Capital surplus	3,007	2,894	2,894	2,894	2,894
Retained earnings	7,354	8,139	8,970	9,928	10,941
Other	677	1,011	1,056	1,056	1,056
Non-controlling interests' equity	94	2,096	2,183	2,286	2,400
Total equity	11,195	14,202	15,165	16,226	17,353
Net debt	-349	3,834	2,997	1,978	638

Financial ratios

Year-end Dec 31	2024	2025	2026E	2027E	2028E
Growth (%)					
Sales	5.3	125.3	3.9	4.2	4.1
Operating profit	32.7	4.5	6.4	15.3	7.7
Net profit	55.2	-14.1	25.8	19.7	10.3
Adjusted EPS**	54.8	-2.3	4.3	19.7	10.3
Per-share data (KRW)					
EPS (parent-based)	8,998	8,795	9,175	10,984	12,115
EPS (consolidated)	9,131	7,843	9,870	11,817	13,034
Adjusted EPS**	8,998	8,795	9,175	10,984	12,115
BVPS	90,995	99,234	106,421	114,275	122,577
DPS (common)	2,000	2,300	3,300	4,000	4,000
Valuations (x)					
P/E***	4.3	6.6	6.7	5.6	5.1
P/B***	0.4	0.6	0.6	0.5	0.5
EV/EBITDA	2.0	4.1	3.8	3.3	2.8
Ratios (%)					
ROE	10.8	9.4	9.1	10.1	10.4
ROA	7.9	4.6	4.5	5.1	5.4
ROIC	16.8	9.2	7.8	9.0	9.7
Payout ratio	21.9	25.8	35.4	35.9	32.5
Dividend yield (common)	5.2	3.9	5.3	6.5	6.5
Net debt to equity	-3.1	27.0	19.8	12.2	3.7
Interest coverage (x)	39.7	5.7	4.0	4.5	4.8

COMPANY UPDATE

2026. 5. 26

EV/Mobility Team

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▶ AT A GLANCE

BUY

Target price **KRW80,000** 27%

Current price **KRW63,000**

Market cap KRW3.0t/USD2.0b

Shares (float) 46,957,120 (68.3%)

52-week high/low KRW71,400/KRW32,650

Avg daily trading value (60-day) KRW28.9b/
USD19.1m

▶ ONE-YEAR PERFORMANCE

	1M	6M	12M
HL Mando (%)	15.6	60.1	89.5
Vs Kospi (%pts)	-5.5	-21.4	-37.4

▶ KEY CHANGES

(KRW)	New	Old	Diff
Recommend.	BUY	BUY	
Target price	80,000	80,000	0.0%
2026E EPS	5,118	5,118	0.0%
2027E EPS	6,869	6,869	0.0%

▶ SAMSUNG vs THE STREET

No of estimates	23
Target price	75,500
Recommendation	3.9

※ Rating: 4 ← → BUY, 3 = HOLD, 2 → → SELL



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HL Mando (204320)

A key beneficiary of the second EV wave and robotics ecosystem

- Elevated oil prices and advances in autonomous-driving technology have triggered a second wave of EV adoption. At HL Mando, EV components accounted for to 31.5% of sales in 2025 (and a projected 36.5% this year), up from just 8.3% in 2020.
- As the autonomous-driving market expands, HL Mando is benefiting from German competitors' struggles. Its order momentum has strengthened since 2023, and the company has begun supplying products that use its by-wire technology.
- With the automotive industry undergoing a transformative shift toward mobility, HL Mando is positioned as a top-tier player in smart chassis and robotic actuators.

WHAT'S THE STORY?

Raising target price: We raise our target price by 6.6% to KRW80,000. HL Mando has entered an earnings recovery phase, supported by rising EV demand. Amid intensifying pressure on competitors, the company has won more orders for its Integrated Dynamic Brake (IDB) systems and has begun securing contracts for X-by-wire products.

- **Differentiation from global competitors:** Our new target price is derived by applying a target P/E multiple of 13.5x (up 17% from our previous multiple) to the average of our 2026 and 2027 EPS forecasts. The multiple represents a 10% premium to the average at which global electrical/electronic parts makers are trading (Bloomberg), reflecting HL Mando's growth potential in the software-defined vehicle (SDV) era and its expanding robot actuator business.

(Continued on the next page)

SUMMARY FINANCIAL DATA

	2025	2026E	2027E	2028E
Revenue (KRWb)	9,455	9,926	10,556	11,284
Operating profit (KRWb)	357	424	501	557
Net profit (adj) (KRWb)	123	256	343	388
EPS (adj) (KRW)	2,130	5,118	6,869	7,777
EPS (adj) growth (% y-y)	-23.0	140.2	34.2	13.2
EBITDA margin (%)	7.6	7.6	7.4	7.1
ROE (%)	3.8	8.5	10.5	10.9
P/E (adj) (x)	27.6	12.3	9.2	8.1
P/B (x)	1.0	1.0	0.9	0.8
EV/EBITDA (x)	5.8	5.3	4.4	3.8
Dividend yield (%)	1.3	1.9	2.2	2.2

Source: Company data, Samsung Securities estimates

- **Chassis manufacturers' fortunes diverging in this industrial transition:** HL Mando is beating German component suppliers Bosch and Continental in securing orders for IDB and X-by-wire products.
- **Bosch and Continental face profitability challenges:** In 2025, Bosch recorded automotive parts sales of USD63.1b, up 4.6% y-y, ranking as the world's largest parts maker, while Continental (Aumovio) posted sales of USD21b, down 1.3% y-y, ranking eighth globally. Bosch and Continental were both leaders in electrified braking and steering systems for ICE vehicles. Since the pandemic, however, their earnings have declined in tandem with those of their key European automotive customers, and they are losing their once-leading technological positions. Bosch's operating margin fell to 1.8% in 2025, roughly half its pre-pandemic level. Continental spun off its automotive parts division into a separate entity, Aumovio, and continues to restructure, yet Aumovio remains loss-making.
- **Restructuring at European automakers:** Volkswagen has cut production by 730,000 vehicles and laid off 50,000 workers, while winding down its software subsidiary Cariad. Stellantis is exploring the sale of its European plants to Chinese manufacturers. BMW and Benz are struggling with weak earnings. In every case, these difficulties reflect their technological lag behind Chinese EV makers, which has eroded sales in both China and Europe.

Second wave of EV adoption now gaining momentum: EV demand is growing across all markets worldwide—except the US, where demand is likely to recover after September.

- **Autonomous driving is accelerating the next EV wave:** The auto industry is entering a new phase, with Level 2+ and higher autonomous systems increasingly integrated into mainstream consumer vehicles, while robotaxis expand rapidly in some major cities. A North American EV manufacturer is seeing consistent quarterly growth in subscription additions for autonomy features. GM also reported a 40% adoption rate for its highway-level driver assistance in North America.

EVs are uniquely inherently suited for advanced autonomy, offering superior energy efficiency and faster real-time response to AI-driven controls. As consumer demand for these capabilities grows, it should further drive EV adoption.

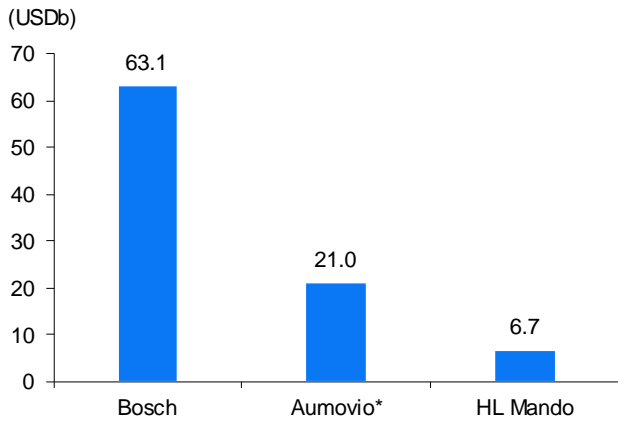
- **Smart chassis sales and orders expanding:** Higher utilization at HL Mando's Mexico plant, which produces IDB systems, is boosting profitability. The company has also secured orders to supply steer-by-wire (SbW) products for robotaxi systems.
- **ADAS sales growing:** HL Mando's ADAS sales to Hyundai Motor Group, which had slowed amid competition from Hyundai Mobis, have returned to an uptrend on rising demand from India since 2025.

Confident in attracting customers for robot actuator business: HL Mando should differentiate itself from Chinese competitors by leveraging its strengths in durability, quality, sourcing capabilities, North American manufacturing, and established customer relationships.

- **Humanoid robot market outlook:** The global humanoid robot market is projected to grow from KRW2t in 2025 to KRW445t by 2035. Actuators are estimated to account for 44% of total manufacturing costs. HL Mando aims to capture a 10% share of the robotic actuator segment, achieving KRW2.3t in annual sales.

