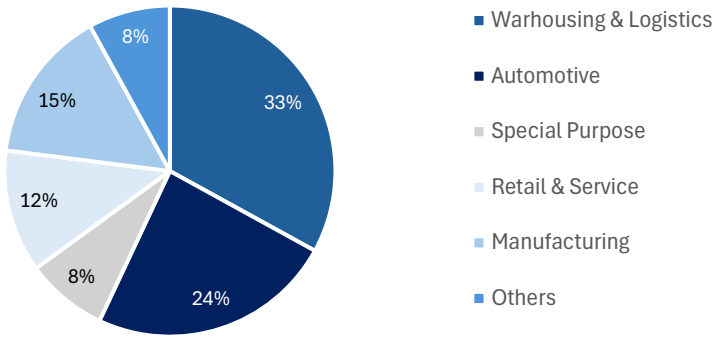
Humanoid Robots- The age of Automation

Market Overview

Humanoid robots are emerging as a new frontier in automation, driven by rapid advances in AI, sensors, and robotics hardware. While technology remains in early stages with most deployments limited to pilot projects by companies such as Tesla, BMW, and BYD, momentum is building as industries seek solutions to labor shortages and productivity challenges. Asia-Pacific is expected to be the fastest-scaling region, supported by its strong manufacturing base, mature robotics ecosystem, and government-led innovation initiatives.

Market share by application



Macroeconomic and Structural drivers

Aging population

By 2050, ~25% of APAC's population will be over 60. Japan's care sector has only 0.24 applicants per job. South Korea became "super-aged" (18% ≥65) in 2025, creating acute demand for care robots and automated service delivery.

Labor shortages across APAC

Japan and Korea rely increasingly on automation to offset low birth rates. China's factories face rising labor costs and lower migration inflows. 70% of new industrial robot installations in 2023 were in Asia signaling structural demand.

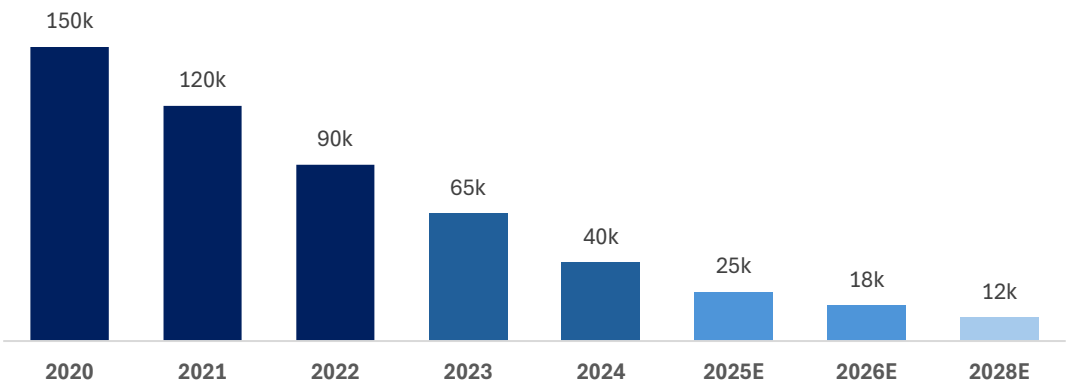
Declining production costs

Advances in AI chips, sensors, actuators, and battery tech are driving rapid cost declines. Mass production from major tech companies is improving manufacturing efficiency and reducing unit economics, making humanoid robots commercially viable.

Accelerating investment flows

VC funding, corporate R&D, and IPO activity surging. Chinese startups (AgiBot, Unitree, UBTech) attracting significant capital. Major investors BYD, Tencent, LG, Mirae Asset increasing exposure. Dedicated robotics ETFs emerging.

Humanoid robot production cost trajectory (Unit production cost in USD)



Source: Barclays, Counterpoint.

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Leading APAC robotics hubs

China

Global leader - 80% + of 2025 humanoid installations. AgiBot, Unitree, UBTech scaling rapidly across logistics, manufacturing, and automotive. Strong government backing and large-scale manufacturing capabilities driving commercialization.

South Korea

Among the world's most advanced industrial robotics markets, now expanding into humanoid development. Hyundai Motor Group and KAIST advancing legged and humanoid tech. Government-led robotics clusters accelerating local manufacturing.

