

## AUTOS &amp; INDUSTRIAL TECH

## Platforms & Power - Part II: Humanoids and profit implications for autos & industrial tech

**There is the potential over time for humanoid robots to drive incremental profitability for autos and industrial tech companies, both as a new product to sell and as a contributor of lower costs.** This is particularly relevant for Tesla, which is developing the Optimus robot for both internal use and to sell to external customers. Tesla's CEO suggested in September 2025 on X that humanoids could account for 80% of the future value of the company. Humanoids could also affect our coverage more broadly including EMS (both using and helping to manufacture robots) and autos (for labor savings). **In this report, we discuss implications for Tesla, Jabil, and Flex and also highlight several key North American based humanoid companies including Agility, Apptronik, Boston Dynamics, Figure AI, Sanctuary, and 1X.**

**Humanoids are already very impressive in several regards in our opinion,** including the speed at which the technology is improving with the help of AI. **However, there are still challenges to address before scaled deployments occur** per our industry discussions that relate to hardware (including with touch/precision in the hands, speed of work, battery life), software/reasoning (and gathering the data needed to train the AI for robotics), and putting this into an effective full solution that is safe around humans. The industry is focused on these challenges, including by looking to curate the right data to train the robots. Tesla, Boston Dynamics (with Hyundai), Apptronik (with Jabil, GXO, and Mercedes), Agility (with GXO and Amazon) and Figure AI (with BMW and Brookfield) are examples of companies seeking to gather this data and improve humanoid technology. There are also new tools like Nvidia's GR00T foundation model, and proprietary AI models from robotics companies, that aim to use end to end AI techniques with reinforcement learning to solve the software related challenges. **Given where the technology currently stands, our industry discussions suggest that it will be at least a few years before humanoids begin to scale in controlled settings, such as a factory.** We discuss some recent AI studies on these dynamics in this report.

**As previously articulated in the report Global Automation: Humanoid Robots: The AI accelerant led by Jacqueline Du, the humanoid robot market could grow from about 20K units in 2025 to ~1.4 mn units with ~\$38 bn of revenue in 2035.** We believe that if the technology allows, humanoids would be ideal for certain use cases involving varied workloads (relative to more fixed repetitive tasks that are well

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suited for purpose built industrial automation). In the longer-term, especially in upside scenarios, humanoids could also address a wider range of applications including elderly care and home chores. The GS ‘Blue Sky’ scenario is ~\$205 bn (if humanoids become more commonly adopted consumer products and have a wider industrial role), and Tesla’s CEO suggested on its 4Q24 earnings call that Optimus could generate over \$10 trillion of revenue long-term. However, more cautious industry observers point to challenges with sensing/inputs (e.g. force and touch) that limit precision, reasoning challenges in complex settings, and safety (including the risk of bipedal humanoid robots falling over if they lose power). Potential industrial customers of humanoids also need to evaluate trade-offs on which type of robot is ideal (e.g. fixed or general purpose). We think it’s instructive to frame the current global market for industrial robots, which is ~550K per year per IFR data. This suggests the GS 1.4 mn forecast for humanoids as a base case in 2035 would be driven by adoption both in industrial and consumer/commercial settings. **Ultimately, just like with AVs, we believe the market will eventually develop, and at this earlier stage it's a question of the timing/growth rate/size of the market and how the robots evolve in terms of form factor and function.** We also believe humanoids could have some of the ‘long-tail’ challenges to work through, similar to what occurred with AVs.

**We believe that humanoid robots are another market that can be examined with respect to the domains of both platforms and power that we think are key for determining success in the auto & industrial tech industry.** For humanoids, power efficiency is important for battery life (e.g. working hours between charging) just like it is for EVs, and power management will be key to fuel the datacenters needed to train the AI. Finally, just like cars, in the long-term, humanoids could be a platform for high-margin software & services (perhaps specific tasks would require different subscriptions).

**For Tesla,** the company could potentially benefit from both using its Optimus robot for internal operations, and by selling it externally. We believe Tesla can leverage some of its expertise from vehicles/energy including for power electronics/semis, navigation related AI software, and manufacturing. We think this has the potential to lead to a cost advantage for Tesla that may reach several thousand dollars per robot. Tesla also has the factory environment that can be used to gather training data. We estimate humanoids could add \$0.10-\$3.00 in 2030 to Tesla’s EPS, assuming it ships 50K-1.5 mn humanoid robots at a ~\$40-60K ASP and 10-15% EBIT margin, generates high-margin subscription revenue at \$50-\$100 per month on the installed base, and can save 10-50% for 1-10% of its labor. In 2035, if new shipments reach 100K-5 mn at a 10-20% EBIT margin, along with a services contribution and labor savings, the EPS impact could be \$0.20-\$13.00. We acknowledge scenarios exist beyond these ranges.

**For Jabil,** the company can benefit in our view from its ability to help in manufacturing humanoids for customers, use humanoids for labor savings, and help provide the data needed to train the AI. Jabil has a partnership with Apptronik, and we believe its past strong business relationships with Amazon and Tesla puts it in a position to potentially participate in robotics/humanoids at these companies over time (although we don’t think Jabil is currently supporting humanoids at Tesla or Amazon). We believe Jabil has expertise in key technologies to enable humanoids including manufacturing, material sciences/anodizing, mechanicals, compute, and power electronics. By 2030, if Jabil generated \$250-\$50,000 of revenue per humanoid (with the lower end assuming

parts/materials and the high-end full manufacturing) on 1-10% of global humanoid robots, and assuming humanoids can save 10-50% on 1-15% of its direct labor (with Jabil dropping half of this to the bottom line), then we estimate this could equate to as much as \$1 of EPS. In 2035, the EPS impact could be up to ~\$4 under similar assumptions (applied to a larger market). At the lower end of these assumptions, the EPS impact would be minimal.

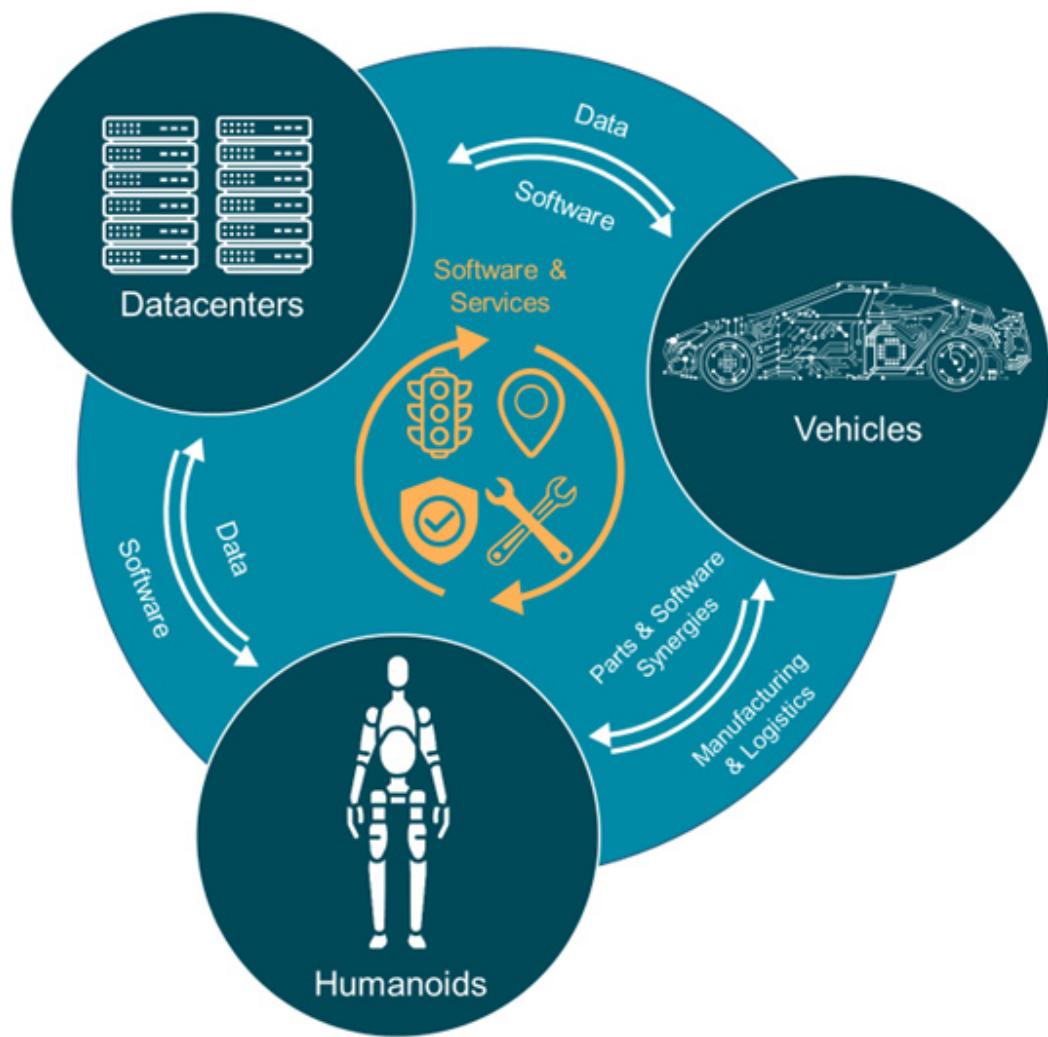
**For Flex**, we believe its history in automation and manufacturing, as well as capabilities in areas including material sciences, power, compute, and actuators should allow it to be a contributor to the market. By CY30, if Flex generated \$250-\$50,000 of revenue per humanoid on 1-10% of global humanoid robot shipments, and assuming humanoids can save 10-50% on 1-15% of its direct labor (with half of this dropping to the bottom line), then this could equate to as much as ~\$0.25 of EPS. In CY35, we estimate that the EPS impact could be up to about \$1. At the lower end of these assumptions, the EPS impact would be minimal.