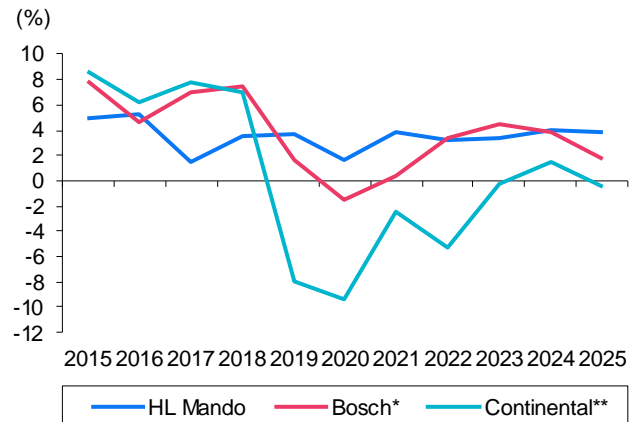
- **Roadmap:**
 - 2024-2025:** Complete development of three master models and nine product-line specifications.
 - 2026:** Conduct technical validation (proof of concept) and pilot evaluations with key customers, internalize core technologies, and pursue M&As and JVs to secure foundational technologies.
 - 2027-2028:** Secure orders domestically and overseas, and begin pilot production in North America.
 - 2029:** Scale up mass-production in North America and Korea.
- **Weaknesses of Chinese actuators:** While Chinese actuators offer cost advantages, they suffer from lower durability and high component fatigue. They may be suitable for early-stage humanoid robot prototypes, but mass-production should require tier-1 suppliers with comprehensive system-integration capabilities.
- **Competitive advantages:** We highlight four of HL Mando's major competitive advantages. First, six decades of experience in automotive control systems have established deep trust in the durability and quality of its products. Second, the firm has fully internalized core technologies for motors and sensors. For gearboxes, design capabilities are in-house, while high-precision harmonic drives are currently sourced from Japan's Harmonic Drive Systems—strategic M&As and JVs are underway to achieve full technology ownership. Third, the firm boasts strong, long-term partnerships with leading physical-AI pioneers, including a top North American EV manufacturer (13 years) and a leading Chinese SDV innovator (6 years), ensuring close alignment with customer roadmaps and technical requirements. Fourth, localized production and supply chain infrastructure in North America provide a strategic advantage in an era of escalating geopolitical risks.

Global chassis companies: Revenue (2025)



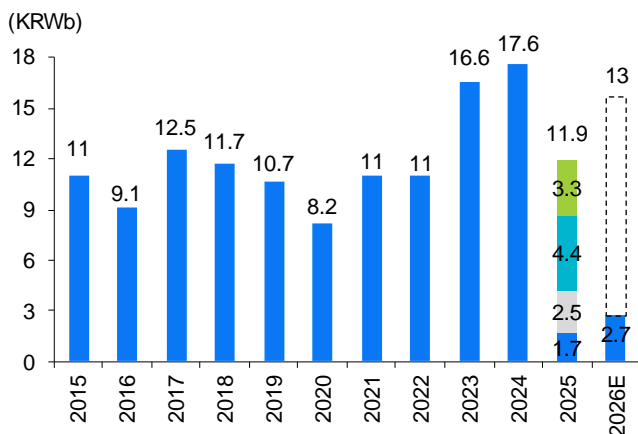
Note: *Spun off from Continental's automotive unit in 2025
Source: Bloomberg, Samsung Securities

Global chassis companies: Operating margin



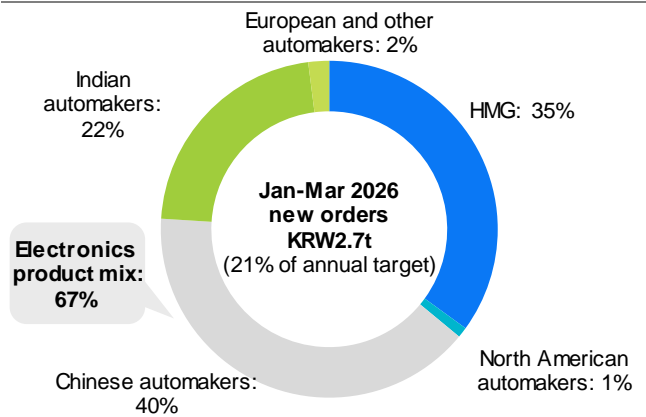
Note: *Automotive division;
**Automotive Group division (~2022), Aumovio (2023~)
Source: Bloomberg, Samsung Securities

HL Mando: New orders and guidance



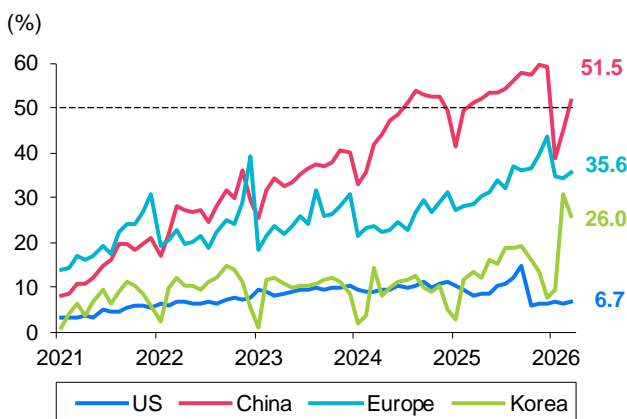
Source: Company data, Samsung Securities

HL Mando: New orders, by client



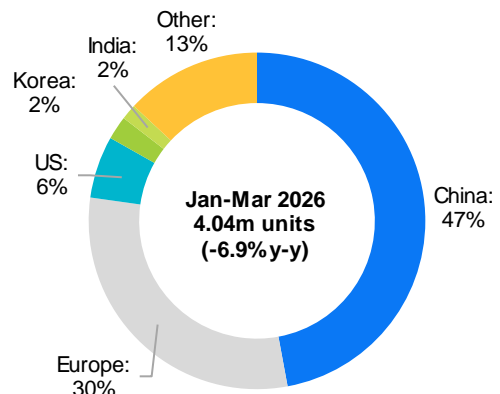
Source: Company data, Samsung Securities