Japan

Pioneer in robotics R&D and industrial automation with decades of expertise. Society 5.0 initiative channels significant funding into AI and robotics. Aging demographics and rising healthcare needs driving demand for service and elder-care robots.

Other APAC

India seeing rapid growth in industrial robot installations. Singapore and Southeast Asia piloting service robots in healthcare, hospitality, and tourism. Taiwan's semiconductor ecosystem playing a critical enabling role in robotics computing and AI hardware.

Stocks to watch in the APAC robotics ecosystem

Company	Country	Status	Why it matters
UBTech Robotics	China	Public	One of the world's few publicly listed humanoid manufacturers. Walker robots piloted at BYD, Foxconn for logistics and assembly tasks.
Robotis	South Korea	Public	Known for humanoid robotics platforms and actuator technology. Widely used in research and robotics development globally.
SoftBank Group	Japan	Public	One of the earliest commercial humanoid robot developers. Exposure via robotics subsidiaries and technology investments.
Hanson Robotics	Hong Kong	Private	One of the most well-known humanoid robotics companies globally. AI-enabled social humanoids for research, education, and service roles.
AgiBot (Zhiyuan)	China	Pre-IPO	One of China's fastest-growing humanoid startups. Focused on general-purpose humanoid systems with strong capital backing.
Fourier Intelligence	China	Pre-IPO	Rapidly emerging humanoid company. GR-1 robots deployed in research, rehabilitation, and industrial pilot programs.
EngineAI Robotics	China	Private	Developing industrial humanoids for manufacturing and logistics. Gaining traction in China's robotics ecosystem.

Investment Opportunities across the value chain

AI chips & compute
- GPU / NPU designers
- Edge AI processors
- Custom ASIC for robotics

Sensors & actuators
- LiDAR & vision systems
- Force / torque sensors
- Precision actuators

Software platforms
- Robot OS & middleware
- AI / ML training stacks
- Simulation & digital twin

OEMs & integrators
- Humanoid manufacturers
- System integrators
- Automation providers

Source: Barclays

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Aranca's View

Humanoid robotics is expected to evolve as a long-term automation theme driven by AI advances and persistent labor shortages. Deployment has already begun in industrial settings such as automotive factories and logistics warehouses, where repetitive tasks justify automation, and is likely to expand into service areas like healthcare and retail as reliability improves.

For fund managers, investment opportunities extend across the broader ecosystem including AI chipmakers, advanced sensors and actuator manufacturers, robotics software platforms, and automation system integrators that enable humanoid capabilities. A new generation of pure-play humanoid OEMs is scaling rapidly, with several private companies positioning for potential public listings in the coming years.

Humanoid robotics is shaping up as the next AI-driven automation wave, where investors may increasingly focus on the underlying "brain and body" of the ecosystem: OEMs, AI chips, sensors, and software platforms.

Key Risks to consider

- Key risks include technology/performance risk (robots often under-deliver vs. hype in early trials) and adoption risk (high costs and complexity may slow uptake).
- Geopolitical factors (export controls on AI chips, US-China tech tensions) could limit supply chains.
- Monitoring developments in regulation (AI safety laws) and competitive shifts (new entrants, M&A) is essential.

Key takeaways for portfolio managers

Structural theme, not cyclical

Humanoid robotics is driven by irreversible demographic shifts (aging, labor shortages) and compounding AI capabilities. This is a multi-decade automation wave. Position for long-term thematic exposure.

Expanding Investible Universe

Watch for pre-IPO names (AgiBot, Fourier Intelligence) entering public markets as commercialization advances. The listed universe is currently narrow but expected to grow materially over2026–2028.

Ecosystem over end-product

The highest-conviction near-term opportunities may lie in the enabling stack AI chips, sensors, actuators, and software rather than OEMs alone. These companies benefit regardless of which platform wins.

APAC as the alpha geography

With 80%+ of current deployments, the strongest policy support, and the deepest manufacturing ecosystems, APAC especially China, Japan, and South Korea is where the thesis is playing out first.

2500+
Global Clients

500+
Strong professional team across multi-disciplinary domains

120+
Sectors and sub-sectors researched by our analysis

80+
Countries where we have delivered projects

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