**We believe the best way to invest in this opportunity currently in our US coverage is in the industrial tech ecosystem, with several companies in our coverage already providing the products that underpin EV and AV platforms and power datacenters.** We expect these core technologies to often be key for humanoids too. These include the connectors and electronic/electrical components used to power datacenters, and the high-speed/low-latency connectors and cables required for racks and servers to train AI. These products are provided by companies such as **TEL** and **APH**. We also believe companies in the EMS sector can leverage their capabilities in manufacturing, automation, supply chain, material sciences, compute, actuation, and power electronics to support humanoids, such as **JBL** and **FLEX**.

**There are several companies in the supply chain in Asia with exposure to this market**, such as Sanhua, Harmonic Drive, Leaderdrive, Hon Hai, Quanta, Luxshare, Lingyi, Hikvision, Huaqin, iFlytek, and Sensetime (please see the report "[Humanoid Robots III: The supply chain dynamism](#)" for more details).

## Humanoid Robots - another market where platforms and power are key; detailing technology progress

**We believe that humanoid robots are another market that can be examined with respect to the domains of both platforms and power that we think are key for determining success in the auto & industrial tech industry.** For humanoids, power efficiency is important for battery life (e.g. working hours between charges) just like it is for EVs, and power management will be key to fuel the datacenters needed to train the AI. Finally, just like cars, in the long-term, humanoids can be a platform for high-margin software & services (perhaps specific tasks would require different subscriptions). There is also the potential for humanoid robots to play a role in manufacturing and logistics within an automotive or industrial factory, especially for tasks with too much variability to cost-effectively automate with traditional robotics.



Source: Goldman Sachs Global Investment Research

Humanoid robotics can leverage many of the same technologies and parts as EVs and AVs, including object detection and path planning algorithms, inference compute, sensing, and power management. However, specialized hardware is needed especially with respect to actuators and mechanical parts. Tesla's CEO stated at its 2023 investor day that most of these parts are not available off the shelf, and Tesla's engineers are developing many of these products in-house. Our industry discussions suggest several humanoid robotics companies are devoting R&D to actuator and mechanical development, and developing more accurate touch and texture recognition in the hands. Many of the companies in the supply chain providing actuators, reduction gear, motors, and sensors are located in Asia, as detailed extensively by Jacqueline Du, Yuichiro Isayama and team in their reports [Humanoid Robot: The AI accelerant](#) and [Humanoid Robot III: The supply chain dynamism](#).

While we think companies are still focused on hardware improvements (both with respect to cost and capability), we believe more of the remaining work needed is on software development to allow the humanoid robots to handle varied tasks beyond a controlled setting, and on full solutions that can safely be deployed near humans. While AI can allow for much faster iterations than historical task-specific programming, proper data is needed for this training. The industry is focused on these challenges, including by looking to curate the right data for training. Tesla, Boston Dynamics (with Hyundai),

Apptronik (with Jabil, GXO and Mercedes), Agility (with GXO and Amazon) and Figure AI (with BMW and Brookfield) are examples of companies seeking to gather this data (in part synthetically) and improve humanoid technology. There are also new tools like Nvidia's GROOT foundation model, and proprietary AI models from robotics companies, that aim to use end to end AI techniques with reinforcement learning to solve the software related challenges.

#### **Foundation models for physical AI and robotics**

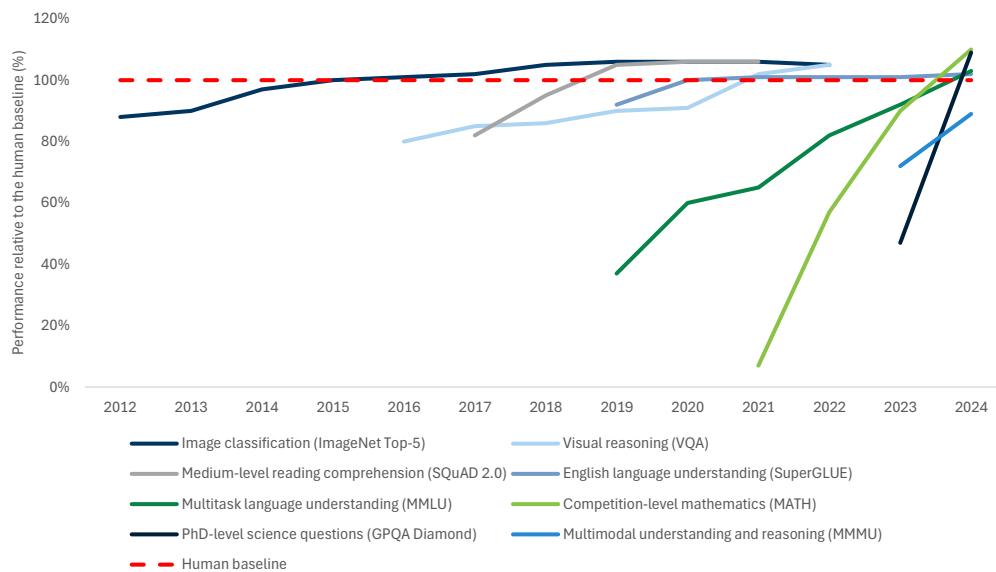
**Recall that physical AI, per Nvidia, is what enables autonomous machines such as robots and AVs to perceive, understand, and perform complex actions in the physical world. Moreover, different from generative AI models (e.g. ChatGPT and Llama) which are trained on mostly text and images procured from the internet, physical AI needs to understand the spatial and physical rules of the real world.**

Given the parameters required for humanoid robots to understand the physical world in which they operate, Vision-Language-Model (VLM) and Vision-Language-Action models (VLA) have increasingly become topical. Per Nvidia, VLMs are an integration of LLMs with a vision encoder (vision model) that simultaneously process and understands visual and textual inputs and allows VLMs to perform tasks such as to analyze images and summarize videos. VLMs then become the base for VLAs or a model/AI system that processes images/videos and understands human language and translates this into meaningful action.

For example, at Nvidia's 2025 GTC conference, the company launched its open sourced VLA model Isaac GROOT N1 model. Per Nvidia, its VLA is powered by two systems that are inspired by the human cognition principles of thinking fast and slow. The "slow thinking" model, which is powered by a VLM, lets the robot perceive and reason about its environment and instructions, and then plan the correct action to take. The "fast thinking" model then puts the plan into action. The AI can be trained on a combination of human demonstration data, synthetic data, and real world examples. Companies can use reinforcement learning to improve robot performance. Another example of a VLA model is Figure AI's Helix.