EV penetration, by country and region



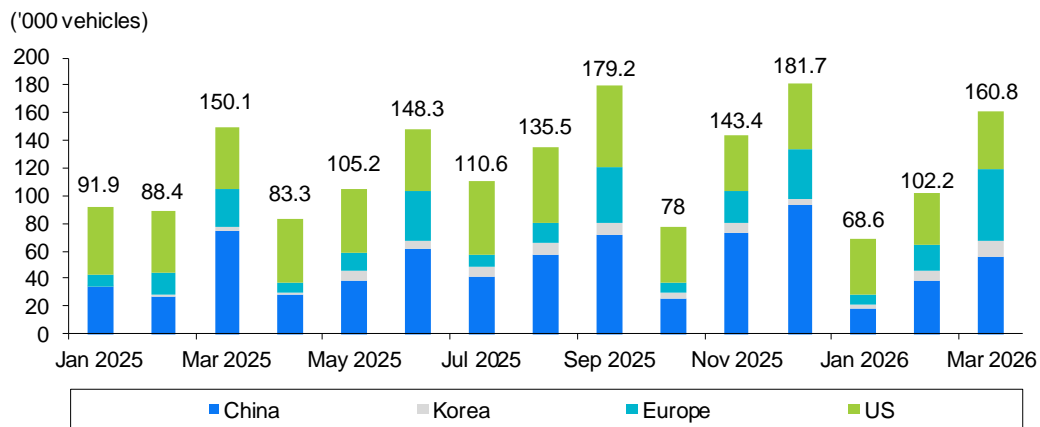
Source: EV-Volumes, Samsung Securities

Global EV demand portion, by country



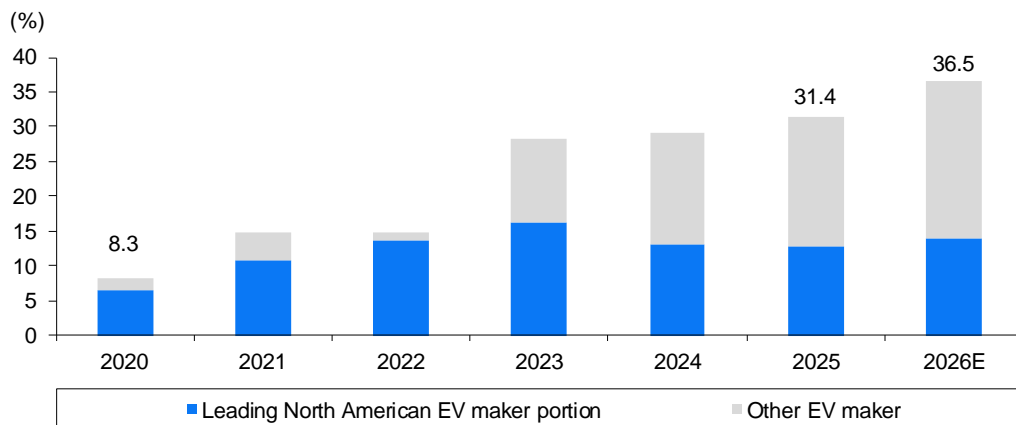
Source: EV-Volumes, Samsung Securities

Leading North American EV maker: Sales volume, by region



Source: CPCA, ACEA, KAIDA, Wards, Samsung Securities

HL Mando: EV component portion of sales



Source: Company data, Samsung Securities

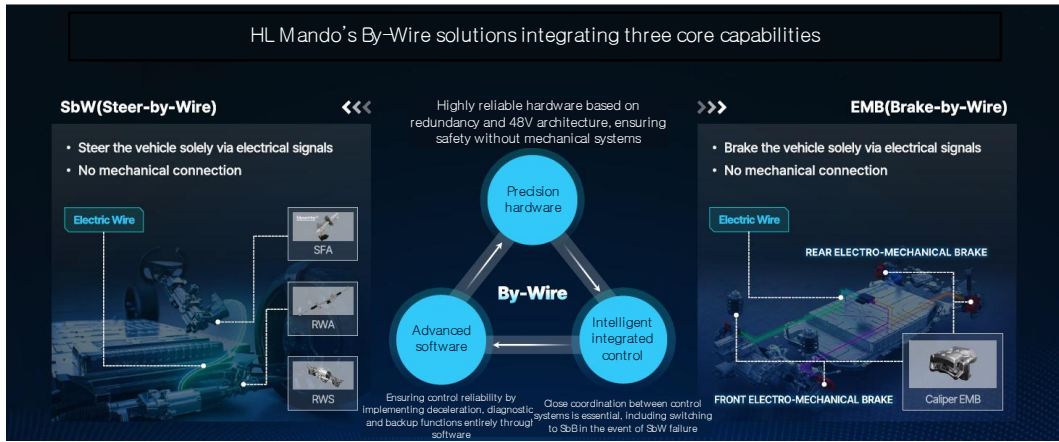
HL Mando: Robotaxi customer portfolio

		Brake	Steering	Suspension
China	Leading Chinese IT OEM	✓	✓ (SbW; new business win)	✓ (Secured in Apr 2026)
	Leading Chinese IT company B		✓	✓
US	Leading N. American EV maker	✓	✓	✓
	N. American Big Tech subsidiary A	✓	✓ (SbW)	
	Waymo	✓	✓	✓

Note: As of 1Q26

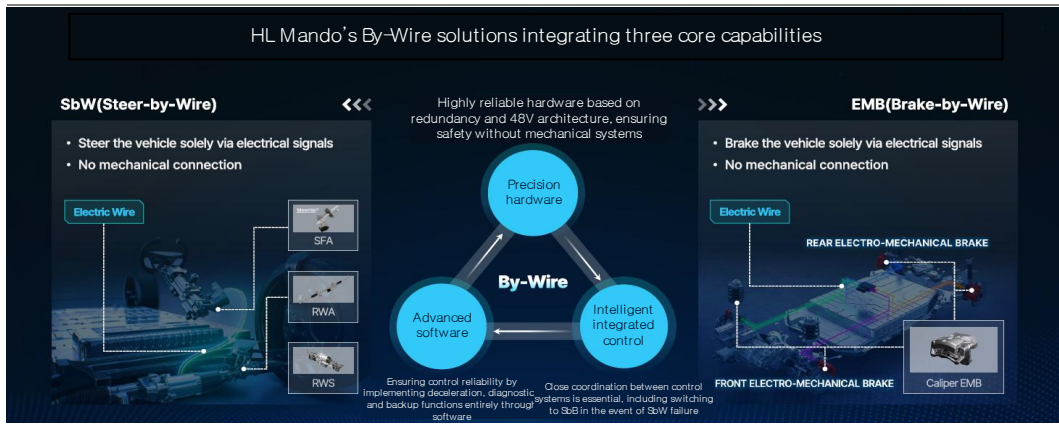
Source: Company data, Samsung Securities

HL Mando: By-wire solutions



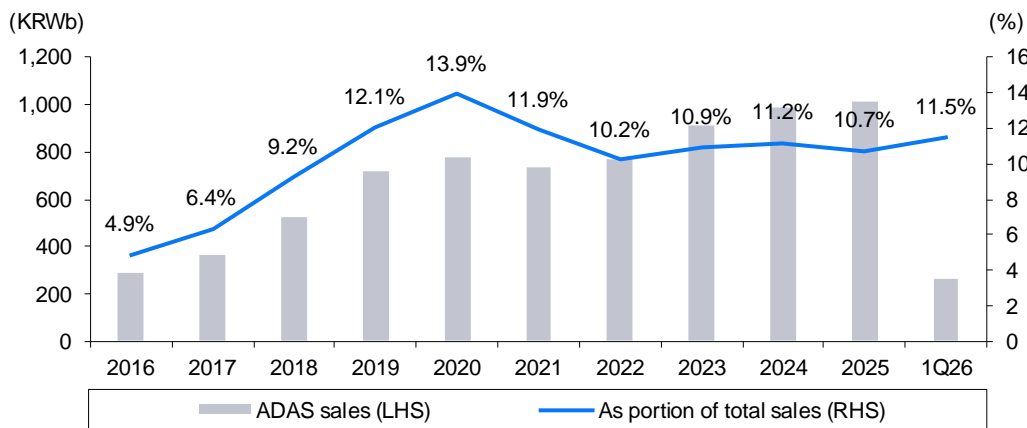
Source: Company data

HL Mando: SDV ecosystem and customer landscape



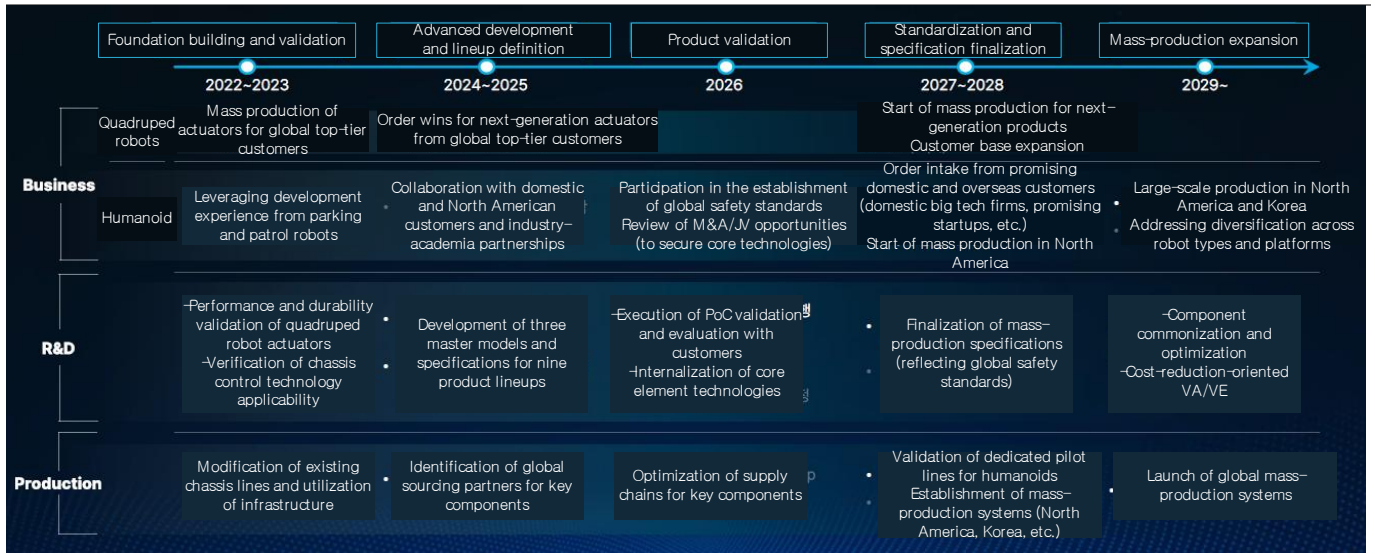
Source: Company data

HL Mando: ADAS sales



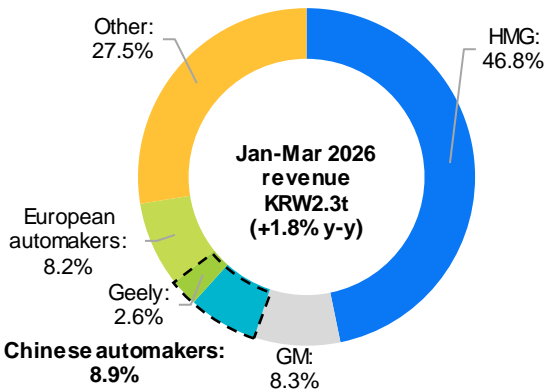
Source: Company data, Samsung Securities