The performance of AI models has developed rapidly, as detailed by the Stanford HAI lab in their 2025 AI index report, with AI models now able to match or eclipse world-class mathematicians, solve PhD level science problems, and pass the CFA exam. As shown in the HAI report, the models are progressing rapidly, even from the year prior.

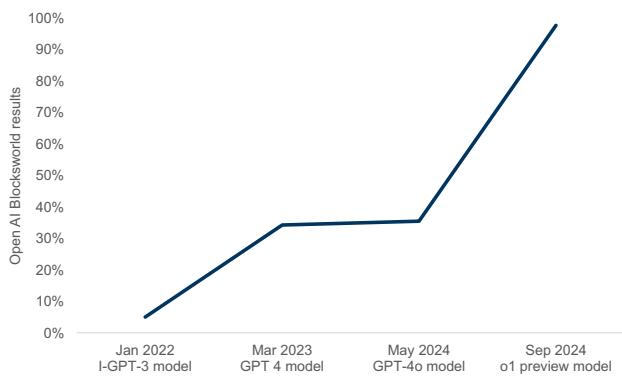
### Exhibit 1: Select AI Index technical performance benchmarks vs. human performance



Source: Stanford University Institute for Human-Centered AI, Goldman Sachs Global Investment Research

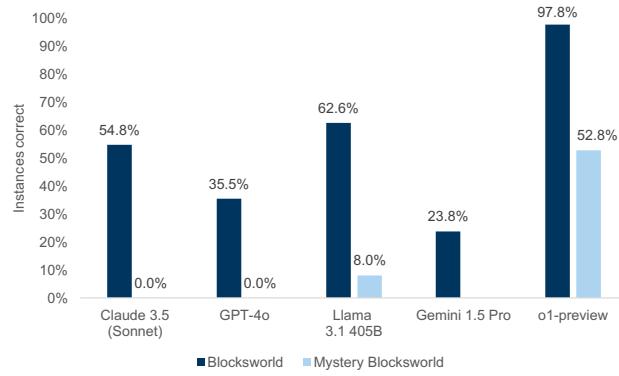
However, AI models can still have some difficulty with reasoning in complex environments. This has been shown with the PlanBench benchmark, with AI model performance improving but still having some challenges with more difficult versions of the challenge where certain instructions need to be inferred by the AI model. For context, the PlanBench Blocksworld test is specialized to benchmark the planning and reasoning capabilities of AI models. The Blocksworld problem involves a set of blocks on a table that need to be rearranged into a target configuration with certain rules and constraints around where blocks can be placed. The Mystery Blocksworld test includes problems where the answers can be difficult to understand.

### Exhibit 2: PlanBench: instances correct on Blocksworld



Source: Stanford University Institute for Human-Centered AI, Goldman Sachs Global Investment Research

### Exhibit 3: PlanBench: instances correct on Blocksworld and Mystery Blocksworld test



Source: Stanford University Institute for Human-Centered AI, Goldman Sachs Global Investment Research

The complex real world reasoning dynamic reminds us of AV development (especially given the overlap with humanoid and AV technology). As detailed in [our June 2025 report](#), “AVs: Framing profit pools in rideshare, trucking, and insurance as AVs move from concept to commercialization”, AV technology has arrived, and we think the debate is

now about how fast the market will scale and the ultimate share of the market AVs will take. At the same time, all of the AV companies in the world, to our knowledge, (e.g. Waymo, Baidu, Pony Ai, Aurora, etc) are using human remote assistance and monitoring to varying degrees, which is one reason why AVs are still only available as a commercial product (i.e. robotaxis and robotrucks). We do expect AVs to eventually be available to consumers, potentially with a subscription for remote assistance and human remote monitoring still needed. Importantly, AVs as currently deployed (with remote monitoring and assistance) are on the order of 90% safer than human drivers per Waymo's safety data. While some may argue that AVs have a unique need for human oversight (e.g. a mistake could lead to a car accident and be fatal), robots can also carry risks when interacting with humans (e.g. falling on or colliding with humans).

### Cost to develop the technology

Tesla suggested in 2024 that its AI related spend overall (encompassing R&D and capex) was about \$10 bn, with \$3-\$4 bn on GPUs. While other humanoid companies in North America are private and/or part of conglomerates, we'd estimate that typical investment levels at these companies range from the tens of millions to low hundreds of millions of dollars per year (based on employee headcount disclosures, typical engineering salaries, and consistent with data from AV start-ups that are developing similar technology).

For capex needs specifically, humanoid companies are planning to utilize both partnerships and internal manufacturing (with Agility currently having space to manufacture up to 10K robots per year at its Robofab, and Figure AI up to 12K robots per year at its BotQ facility).

## Framing the market for robotics

**As previously articulated in the report Global Automation: Humanoid Robots: The AI accelerant led by Jacqueline Du, the humanoid robot market could grow from about 20K units in 2025 to ~1.4 mn units with ~\$38 bn of revenue in 2035.** We believe that if the technology allows, humanoids would be ideal for certain use cases involving varied workloads (relative to more fixed repetitive tasks that are well suited for purpose built industrial automation).

### Exhibit 4: Global humanoid robot unit shipments

Global shipment ('000)	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E	2032E	2033E	2034E	2035E
Base	1	4	20	51	76	114	171	256	359	502	703	985	1,378
yoY		250%	471%	153%	50%	50%	50%	40%	40%	40%	40%	40%	40%
Bear	1	1	1	4	20	51	76	114	171	256	359	502	703
yoY		0%	0%	250%	471%	153%	50%	50%	50%	50%	40%	40%	40%
Bull	1	7	30	75	148	299	594	890	1,323	1,966	2,924	4,351	6,478
yoY		575%	344%	150%	97%	102%	99%	50%	49%	49%	49%	49%	49%
Blue-sky	1	10	40	100	220	484	1,016	1,525	2,287	3,430	5,146	7,718	11,577
yoY		900%	300%	150%	120%	120%	110%	50%	50%	50%	50%	50%	50%

Source: Goldman Sachs Global Investment Research

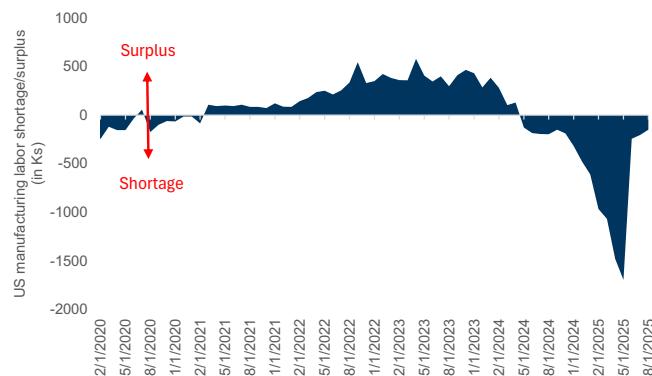
**Exhibit 5: Global humanoid robot TAM**

Global TAM (\$mn)	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E	2032E	2033E	2034E	2035E
Base	64	329	1,538	3,775	5,377	7,032	9,222	12,306	15,354	19,193	24,034	30,153	37,899
yoY		418%	367%	145%	42%	31%	31%	25%	25%	25%	25%	25%	26%
Bear	64	144	730	1,578	2,267	3,990	5,863	7,896	10,250	13,324	16,804	21,230	26,865
yoY		127%	406%	116%	44%	76%	47%	35%	30%	30%	26%	26%	27%
Bull	64	501	1,942	4,890	8,881	14,700	24,180	31,947	41,534	54,114	70,655	92,454	121,247
yoY	-	689%	288%	152%	82%	66%	64%	32%	30%	30%	31%	31%	31%
Blue-sky	64	673	2,347	6,034	12,385	22,369	39,139	51,587	67,715	89,035	117,275	154,754	204,595
yoY		959%	249%	157%	105%	81%	75%	32%	31%	31%	32%	32%	32%

Source: Goldman Sachs Global Investment Research

In the longer-term, especially in upside scenarios, humanoids could also address a wider range of applications including elderly care and home chores. The GS ‘Blue Sky’ scenario is \$205 bn (if humanoids become more commonly adopted consumer products and have a wider industrial role), and Tesla’s CEO has suggested that revenue from Optimus could reach \$10 trillion.