HL Mando: Robot actuator business roadmap



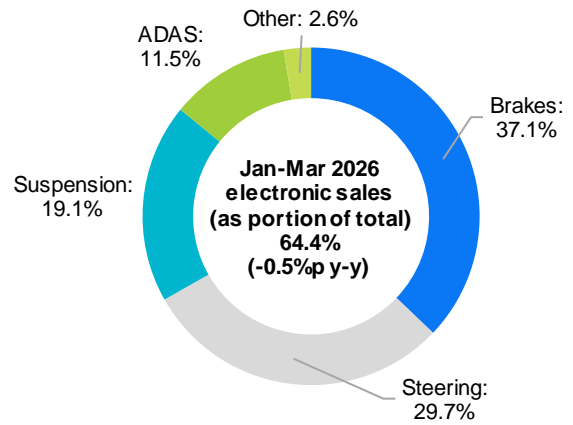
Source: Company data

HL Mando: Sales, by client



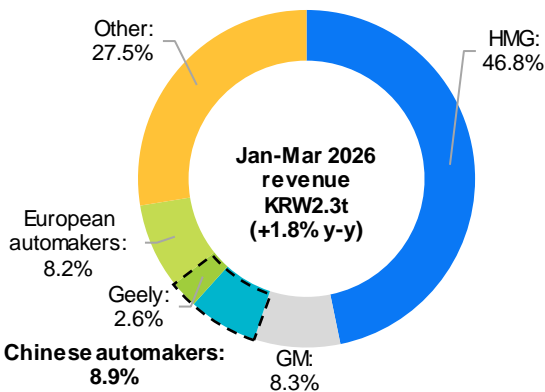
Source: Company data, Samsung Securities

HL Mando: Sales, by product



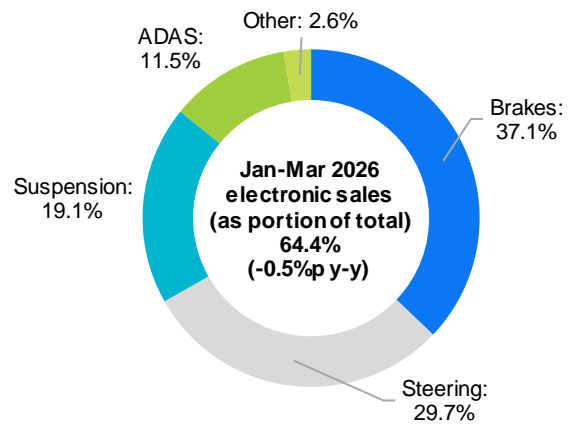
Source: Company data, Samsung Securities

HL Mando China: Sales, by client



Source: Company data, Samsung Securities

China: Auto exports



Source: Company data, Samsung Securities

HL Mando: Result and forecasts

(KRWb)	1Q25	2Q25	3Q25	4Q25	1Q26	2Q26E	3Q26E	4Q26E	2024	2025	2026E	2027E
KRW/USD (avg)	1,453	1,401	1,387	1,452	1,467	1,450	1,430	1,420	1,365	1,423	1,442	1,390
Sales	2,271	2,401	2,321	2,462	2,312	2,484	2,546	2,585	8,848	9,455	9,926	10,556
Chg (% y-y)	7.8	11.8	6.9	1.6	1.8	3.4	9.7	5.0	5.4	6.9	5.0	6.3
Gross profit	320	365	362	397	361	338	357	584	1,323	1,444	1,641	1,799
Operating profit	79	104	94	80	94	105	116	109	359	357	424	501
Chg (% y-y)	4.7	16.2	14.1	-28.2	18.2	0.8	22.8	37.2	28.5	-0.5	18.6	18.2
Operating profit	62	34	66	56	86	85	100	86	265	218	356	458
Net profit	35	10	49	29	53	64	75	64	158	123	256	343
Controlling profit	28	4	44	24	48	60	70	60	130	100	240	323
Margins (%)												
Gross profit	14.1	15.2	15.6	16.1	15.6	13.6	14.0	22.6	15.0	15.3	16.5	17.0
Operating profit	3.5	4.3	4.1	3.2	4.0	4.2	4.5	4.2	4.1	3.8	4.3	4.7
Net profit	1.5	0.4	2.1	1.2	2.3	2.6	2.9	2.5	1.8	1.3	2.6	3.3
Controlling profit	1.2	0.2	1.9	1.0	2.1	2.4	2.8	2.3	1.5	1.1	2.4	3.1

Source: Company data, Samsung Securities estimates

Income statement

Year-end Dec 31 (KRWb)	2024	2025	2026E	2027E	2028E
Sales	8,848	9,455	9,926	10,556	11,284
Cost of goods sold	7,525	8,011	8,285	8,756	9,336
Gross profit	1,323	1,444	1,641	1,799	1,949
Gross margin (%)	15.0	15.3	16.5	17.0	17.3
SG&A expenses	964	1,087	1,217	1,299	1,392
Operating profit	359	357	424	501	557
Operating margin (%)	4.1	3.8	4.3	4.7	4.9
Non-operating gains (losses)	-93	-139	-67	-43	-39
Financial profit	56	51	19	22	37
Financial costs	138	145	87	71	71
Equity-method gains (losses)	-5	-3	4	5	5
Other	-6	-42	-3	0	-10
Pre-tax profit	265	218	356	458	518
Taxes	107	95	100	114	129
Effective tax rate (%)	40.4	43.6	28.2	25.0	25.0
Profit from continuing operations	158	123	256	343	388
Profit from discontinued operations	0	0	0	0	0
Net profit	158	123	256	343	388
Net margin (%)	1.8	1.3	2.6	3.3	3.4
Net profit (controlling interests)	130	100	240	323	365
Net profit (non-controlling interests)	28	23	15	21	23
EBITDA	694	718	753	782	797
EBITDA margin (%)	7.8	7.6	7.6	7.4	7.1
EPS (parent-based) (KRW)	2,767	2,130	5,118	6,869	7,777
EPS (consolidated) (KRW)	3,370	2,615	5,445	7,308	8,273
Adjusted EPS (KRW)*	2,767	2,130	5,118	6,869	7,777

Cash flow statement

Year-end Dec 31 (KRWb)	2024	2025	2026E	2027E	2028E
Cash flow from operations	435	721	548	579	572
Net profit	158	123	256	343	388
Non-cash profit and expenses	532	632	491	435	395
Depreciation	302	323	298	255	218
Amortization	33	38	32	27	22
Other	197	271	161	154	154
Changes in A/L from operating activities	-163	67	-34	-41	-52
Cash flow from investments	-397	-364	-153	-4	-4
Change in tangible assets	-307	-333	-150	0	0
Change in financial assets	12	28	-3	-4	-4
Other	-103	-59	-0	0	0
Cash flow from financing	-177	-96	-693	-56	-66
Change in debt	10	-129	-658	0	0
Change in equity	0	0	0	0	0
Dividends	-51	-52	-35	-56	-66
Other	-136	85	-0	0	0
Change in cash	-79	264	-287	522	505
Cash at beginning of year	615	536	800	513	1,035
Cash at end of year	536	800	513	1,035	1,540
Gross cash flow	690	755	747	778	783
Free cash flow	125	377	398	579	572

Note: *Excluding one-off items;

**Fully diluted, excluding one-off items;

***From companies subject to equity-method valuation

Source: Company data, Samsung Securities estimates

Balance sheet

Year-end Dec 31 (KRWb)	2024	2025	2026E	2027E	2028E
Current assets	3,677	3,719	3,578	4,291	5,021
Cash & equivalents	536	800	513	1,035	1,541
Accounts receivable	2,020	1,859	1,952	2,076	2,219
Inventories	838	804	845	898	960
Other current assets	283	256	269	282	301
Fixed assets	3,375	3,417	3,240	2,962	2,727
Investment assets	235	222	225	229	233
Tangible assets	2,410	2,560	2,412	2,157	1,940
Intangible assets	220	229	197	170	148
Other long-term assets	510	406	406	406	406
Total assets	7,052	7,137	6,818	7,253	7,747
Current liabilities	2,900	3,047	2,492	2,629	2,788
Accounts payable	1,449	1,399	1,468	1,562	1,669
Short-term debt	233	331	331	331	331
Other current liabilities	1,218	1,317	693	736	787
Long-term liabilities	1,479	1,214	1,222	1,233	1,246
Bonds & long-term debt	1,176	966	966	966	966
Other long-term liabilities	303	248	256	267	280
Total liabilities	4,379	4,261	3,714	3,862	4,033
Owners of parent equity	2,519	2,714	2,927	3,193	3,493
Capital stock	47	47	47	47	47
Capital surplus	603	603	603	603	603
Retained earnings	1,237	1,311	1,516	1,782	2,082
Other	631	752	760	760	760
Non-controlling interests' equity	154	162	177	198	221
Total equity	2,673	2,876	3,104	3,391	3,714
Net debt	1,585	1,218	846	323	-184