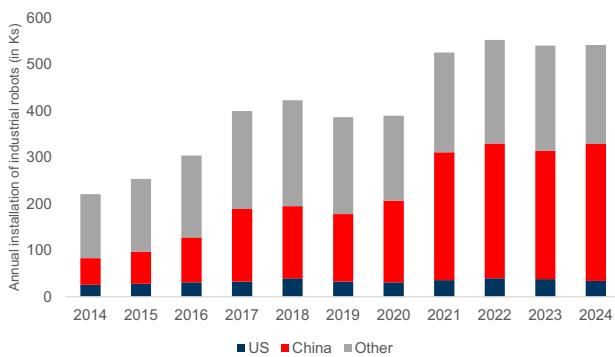
The market is potentially very large. There are ~13 mn people employed in manufacturing roles in the United States, ~8-10 mn in Mexico and 70-80 mn in China per data from the ILO, US Bureau of Labor (BLS) and our industry discussions. Moreover, BLS statistics suggest there is currently a shortage of manufacturing workers in the US ([Exhibit 6](#)). The US also employs 3 million people in Agricultural roles and 7 million in logistics related to package and materials handling per the BLS. [Per Agility Robotics](#), there are over 1 mn unfilled roles for materials handling in the US. [Per an interview with Apptronik’s CEO](#), the shortage of nurses could reach roughly 10 mn in 2030.

**Exhibit 6: US manufacturing labor shortage/surplus (in Ks)**

Defined as job openings minus number of people unemployed

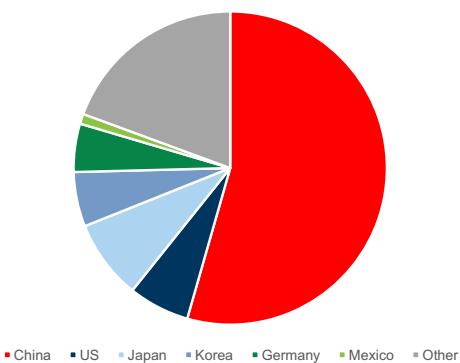
Source: US Bureau of Labor Statistics

While humanoids are one option for automation, companies can also consider fixed purpose robotics (as detailed by [Bloomberg](#)). We therefore think it's instructive to frame the current global market for industrial robots, which are ~550K per year per the International Federation of Robotics (IFR; [Exhibit 7](#)). The installed base is about 4.7 mn per the IFR ([Exhibit 8](#)).

**Exhibit 7: Annual installations of industrial robots (in Ks)**

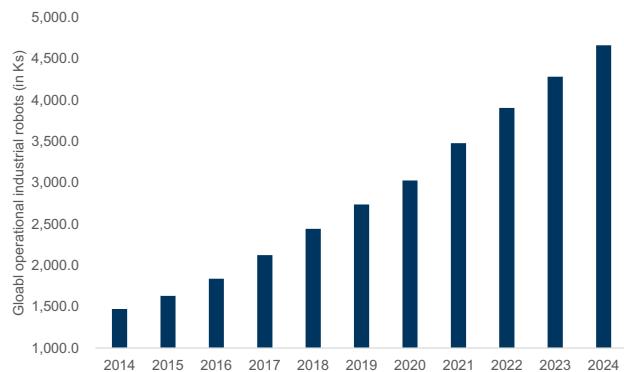
Source: IFR

Over half of the deployments in 2024 were in China, with Japan, Korea, Germany the US and Mexico also key regions for robots ([Exhibit 9](#)). The Automotive and Electronics markets are the key applications for these deployments ([Exhibit 10](#)).

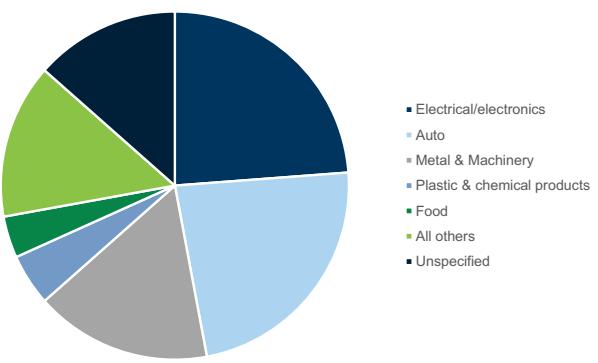
**Exhibit 9: 2024 installations of new industrial bots by geography**

Source: IFR

While manufacturing wages in the US are ~4-6X higher per hour than in China per our industry discussions, robot density is actually higher in China than in the US ([Exhibit 11](#)). This implies in our opinion that technical feasibility of automation may be a bigger driver of deployments rather than just labor rates.

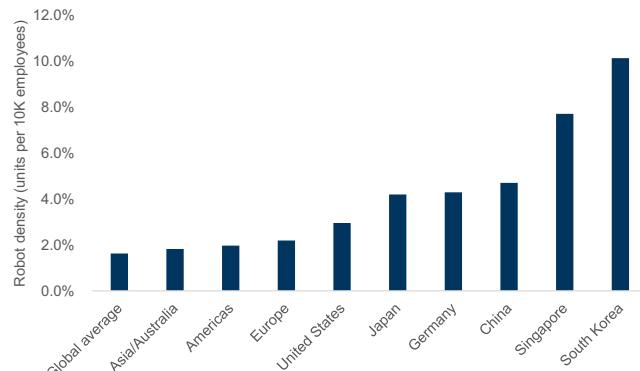
**Exhibit 8: Global operational industrial robots (in Ks)**

Source: IFR

**Exhibit 10: 2024 installations of new industrial bots by industry**

Source: IFR

### Exhibit 11: Robot density (units per 10K employees)



Source: IFR

The ~550K market size for industrial robots suggests the GS 1.4 mn forecast for humanoids as a base case in 2035 would be driven by adoption both in industrial and consumer/commercial settings.

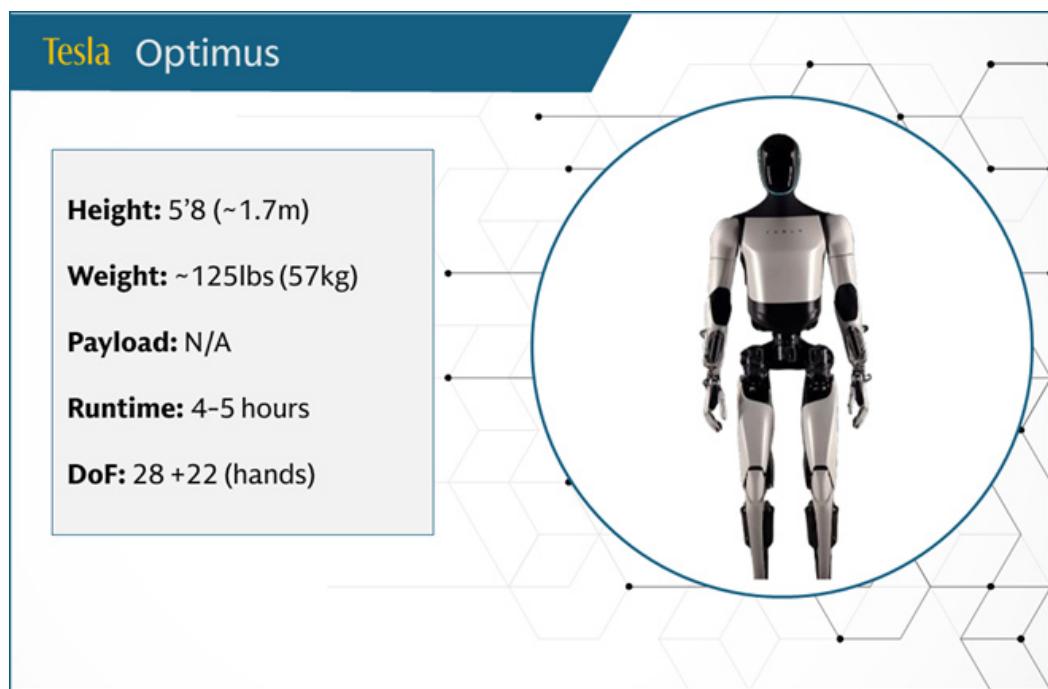
**Given where the technology currently stands, our industry discussions suggest that it will be at least a few years before humanoids begin to scale in controlled settings such as a factory, and some industry participants and users of robotics that we have spoken with have suggested it may be five or more years before they are using humanoids. However, just like with AVs, we believe the market will eventually develop and at this earlier stage it's a question of the timing/growth rate/size of the market and how the robots evolve in terms of form factor and function.**

## Spotlight on Tesla

Tesla's CEO suggested in September 2025 on X that humanoids could account for 80% of the future value of Tesla, and the company stated on its 2Q25 earnings call that it targets to make 1 mn humanoid robots per year in 2030. In fact, one of the operational milestones in the 2025 CEO compensation proposal is 1 mn cumulative robots delivered. Tesla aims to scale its Optimus humanoid robot starting in 2026.

While Tesla has not unveiled the full specs of Optimus 3, based on a combination of media reports, company comments and our industry discussions we show potential features in the graphic below. Tesla did show an improved hand with 22 degrees of freedom at its "We, Robot" event in October 2024, up from 11 in the first generation, and we believe this could be used for Optimus 3.

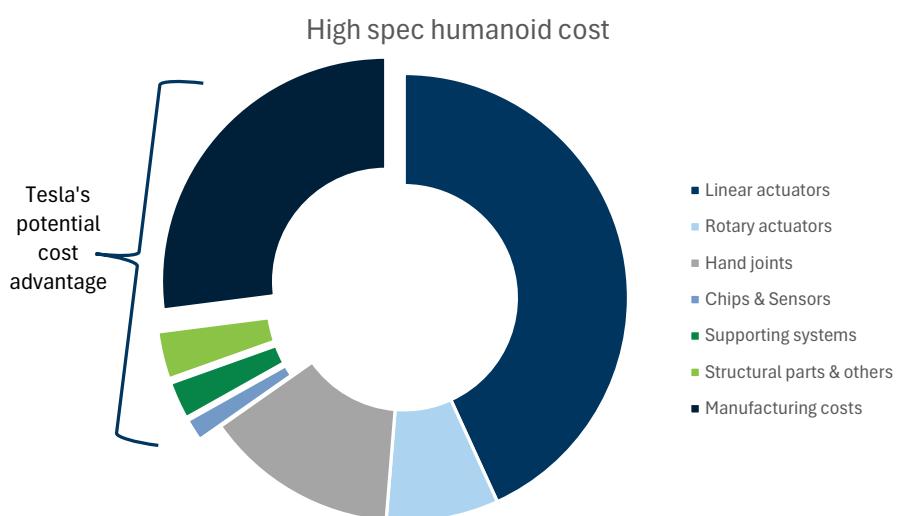
### Optimus - estimates of key features and specs



Source: Company data, Goldman Sachs Global Investment Research

We believe that Tesla is well positioned to address the humanoid market utilizing its experience in hardware (e.g. the silicon and compute), software (e.g. AI training, and an ability to train the robots in a factory), its ability to design power efficient full solutions, and its background in high-volume manufacturing. While Tesla has commented that it needs to design new actuators for Optimus, other aspects of the cost structure are in areas that we believe the company may have a cost advantage (e.g. sensors, compute, and manufacturing) due to the overlap with its other businesses.

### Exhibit 12: Illustrative BoM cost for high spec humanoids



Source: Goldman Sachs Global Investment Research

**For Tesla,** the company could potentially benefit from both using its Optimus robot for

internal operations, and by selling it externally. We believe Tesla can leverage some of its expertise from vehicles/energy including for power electronics/semis, navigation related software, and manufacturing. Overall we believe this could equate to a potential cost advantage that may reach several thousand dollars per robot. Tesla also has the factory environment that can be used to gather training data. We estimate that humanoids could add \$0.10-\$3.00 in 2030 to Tesla's EPS, assuming it ships 50K-1.5 mn humanoid robots at a ~\$40-60K ASP and 10-15% EBIT margin, generates high-margin subscription revenue at \$50-\$100 per month on the installed base, and can save 10-50% for 1-10% of its labor. Tesla has previously commented that it expects to ship 1 mn units in 2030 and expects the BoM to be \$20-30K at scale. In 2035, if new shipments reach 100K-5 mn at a 10-20% EBIT margin, along with a services contribution and labor savings, the EPS impact could be \$0.20-\$13.00. We acknowledge scenarios exist beyond these ranges. We show the ranges of EPS from the sale of robots in Exhibit 13.

**Exhibit 13: Tesla EPS scenarios from upfront humanoid shipments to external customers**

ASP	Units Shipped (Ks)	Tesla upfront humanoid shipments to external customers				
		5%	10%	15%	20%	25%
30	50	\$0.02	\$0.03	\$0.05	\$0.07	\$0.08
	100	\$0.03	\$0.07	\$0.10	\$0.13	\$0.17
	250	\$0.08	\$0.17	\$0.25	\$0.34	\$0.42
	500	\$0.17	\$0.34	\$0.50	\$0.67	\$0.84
	1,000	\$0.34	\$0.67	\$1.00	\$1.34	\$1.67
	1,500	\$0.50	\$1.00	\$1.51	\$2.01	\$2.51
	2,000	\$0.67	\$1.34	\$2.01	\$2.67	\$3.34
	2,500	\$0.84	\$1.67	\$2.51	\$3.34	\$4.18
	3,000	\$1.00	\$2.01	\$3.01	\$4.01	\$5.01
	5,000	\$1.67	\$3.34	\$5.01	\$6.69	\$8.36
40	50	\$0.02	\$0.05	\$0.07	\$0.09	\$0.11
	100	\$0.05	\$0.09	\$0.13	\$0.18	\$0.22
	250	\$0.11	\$0.22	\$0.34	\$0.45	\$0.56
	500	\$0.22	\$0.45	\$0.67	\$0.89	\$1.12
	1,000	\$0.45	\$0.89	\$1.34	\$1.78	\$2.23
	1,500	\$0.67	\$1.34	\$2.01	\$2.67	\$3.34
	2,000	\$0.89	\$1.78	\$2.67	\$3.57	\$4.46
	2,500	\$1.12	\$2.23	\$3.34	\$4.46	\$5.57
	3,000	\$1.34	\$2.67	\$4.01	\$5.35	\$6.69
	5,000	\$2.23	\$4.46	\$6.69	\$8.91	\$11.14
50	50	\$0.03	\$0.06	\$0.08	\$0.11	\$0.14
	100	\$0.06	\$0.11	\$0.17	\$0.22	\$0.28
	250	\$0.14	\$0.28	\$0.42	\$0.56	\$0.70
	500	\$0.28	\$0.56	\$0.84	\$1.12	\$1.39
	1,000	\$0.56	\$1.12	\$1.67	\$2.23	\$2.79
	1,500	\$0.84	\$1.67	\$2.51	\$3.34	\$4.18
	2,000	\$1.12	\$2.23	\$3.34	\$4.46	\$5.57
	2,500	\$1.39	\$2.79	\$4.18	\$5.57	\$6.96
60	50	\$0.03	\$0.07	\$0.10	\$0.13	\$0.17
	100	\$0.07	\$0.13	\$0.20	\$0.27	\$0.34
	250	\$0.17	\$0.34	\$0.50	\$0.67	\$0.84
	500	\$0.34	\$0.67	\$1.00	\$1.34	\$1.67
	1,000	\$0.67	\$1.34	\$2.01	\$2.67	\$3.34
	1,500	\$1.00	\$2.01	\$3.01	\$4.01	\$5.01
	2,000	\$1.34	\$2.67	\$4.01	\$5.35	\$6.69
70	25	\$0.02	\$0.04	\$0.06	\$0.08	\$0.10
	50	\$0.04	\$0.08	\$0.12	\$0.16	\$0.20
	100	\$0.08	\$0.16	\$0.24	\$0.31	\$0.39
	250	\$0.20	\$0.39	\$0.59	\$0.78	\$0.98
	500	\$0.39	\$0.78	\$1.17	\$1.56	\$1.95
	1,000	\$0.78	\$1.56	\$2.34	\$3.12	\$3.90
	1,500	\$1.17	\$2.34	\$3.51	\$4.68	\$5.85
100	25	\$0.03	\$0.06	\$0.08	\$0.11	\$0.14
	50	\$0.06	\$0.11	\$0.17	\$0.22	\$0.28
	100	\$0.11	\$0.22	\$0.34	\$0.45	\$0.56
	250	\$0.28	\$0.56	\$0.84	\$1.12	\$1.39
	500	\$0.56	\$1.12	\$1.67	\$2.23	\$2.79

Source: Goldman Sachs Global Investment Research

Note that for illustrative purposes we show some upside cases in this analysis that are higher than what we used for humanoids in [our recent note](#) looking at 2030 EPS scenarios. Importantly, we still think our \$7-\$9 median case EPS scenario for 2030 for Tesla's total earnings is reasonable.