Financial ratios

Year-end Dec 31	2024	2025	2026E	2027E	2028E
Growth (%)					
Sales	5.4	6.9	5.0	6.3	6.9
Operating profit	28.5	-0.5	18.6	18.2	11.3
Net profit	2.4	-22.4	108.2	34.2	13.2
Adjusted EPS**	-4.2	-23.0	140.2	34.2	13.2
Per-share data (KRW)					
EPS (parent-based)	2,767	2,130	5,118	6,869	7,777
EPS (consolidated)	3,370	2,615	5,445	7,308	8,273
Adjusted EPS**	2,767	2,130	5,118	6,869	7,777
BVPS	53,635	57,793	62,333	68,002	74,379
DPS (common)	700	750	1,200	1,400	1,400
Valuations (x)					
P/E***	14.7	27.6	12.3	9.2	8.1
P/B***	0.8	1.0	1.0	0.9	0.8
EV/EBITDA	5.3	5.8	5.3	4.4	3.8
Ratios (%)					
ROE	5.5	3.8	8.5	10.5	10.9
ROA	2.4	1.7	3.7	4.9	5.2
ROIC	5.7	5.1	7.9	10.2	12.0
Payout ratio	25.3	35.2	23.4	20.4	18.0
Dividend yield (common)	1.7	1.3	1.9	2.2	2.2
Net debt to equity	59.3	42.4	27.3	9.5	-5.0
Interest coverage (x)	3.2	3.3	4.8	7.1	7.9

COMPANY UPDATE

2026. 5. 26

EV/Mobility Team

Esther Yim

Team Leader

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Hyunji Kim

Research Associate

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▶ AT A GLANCE

BUY

Target price **KRW93,000** **22.7%**

Current price **KRW75,800**

Market cap KRW3.5t/USD2.3b

Shares (float) 46,448,520 (36.2%)

52-week high/low KRW75,800/KRW30,050

Avg daily trading value (60-day) KRW16.5b/
USD10.9m

▶ ONE-YEAR PERFORMANCE

	1M	6M	12M
SL Corporation (%)	18.4	110.0	149.3
Vs Kospi (%pts)	-3.1	3.1	-17.6

▶ KEY CHANGES

(KRW)	New	Old	Diff
Recommend.	BUY	BUY	
Target price	93,000	93,000	0.0%
2026E EPS	8,459	8,459	0.0%
2027E EPS	9,382	9,283	1.1%

▶ SAMSUNG vs THE STREET

No of estimates	8
Target price	89,750
Recommendation	4.0

※ Rating: 4 < → BUY, 3 = HOLD, 2 > → SELL



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SL Corporation (005850)

NDR takeaways: Doubling down on robot orders

- Strong sales of the Palisade (HMC) and Telluride (Kia) helped SL Corp record an operating margin of 10.4% in 1Q. The ASP for lamps used in large SUVs is in the KRW0.4m-0.5m range, which is 60% higher than the price of lamps used in the Tucson. SL Corp also supplies lamps for Genesis models.
- SL Corp took orders of KRW477.3b over January-April, achieving 30% of its full-year target of KRW1.6t. It has secured contracts to supply lamps to GM, provide battery management systems (BMS) for four new Hyundai Motor and Kia EV models, and perform contract manufacturing for the PluD mobile robot (which is made by Hyundai Motor Group Robotic Lab).
- SL Corp provides the battery packs, lidar modules, and contract manufacturing for PluD, just as it does for MobED. Negotiations related to component orders for Atlas are currently underway.

WHAT'S THE STORY?

LED lamps and enhanced functions support margins: Hyundai Motor (HMC) and Kia have adopted LED lamps across all of their models. By adding daytime running lights, turn signals, multi-focus reflectors (MFR), and projection functions, lamp ASPs have risen 40-60% vs previous generation lamps.

- **ASP of headlamps used in second-generation Palisade and Telluride KRW430,000:** These are projection-type LED lamps (using a combination of reflectors and condenser lenses to focus the light forwards), incorporating daytime running lights and turn-signal functions. The ASP is 40% higher than that of headlamps used in the first-generation Palisade and Telluride models and 60% higher than that of the equivalent headlamp used in the Tucson.

With the addition of hybrid trims, the sales volume of the second-generation Palisade and Telluride is likely to rise 50% vs sales of the first-generation models.

(Continued on the next page)

SUMMARY FINANCIAL DATA

	2025	2026E	2027E	2028E
Revenue (KRWb)	5,240	5,712	6,226	6,661
Operating profit (KRWb)	407	461	519	560
Net profit (adj) (KRWb)	321	404	448	478
EPS (adj) (KRW)	6,692	8,459	9,382	10,021
EPS (adj) growth (% y-y)	-15.6	26.4	10.9	6.8
EBITDA margin (%)	10.9	10.9	10.9	10.8
ROE (%)	12.8	14.6	14.8	14.4
P/E (adj) (x)	6.4	9.0	8.1	7.6
P/B (x)	0.8	1.2	1.1	1.0
EV/EBITDA (x)	3.4	5.2	4.5	4.0
Dividend yield (%)	6.5	4.6	4.9	4.9

Source: Company data, Samsung Securities estimates

- **Highest sustainable profitability within value chain:** As SL Corp also supplies headlamps for all HMC Genesis models, its ASP is likely to continue rising.

Diversification of order portfolio: SL Corp took orders of KRW477.3b over January-April, achieving 30% of its full-year target.

- **Increased orders from GM:** SL Corp has won orders from GM to supply head lamps and rear lamps for the Enclave (a large SUV) as well as mirrors for the Camaro and CT5. GM is currently reorganizing its ICE vehicle lineup following the cancellation of its EV projects.
- **Lamps for HMC SDVs:** SL Corp has secured orders to provide head lamps and rear lamps for HMC's SDVs that will be sold in Korea and Europe, which SDVs are set to be launched in 2028.
- **BMS orders:** SL Corp should supply battery management systems (BMS) for the second-generation Casper EV (HMC; to hit the market in 2028) and three upcoming Kia EV models. Under Hyundai Motor Group's (HMG) dual-sourcing policy, both SL Corp and Hyundai Mobis provide BMS and side-body control modules to the group. SL Corp began to supply BMS for use in Kia's EV3 and EV4 in 2024. It also provides BMS for HMG Robotics Lab's mobile robots.

Robot sales to begin from Jul 2026: The company's robot-related sales portion should reach 3% in 2027 and 5% in 2028.

- **Involved in MobED and PluD production:** HMG Robotics Lab aims to produce 10,000-15,000 MobED mobile robots over the next three years. It will likely manufacture a similar amount of PluD (a modular, service-oriented mobile robot with customizable components) and should leverage much of MobED's existing supply chain. SL Corp supplies lidar modules and battery packs for use in the MobED, and serves as the contract manufacturer for MobED and PluD, customizing each unit (including modules mounted on top) to meet specific customer requirements. Mass-production of: 1) MobED should start in Aug 2026; and 2) PluD should commence in Mar 2027. Together, the two robots are expected to add KRW250b-400b to SL Corp's annual sales (or 4.5-7% of its 2026 sales).
- **Participating in Atlas component bidding:** SL Corp is already supplying the leg modules for quadruped robot Spot and the signal lamps for Stretch. Sales related to Spot should begin in Jul 2026. Having a production base in North America and sufficient financial resources needed to develop new technologies, it is well positioned to win additional orders.

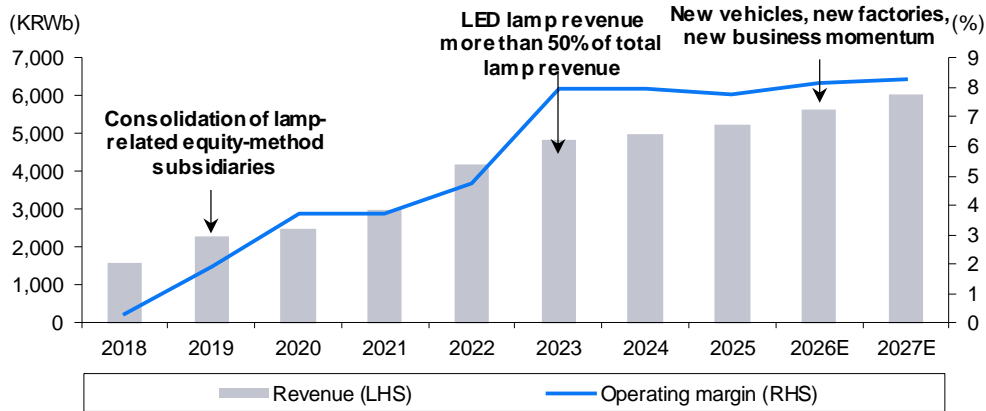
2026 earnings momentum: Benefiting from HMC and Kia's model launches and plant startups, SL Corp's sales are likely to grow at a CAGR of 8% through 2028.

- **2026 outlook:** We expect SL Corp to post 2026 sales of KRW5.7t (up 9%) and an operating profit of KRW460.8b (up 13.2%), for an operating margin of 8.1%. Sales should pick up as HMG launches new models, HMG's global plant utilization rises, and the robotics market expands. Higher lamp ASPs and a recovery of tariff costs should further improve its profitability.
- **New-car momentum from HMC and Kia in 2026:** SL Corp's orders began to surge in 2023, and the impact of this on earnings should be seen from 2026. The firm supplies headlamps and rear lamps for the Ioniq 9; headlamps for the EV4; and headlamps and rear lamps for the Kia Telluride.

For the Palisade Hybrid that is assembled at Hyundai Motor Group Metaplant America (HMGMA), it supplies headlamps, grille lamps, and rear lamps.