We believe the key factor for success for Tesla in humanoids will be whether it can meaningfully scale volumes due in large part to its efforts with AI and software, which is similar to our view for AVs. We believe progress with software and AI will be more important to achieving this than hardware cost reductions.

## Spotlight on EMS companies in our coverage

We believe that the EMS companies in our coverage are in a unique position to help with manufacturing (parts and potentially full robots), training (e.g. gathering data in a factory setting), and utilizing the humanoid robots in their factories. Jabil and Flex bring decades of experience in capabilities that include manufacturing, automation, supply chain, material sciences, compute, and power electronics.

We believe this is highlighted by [Jabil's press release on 2/25](#) announcing a collaboration with Apptronik to help with training and manufacturing, including giving the robots access to real world data and validation. Jobs used for testing and validation could include sorting, kitting, object placement, sub-assembly, and delivery per the release.

**For Jabil**, by CY30, if the company generated \$250-\$50,000 of revenue per humanoid (with the lower end assuming parts/materials and the high-end full manufacturing) on 1-10% of global humanoid robots, and assuming humanoids can save 10-50% on 1-15% of its direct labor (with Jabil dropping half of this to the bottom line), then this could equate to up to ~\$1 of EPS. In 2035, we estimate the impact could be up to ~\$4 per share using similar assumptions as 2030 but applied to our 2035 estimate for humanoid shipments of 1.4 mn units. At the lower end of these assumptions, the EPS impact would be minimal. We don't expect humanoids to be a significant driver of Jabil's business for at least a few years, which is consistent with company comments at investor events. However, we think Jabil can benefit in the near to medium term with sales into the datacenter, AV and EV markets that use many of the same technologies as humanoids. Jabil has described AI related businesses as accounting for about 30% of its FY25 revenue, and automotive (mostly for EVs) was an additional low double digit percentage of revenue. Longer-term, Jabil's exposure to companies that could be at the center of this market (e.g. Apptronik, Tesla and Amazon) could position it to be a long-term winner (although we don't believe Jabil's business with Amazon or Tesla is currently tied to humanoid robotics).

**For Flex**, by CY30, if the company generated \$250-\$50,000 of revenue per humanoid on 1-10% of global humanoid robot shipments, and assuming humanoids can save 10-50% on 1-15% of its direct labor (with half of this dropping to the bottom line), then this could equate to up to ~\$0.25 of EPS. In CY35, we estimate the impact could be up to ~\$1 using similar assumptions as 2030 but applied to our 2035 estimate for humanoid shipments of 1.4 mn units. At the lower end of these assumptions, the EPS impact would be minimal. Flex has suggested at recent investor events that it does not expect humanoids to be a meaningful contributor to its operations for at least a few years, but it will continue to monitor the technology and automation/efficiency/AI are key areas of focus within its operations. Flex's business tied to datacenters accounted for about 19% of its FY25 revenue and a larger share of its profit, with this business growing quickly driven by AI and power applications. In addition, automotive accounted for a low to mid teens percentage of revenue (although Flex has less EV specific exposure than Jabil).

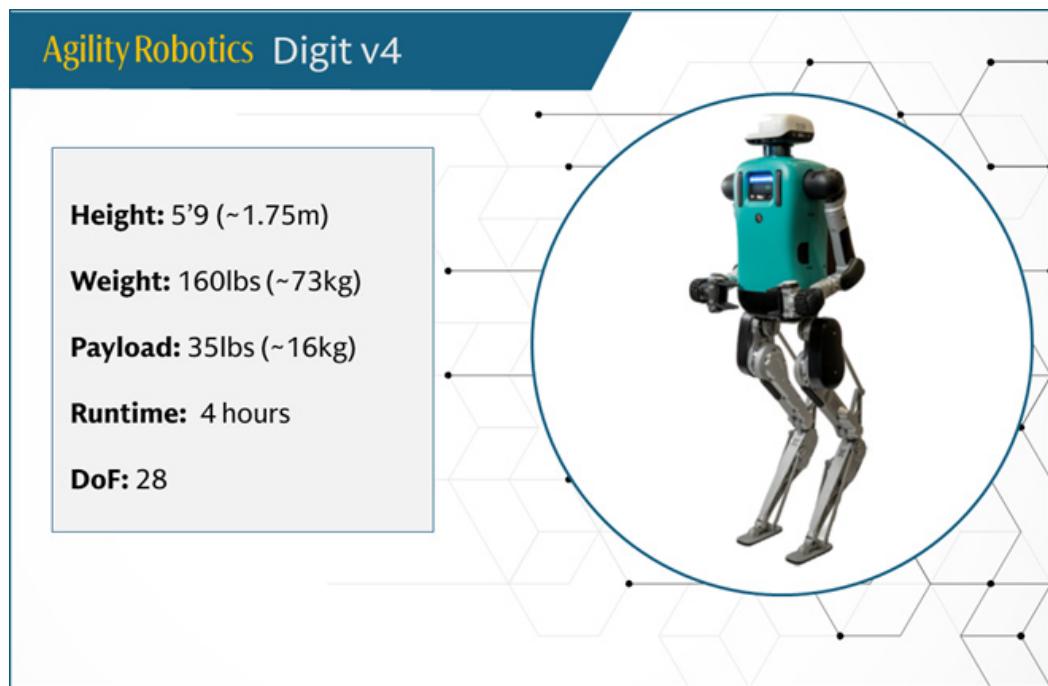
## Spotlight on Agility Robotics

Agility Robotics was founded in 2015 as a spin-off from the Oregon State University

(OSU) Robotics Institute. The company's headquarters are in Salem, Oregon, with an additional office in Pittsburgh, Pennsylvania. Agility Robotics initially developed and introduced Cassie, a bipedal robot (with no torso) that focused on dynamic stability and locomotion in 2016, before introducing Digit. Media reports suggest the company was raising \$400 mn of funding in March/April 2025. The company did a \$150 mn Series B round in 2022.

Digit was introduced in 2017 and included a torso with sensors, a pair of arms for balance, mobility, and manipulation, and additional computing power. The company is using reinforcement learning to help train the locomotion, and AI to train semantics (Gemini is its foundation model, but it is able to use other models if it chooses per company comments). In the summer of 2024, Agility's CEO Peggy Johnson said Digit was on a 2:1 ratio of work to charge time, but the company had a path to reach 4 to 1 and eventually 10 to 1. The company said in a June 2025 interview that it was close to this 10:1 ratio. With its next gen version of Digit, it plans to expand the payload to about 50 lbs, similar to what the OSHA limit is. We show key specs for Digit v4 in the graphic below.

#### Digit v4 - key features and specs



Source: Company data, Goldman Sachs Global Investment Research

**Use cases:** Agility's Digit humanoid can handle roles in the logistics, manufacturing, and supply chain sectors including material and package handling within warehouses and distribution centers for jobs like moving, loading, and unloading totes. It is designed to automate repetitive, physically demanding, or dangerous work and can adapt to various tasks and workflows in existing warehouse operations. Initially it has been deployed in a segregated area for safety, but the company is working to overcome this.

**Key customers:** GXO announced in June 2024 that it signed a multi-year agreement to begin deploying Digit in GXO's logistic operations following its proof of concept pilot in late 2023. Agility and GXO Logistics have deployed several Digit robots at a facility in Georgia, where they assisted with moving over 300K orders in just under a year. Also, in

October 2023, Amazon announced that it was broadening its partnership with Agility and would begin testing Digit to help employees with tote recycling, a highly repetitive process of picking up and moving empty totes once inventory has been completely picked out of them. Agility also partnered with Ford in late 2019/early 2020 to test indoor and first-mile logistics, as well as last-50-feet delivery scenarios (Ford stated on its 1Q25 earnings call that it is not currently using humanoids, but it does utilize AI for efficiency and it has a Boston Dynamics robotic dog in its Valencia plant for detection and inspection tasks). Schaeffler Group, a global motion technology company, has also agreed to purchase Digit humanoids for deployment in 100 of its plants worldwide by 2030.

**Deployment and manufacturing:** Agility Robotics aims to significantly increase deployments, with plans to produce 10,000 Digit robots annually at its new RoboFab factory. In [an interview](#) for Brainstorm Tech 2024, Agility noted that in 2025 it plans to make hundreds of robots, and in 2026 it aims to produce thousands of robots. In 2025, the CEO said it can be up and running in 1 to 1.5 days in a site by utilizing AI.

**Business model:** The company offers its robots both for upfront purchase or with a Robot as a Service (RaaS) model. Over time there would be apps available via software to handle specific tasks, per [an interview](#) from Agility's CEO. At Brainstorm Tech 2024, Agility Robotics noted a target to have a less than two year ROI compared to a \$30 per hour benchmark for its RaaS model.

## Spotlight on Apptronik

Apptronik launched in 2016 out of the Human Centered Robotics lab at the University of Texas. In its early years (2016-2019), the company developed exoskeletons, logistic arms, and early humanoid products for both public and private customers. In 2020, the company completed development of its upper body humanoid, and by 2022 it had its first full humanoid. Apptronik raised \$403 mn as part of its Series A funding round, per its March 2025 [press release](#). Apptronik's CEO and co-founder Jeff Cardenas previously spoke about the company as a part of the GS "Global Automation: Future of Robotics" call series, as detailed [in this note](#).

The company launched its flagship humanoid, Apollo, in 2023. We highlight some of its key specs in the graphic below. Apollo is equipped with 32 actuators, and focuses on linear actuators.

### Apollo - key features and specs

**Apptronik Apollo**

<b>Height:</b> 5'8 (~1.7m)
<b>Weight:</b> 160lbs (~73kg)
<b>Payload:</b> 55lbs (~25kg)
<b>Runtime:</b> 4 hours
<b>DoF:</b> 30

Source: Company data, Goldman Sachs Global Investment Research

**Use cases:** Apptronik has highlighted that Apollo is initially being deployed in structured environments such as in logistics and manufacturing, where it can address labor shortages and perform repetitive or hazardous tasks. This includes moving crates, totes, and boxes; pushing carts; trailer unloading; case picking; and palletization in a warehouse or assisting with tasks such as automotive assembly. Longer term, the company wants to extend into consumer applications and elderly care.

**Current partnerships:** Apptronik has an agreement with **Mercedes** to pilot the use of Apollo robots in Mercedes manufacturing facilities in Germany and Hungary. Apptronik noted that the collaboration is focused on identifying applications for advanced robotics in manufacturing, such as delivering parts and assembly kits to the production line and inspecting components. **GXO logistics** also announced an early-stage proof of concept/R&D initiative program in June 2024 to test Apollo in real-world applications within their logistics operations with the goal of using Apollo with its most labor intensive operations and processes. Lastly, **Jabil** announced a collaboration with Apptronik in February 2025 to help test and scale the Apollo humanoid robots.

**Longer term cost:** The company has suggested that longer term it is targeting a cost below \$50K as production scales and manufacturing costs decrease.

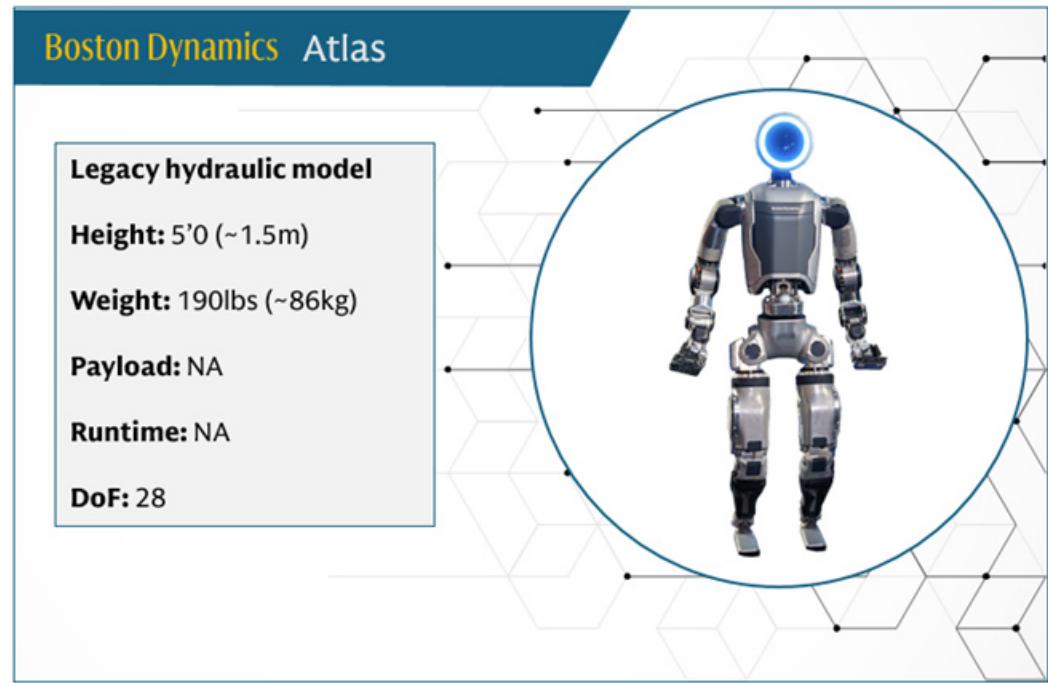
### Spotlight on Boston Dynamics (part of Hyundai)

Boston Dynamics was founded in 1992 as a spin-off from the Massachusetts Institute of Technology (MIT), with its current headquarters in Waltham, Massachusetts. Boston Dynamics was previously acquired by Google in 2013, and sold to SoftBank in 2017. Most recently, Hyundai (covered by Do Hyo Young Kim) acquired an 80% stake in 2021 (with SoftBank retaining the remaining 20%). The company has two commercially

available robots, Spot and Stretch. Spot is a quadrupedal machine resembling a dog that is designed for data collection and surveillance in hazardous or inaccessible environments, and the company previously reported over 1,500 deployments for Spot on its website. Stretch is a mobile robot with multi-directional wheels and a single arm that is built to automate warehouse tasks.

Boston Dynamics' humanoid robot, Atlas, was unveiled in 2013. In 2024 the company unveiled an electric rather than hydraulic version of Atlas.

#### Atlas key specs



Source: Company data, Goldman Sachs Global Investment Research

**Development and use cases:** Early development of Atlas was supported by the Department of Defense for DARPA's robotics challenge, which positioned it as a potential tool for disaster response or use in hazardous environments. The original model was hydraulically powered through an external wired power source. An internal battery was introduced to power the machine's hydraulics in 2015, with subsequent updates focused on mobility and balance. Lidar and sensor technology were incorporated so Atlas could avoid obstacles and assess terrain while in the field. The robot has been shown in videos posted by Boston Dynamics completing various physical feats such as running, jumping over boxes, and performing backflips. The hydraulically powered Atlas was retired in 2024 in favor of a fully electric version.