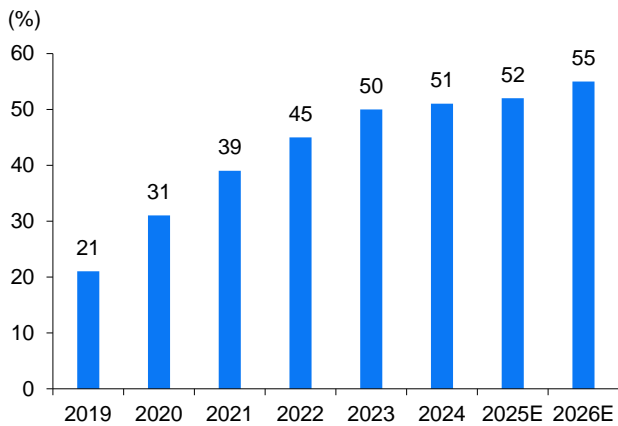
- **HMGMA ramping up utilization; HMC's plant in India comes online:** We see several catalysts that should drive SL Corp's sales higher: 1) HMGMA assembles HMC and Kia hybrids, and it is planning to ramp up output from 60,000 units in 2025 to 200,000 units in 2026; 2) HMC's third plant in India came online in Oct 2025 (capacity: 250,000 units); and 3) a Kia PBV plant came online in Jun 2025 (capacity: 150,000 units). SL Corp supplies all of the lamps for HMG's vehicles in North America and India. It should also provide headlamps, BMS, and side-body control modules for vehicles produced at Kia's PBV plant.
- **Robot sales momentum to offset weak results in 2H:** SL Corp has repeatedly seen strong results in 1H followed by sluggish numbers in 2H. In 2H26, however, such weakness should be counterbalanced by sales related to: 1) Spot (from July); and 2) MobED (from August).

SL Corp: Sales and operating margin



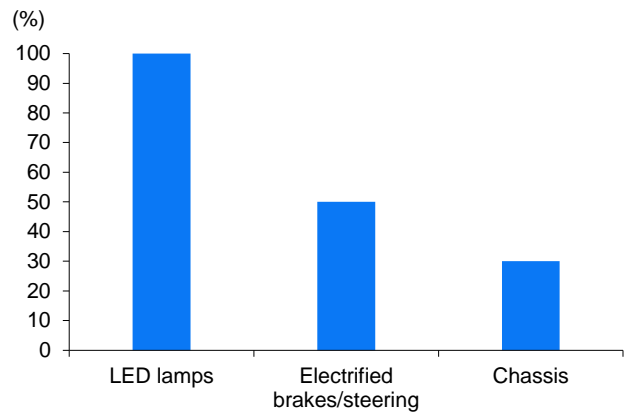
Source: Company data, Samsung Securities

SL Corp: LED lamp sales as portion of total lamp sales



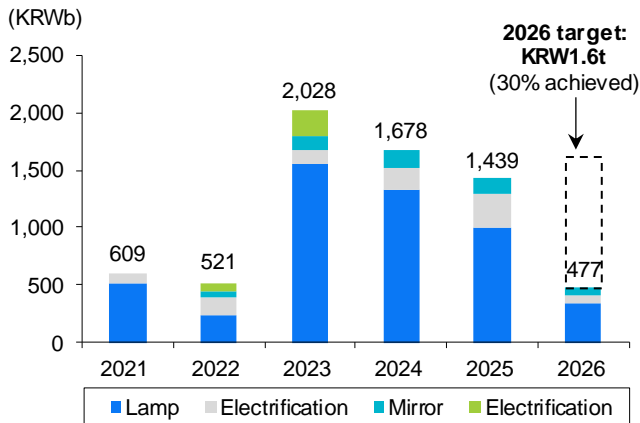
Source: Company data, Samsung Securities

SL Corp: Changes in ASPs for main products



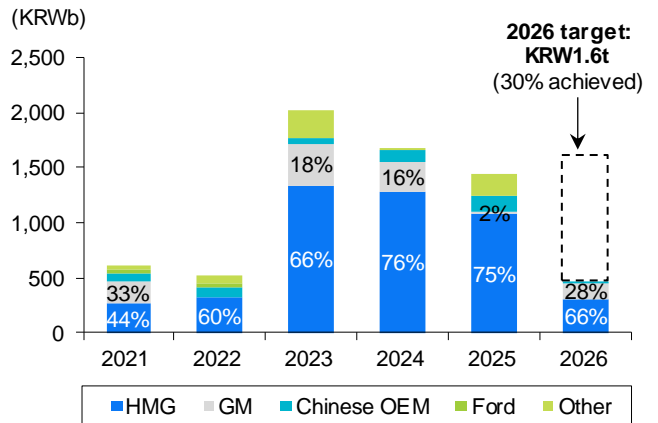
Source: Company data, Samsung Securities estimates

SL Corp: Orders taken, by product



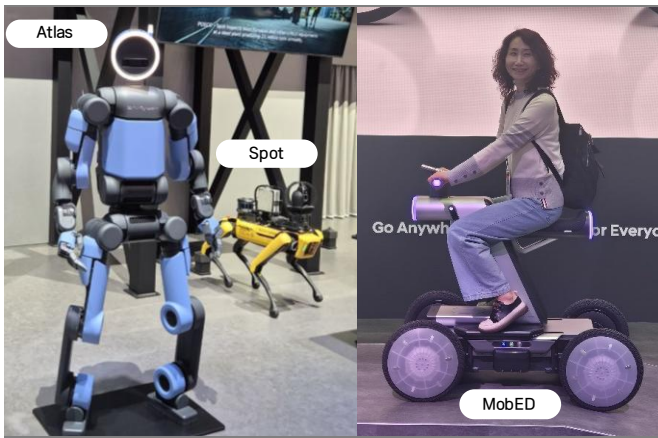
Note: 2026 figures cover Jan-Apr
Source: Company data, Samsung Securities

SL Corp: Orders taken, by client



Note: 2026 figures cover Jan-Apr
Source: Company data, Samsung Securities

Atlas/Spot/MobED



Source: Samsung Securities

SL Corp: HMG's robotics business's core value chain

Company	Product	Supplied by SL Corp
Robotics LAB	MobED	Lidar module
		Battery pack
		Mobile robot production
Boston Dynamics	Stretch	Direction indicator
	Spot	Leg module
	Atlas	Bidding

Source: Samsung Securities

Robotics LAB: PnD (Plug & Drive)



Source: Company data

Robotics LAB: PnD (Plug & Drive)



Source: Company data

SL Corp: Results and forecasts

(KRWb)	1Q25	2Q25	3Q25	4Q25	1Q26	2Q26E	3Q26E	4Q26E	2024	2025	2026E	2027E
KRW/USD (average)	1,453	1,401	1,387	1,452	1,467	1,450	1,430	1,420	1,365	1,423	1,442	1,390
Revenue	1,234	1,295	1,303	1,409	1,388	1,429	1,402	1,492	4,973	5,240	5,712	6,226
Chg (% y-y)	-1.0	-0.3	9.3	13.9	12.5	10.4	7.7	5.9	2.8	5.4	9.0	9.0
Lamp	943	1,043	1,080	1,117	1,088	1,113	1,124	1,150	3,961	4,183	4,475	4,744
Chassis	173	134	163	158	178	161	175	177	543	628	691	726
Other	118	117	60	112	121	156	104	165	470	407	545	756
Gross profit	192	180	150	211	224	215	187	180	689	733	807	897
Operating profit	119	106	68	114	144	137	98	82	395	407	461	519
Chg (% y-y)	-14.1	-28.3	0.9	178.0	20.5	28.9	43.9	-27.7	2.3	3.0	13.2	12.7
Equity method profit	3.8	5.0	2.6	6.3	5.8	6.0	3.4	3.4	16.8	17.7	18.6	18.8
Before tax profit	137	92	94	124	181	141	104	112	487	446	538	597
Net profit	104	70	70	77	136	105	78	84	382	321	404	448
Chg (% y-y)	-14.3	-43.3	21.3	-3.4	30.6	50.2	11.8	9.8	9.4	-16.0	25.8	10.9
Controlling profit	100	69	68	73	132	103	76	82	368	311	393	436
Chg (% y-y)	-14.2	-41.7	21.6	-4.6	32.3	48.3	11.5	11.6	9.8	-15.6	26.4	10.9
Margins (%)												
Gross profit	15.6	13.9	11.5	15.0	16.2	15.0	13.3	12.1	13.8	14.0	14.1	14.4
Operating profit	9.7	8.2	5.2	8.1	10.4	9.6	7.0	5.5	7.9	7.8	8.1	8.3
Before tax profit	11.1	7.1	7.2	8.8	13.1	9.8	7.4	7.5	9.8	8.5	9.4	9.6
Net profit	8.4	5.4	5.4	5.4	9.8	7.4	5.6	5.6	7.7	6.1	7.1	7.2

Source: Company data, Samsung Securities estimates

Income statement

Year-end Dec 31 (KRWb)	2024	2025	2026E	2027E	2028E
Sales	4,973	5,240	5,712	6,226	6,661
Cost of goods sold	4,285	4,507	4,905	5,329	5,692
Gross profit	689	733	807	897	969
Gross margin (%)	13.8	14.0	14.1	14.4	14.5
SG&A expenses	294	326	346	377	409
Operating profit	395	407	461	519	560
Operating margin (%)	7.9	7.8	8.1	8.3	8.4
Non-operating gains (losses)	92	39	78	78	78
Financial profit	33	34	37	44	53
Financial costs	21	15	13	12	12
Equity-method gains (losses)	17	18	19	19	19
Other	63	1	34	27	18
Pre-tax profit	487	446	538	597	638
Taxes	105	125	135	149	160
Effective tax rate (%)	21.6	28.0	25.0	25.0	25.0
Profit from continuing operations	382	321	404	448	478
Profit from discontinued operations	0	0	0	0	0
Net profit	382	321	404	448	478
Net margin (%)	7.7	6.1	7.1	7.2	7.2
Net profit (controlling interests)	368	311	393	436	465
Net profit (non-controlling interests)	14	10	11	12	13
EBITDA	559	570	623	679	717
EBITDA margin (%)	11.2	10.9	10.9	10.9	10.8
EPS (parent-based) (KRW)	7,930	6,692	8,459	9,382	10,021
EPS (consolidated) (KRW)	8,223	6,906	8,690	9,637	10,294
Adjusted EPS (KRW)*	7,930	6,692	8,459	9,382	10,021

Cash flow statement

Year-end Dec 31 (KRWb)	2024	2025	2026E	2027E	2028E
Cash flow from operations	482	509	482	517	556
Net profit	382	321	404	448	478
Non-cash profit and expenses	300	388	230	234	233
Depreciation	153	151	151	151	151
Amortization	11	12	11	9	7
Other	136	225	67	74	76
Changes in A/L from operating activities	-122	-157	-65	-71	-60
Cash flow from investments	-334	-296	-160	-150	-150
Change in tangible assets	-214	-181	-150	-150	-150
Change in financial assets	0	0	0	0	0
Other	-120	-115	-10	0	0
Cash flow from financing	-127	-81	-166	-159	-172
Change in debt	-39	-16	-38	0	0
Change in equity	0	0	0	0	0
Dividends	-46	-60	-128	-159	-173
Other	-41	-5	0	0	0
Change in cash	35	129	156	212	239
Cash at beginning of year	314	348	478	634	845
Cash at end of year	348	478	634	845	1,085
Gross cash flow	681	708	633	681	711
Free cash flow	244	320	332	367	406

Note: *Excluding one-off items

**Fully diluted, excluding one-off items

***From companies subject to equity-method valuation

Source: Company data, Samsung Securities estimates

Balance sheet

Year-end Dec 31 (KRWb)	2024	2025	2026E	2027E	2028E
Current assets	2,346	2,634	2,948	3,332	3,718
Cash & equivalents	348	478	634	845	1,085
Accounts receivable	960	984	1,072	1,169	1,250
Inventories	416	436	475	518	554
Other current assets	622	737	767	801	829
Fixed assets	1,353	1,363	1,376	1,382	1,388
Investment assets	233	245	260	276	289
Tangible assets	861	871	870	869	869
Intangible assets	37	41	39	30	24
Other long-term assets	221	207	207	207	207
Total assets	3,699	3,997	4,324	4,715	5,106
Current liabilities	1,142	1,170	1,210	1,295	1,368
Accounts payable	511	560	610	665	712
Short-term debt	275	261	261	261	261
Other current liabilities	357	349	339	369	395
Long-term liabilities	159	175	190	207	221
Bonds & long-term debt	0	0	0	0	0
Other long-term liabilities	159	175	190	207	221
Total liabilities	1,302	1,345	1,400	1,502	1,589
Owners of parent equity	2,300	2,553	2,814	3,090	3,383
Capital stock	23	23	23	23	23
Capital surplus	460	460	460	460	460
Retained earnings	1,783	2,045	2,310	2,587	2,880
Other	34	25	20	20	20
Non-controlling interests' equity	97	99	110	122	134
Total equity	2,397	2,652	2,923	3,212	3,518
Net debt	-24	-170	-364	-575	-815

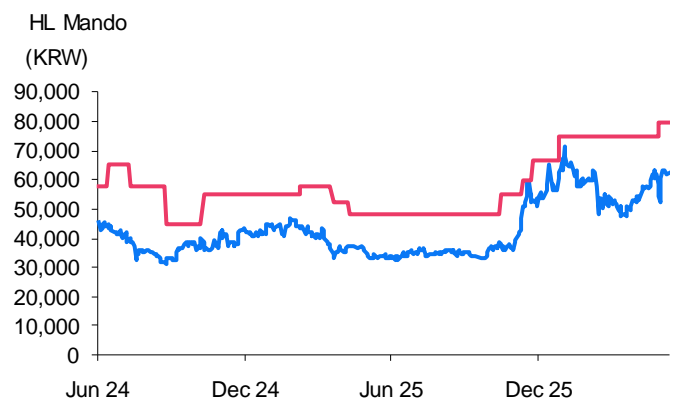
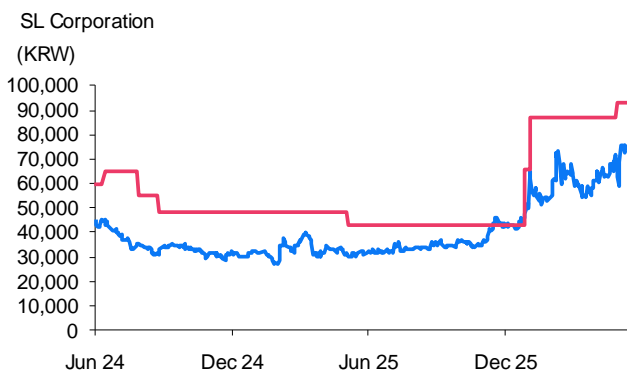
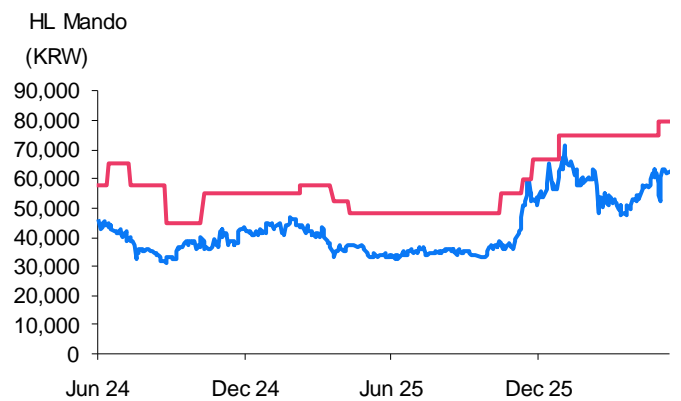
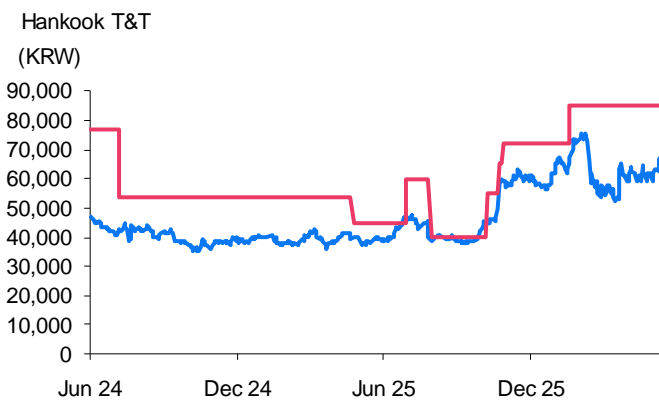
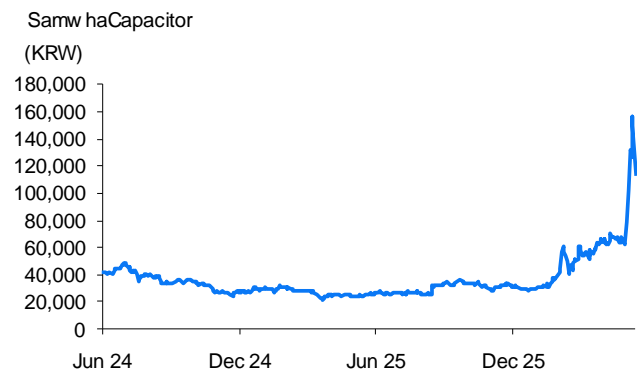
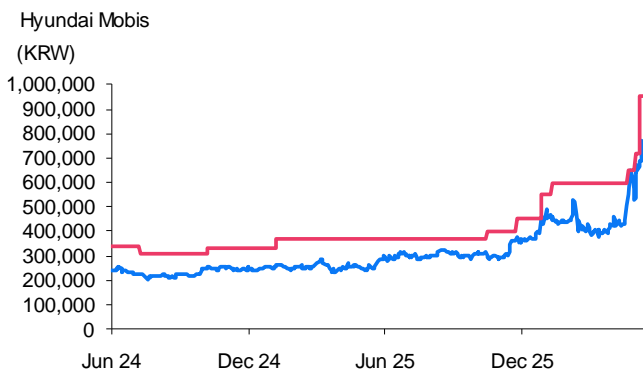
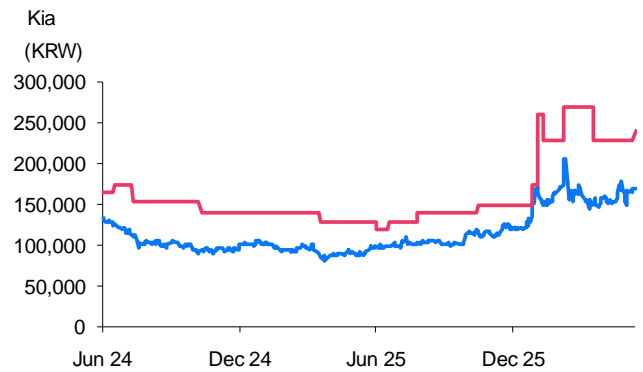
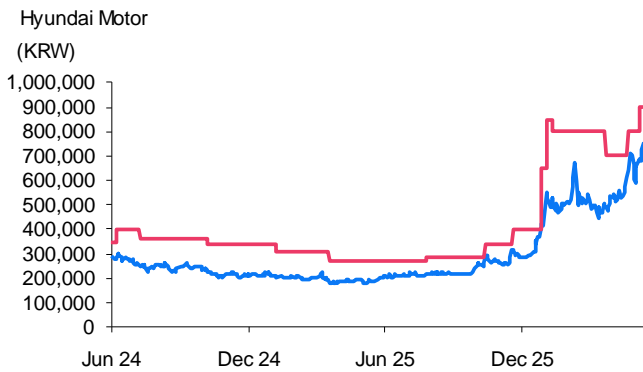
Financial ratios

Year-end Dec 31	2024	2025	2026E	2027E	2028E
Growth (%)					
Sales	2.8	5.4	9.0	9.0	7.0
Operating profit	2.3	3.0	13.2	12.7	7.8
Net profit	9.4	-16.0	25.8	10.9	6.8
Adjusted EPS**	9.8	-15.6	26.4	10.9	6.8
Per-share data (KRW)					
EPS (parent-based)	7,930	6,692	8,459	9,382	10,021
EPS (consolidated)	8,223	6,906	8,690	9,637	10,294
Adjusted EPS**	7,930	6,692	8,459	9,382	10,021
BVPS	49,934	55,423	61,092	67,103	73,460
DPS (common)	1,200	2,770	3,450	3,750	3,750
Valuations (x)					
P/E***	3.8	6.4	9.0	8.1	7.6
P/B***	0.6	0.8	1.2	1.1	1.0
EV/EBITDA	2.6	3.4	5.2	4.5	4.0
Ratios (%)					
ROE	17.4	12.8	14.6	14.8	14.4
ROA	11.0	8.3	9.7	9.9	9.7
ROIC	17.4	15.2	17.2	18.7	19.4
Payout ratio	15.0	41.0	40.4	39.6	37.1
Dividend yield (common)	4.0	6.5	4.6	4.9	4.9
Net debt to equity	-1.0	-6.4	-12.5	-17.9	-23.2
Interest coverage (x)	21.7	29.3	36.3	43.8	47.2

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Target price changes in past two years



Rating changes over past two years (adjusted share prices)

Hyundai Motor												
Date	2024/5/29	6/25	7/26	10/25	2025/1/24	4/7	8/14	10/31	12/8	2026/1/14	1/22	1/30
Recommendation	BUY	BUY	BUY	BUY	BUY	BUY	BUY	BUY	BUY	BUY	BUY	BUY
Target price (KRW)	345000	400000	360000	340000	310000	270000	285000	340000	400000	650000	850000	800000
Gap* (average)	-21.52	-31.63	-32.30	-37.27	-34.90	-26.06	-20.49	-20.69	-22.55	-27.91	-40.91	-35.99
(max or min)**	-16.96	-25.50	-28.06	-33.38	-28.39	-17.41	-7.02	-7.35	1.50	-15.54	-37.88	-15.75
Date	4/7	4/10	5/11	5/27								
Recommendation	BUY	BUY	BUY	BUY								
Target price (KRW)	800000	700000	800000	900000								
Gap* (average)	-37.66	-23.42	-17.04									
(max or min)**	-36.50	-12.43	-26.00									
Kia												
Date	2024/5/29	7/4	7/29	10/28	2025/4/7	6/20	7/7	8/14	11/3	2026/1/14	1/22	1/29
Recommendation	BUY	BUY	BUY	BUY	BUY	BUY	BUY	BUY	BUY	BUY	BUY	BUY
Target price (KRW)	165000	175000	155000	140000	130000	120000	130000	140000	150000	175000	260000	230000
Gap* (average)	-24.20	-31.41	-34.54	-30.66	-30.49	-17.88	-21.50	-24.00	-20.38	-7.53	-40.63	-30.12
(max or min)**	-19.82	-27.83	-27.68	-23.79	-23.38	-15.75	-15.08	-14.36	-9.33	-1.66	-38.85	-24.35
Date	2/25	4/7	6/1									
Recommendation	BUY	BUY	BUY									
Target price (KRW)	270000	230000	240000									
Gap* (average)	-39.27	-30.51										
(max or min)**	-23.70	-21.96										
Hyundai Mobis												
Date	2024/3/20	7/26	10/25	2025/1/24	11/3	12/12	2026/1/14	1/28	5/11	5/20	5/27	
Recommendation	BUY	BUY	BUY	BUY	BUY	BUY	BUY	BUY	BUY	BUY	BUY	
Target price (KRW)	340000	310000	330000	370000	400000	450000	550000	600000	650000	720000	950000	
Gap* (average)	-30.85	-28.56	-24.95	-24.53	-22.07	-16.66	-16.89	-28.76	-8.41	-8.33		
(max or min)**	-21.76	-19.35	-21.67	-12.30	-9.38	0.22	-11.36	-11.83	0.00	-6.94		
SamwhaCapacitor												
Date	2026/6/2											
Recommendation	Not Rated											
Target price (KRW)	n/a											
Gap* (average)												
(max or min)**												

Rating changes over past two years (adjusted share prices)

Hankook T&T										
Date	2024/5/2	7/25	2025/5/12	7/17	8/18	10/27	11/10	11/14	2026/2/5	
Recommendation	BUY	BUY	HOLD	BUY	HOLD	BUY	BUY	BUY	BUY	
Target price (KRW)	77000	54000	45000	60000	40000	55000	65000	72000	85000	
Gap* (average)	-42.64	-26.89	-10.33	-25.13	0.11	-15.80	-8.72	-15.70		
(max or min)**	-31.56	-17.31	3.89	-21.17	13.38	-10.27	-8.15	-6.67		

HL Mando												
Date	2024/4/29	6/3	7/1	7/29	9/11	10/28	2025/2/25	4/7	4/28	11/3	12/1	12/12
Recommendation	BUY	BUY	BUY	BUY	BUY	BUY	BUY	BUY	BUY	BUY	BUY	BUY
Target price (KRW)	41000	58000	65000	58000	45000	55000	58000	52000	48000	55000	60000	67000
Gap* (average)	-3.55	-21.93	-35.91	-39.90	-18.57	-24.91	-29.05	-31.59	-27.26	-29.25	-8.90	-16.17
(max or min)**	5.85	-14.48	-32.15	-32.76	-10.67	-15.18	-23.88	-27.88	-19.69	-15.27	-1.33	-2.39

SL Corporation										
Date	2026/1/14	5/19								
Recommendation	BUY	BUY								
Target price (KRW)	75000	80000								
Gap* (average)	-24.08									
(max or min)**	-4.80									

SL Corporation									
Date	2023/7/6	2024/6/18	7/1	8/16	9/11	2025/5/22	2026/1/14	1/22	5/18
Recommendation	BUY	BUY	BUY	BUY	BUY	BUY	BUY	BUY	BUY
Target price (KRW)	50000	60000	65000	55000	48000	43000	66000	87000	93000
Gap* (average)	-32.97	-27.26	-41.11	-40.00	-32.28	-17.11	-19.92	-29.99	
(max or min)**	-11.60	-24.67	-32.08	-37.09	-17.29	7.79	-1.82	-15.63	

Note: * [(average, maximum, or minimum share price over duration of target price minus target price) / target price] x 100%

** Maximum/minimum share price if new target is higher/lower than market close on the business day prior to target price change

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Industry

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UNDERWEIGHT	Expected to underperform market by 5% or more within 12 months

* Note: Effective Jul 27, 2023, BUY, HOLD, and SELL criteria are based on expectations of share-price moves of 15% or more within 12 months

Percentage of ratings in 12 months prior to 2026.03.31

BUY(85.2%)-HOLD(14.8%)-SELL(0%)

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