**Current partnerships:** Boston Dynamics announced a partnership with the Toyota Research Institute (TRI) in October 2024, aimed at accelerating the development of humanoid robots. The agreement will leverage TRI's Large Behavior Models, and aims to improve the dexterity and decision making of the Atlas platform. Boston Dynamics also announced an expansion of their existing collaboration with NVIDIA in March 2025. Atlas will use NVIDIA's Jetson Thor hardware platform to run larger AI models, including NVIDIA's GR00T, directly on board for more advanced decision-making. Atlas will also use NVIDIA's Isaac Lab to virtually simulate physical environments. Hyundai also discussed its plan to use humanoids from Boston Dynamics in its Georgia factory at its

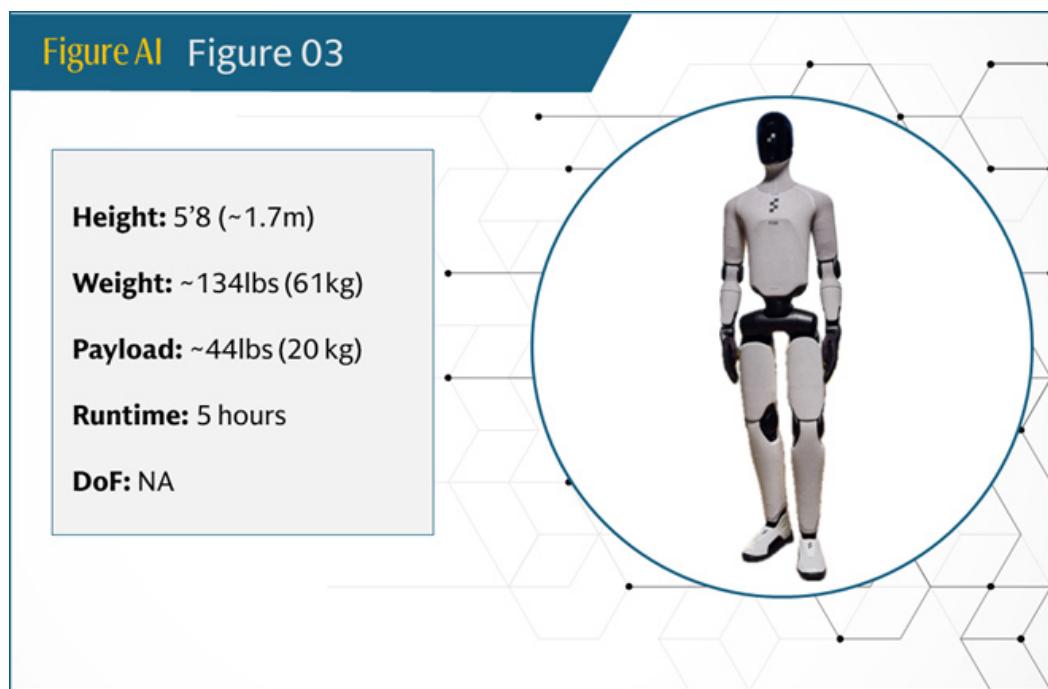
September 2025 investor day and in [this press release](#).

## Spotlight on Figure AI

Figure AI was founded in 2022 by Brett Adcock (who previously founded Archer Aviation and Vetter), and its headquarters are in San Jose. Figure AI publicly showcased bipedal walking capabilities in 2023 with the Figure 01 robot. Figure raised over \$1 bn in its Series C financing, per the company in a September 2025 press release.

One of the key aspects the company highlights is its approach to AI, and Figure announced in February 2025 that it was ending its collaboration with OpenAI to focus on its own foundational model. The company utilizes its generalized Vision-Language-Action (VLA) model, Helix. Per the company, Helix allows the humanoid to perceive its surroundings, understand commands in natural language, and manipulate objects. Helix also supports multi-robot collaboration, allowing multiple robots to work together on complex tasks. The company showcased a video of two Figure 02 robots in February 2024 that worked together to put away groceries. Figure has cited training data as a key focus, and has a strategic partnership with Brookfield to help with this.

The third-generation bot, Figure 03, was unveiled on October 9th, 2025, featuring improved hardware and software including a soft textile overlay, redesigned sensory kit, improved audio hardware (for better real time speech), wireless charging, and an improved battery. On the improved sensory kit, Figure highlighted its internally developed tactile sensors in the hand/fingertips that per the company enables more stable grasps across objects of varied shapes and sizes. The company noted that each fingertip sensor can detect forces as small as three grams of pressure (enough to detect a paper clip). In addition, there is a camera in each hand to help with tasks where vision from the head is occluded. Finally, the company discussed how Figure 03 was engineered for higher volume manufacturing with a reduced part count.

**Figure 03 - key features and specs**

Source: Company data, Goldman Sachs Global Investment Research

**Use cases:** Figure AI has highlighted the potential for its robots to work in markets such as manufacturing, logistics, retail and in the home. Figure 02 and 03 have been shown doing tasks such as component placement, materials handling, sorting packages, and helping with home chores like loading a dishwasher or folding laundry.

**Key customers:** The Figure 02 has already been tested with BMW in its factory in Spartanburg, South Carolina, where it performed tasks to support the assembly of vehicles, and Figure commented on X in October 2025 that it has been operating for over 5 months at 10 hours per day on the BMW body shop line. In early 2025, Figure AI announced that it had signed another commercial client.

**Deployment and manufacturing:** Figure AI commented on X in early 2025 that between BMW and the other commercial customer, it could lead to the shipment of 100,000 robots over the next four years. Additionally, in March 2025 the company announced BotQ, a manufacturing facility designed to produce up to 12,000 humanoids per year. The company noted it has the ability to scale from there.

**Cost of the robot:** Figure suggested on X in October 2024 that some humanoids in the industry could reach the \$20-\$30K price point.

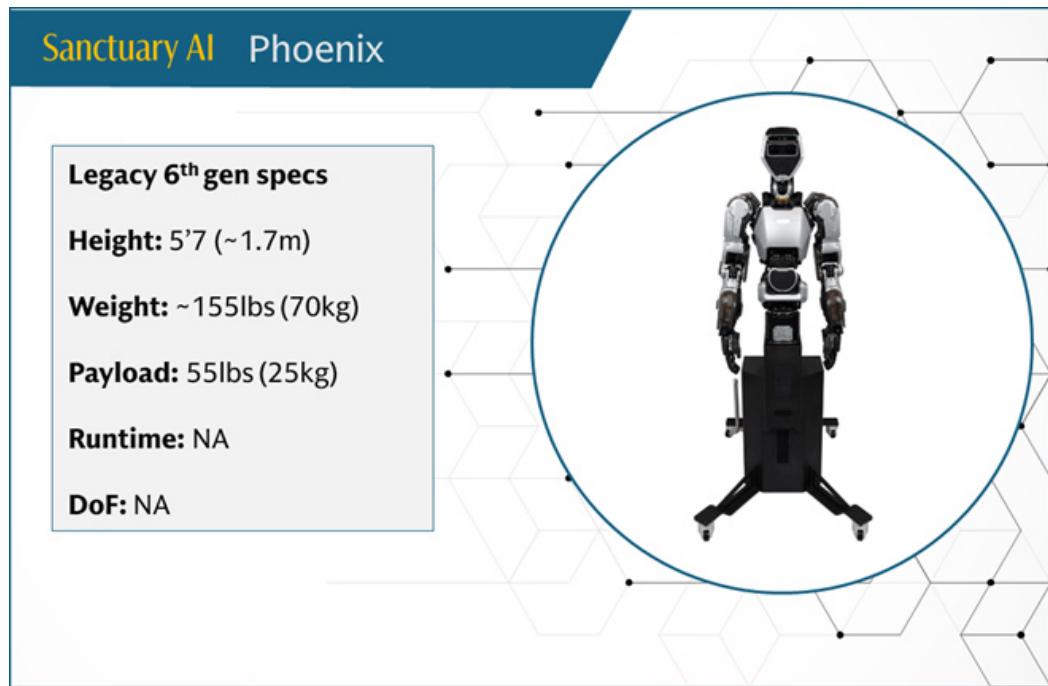
## Spotlight on Sanctuary AI

Sanctuary AI is a Vancouver, Canada based company founded in 2018 that focuses on developing general-purpose humanoid robots, with a particular focus on touch capability and dexterity in the hands.

Sanctuary commercially deployed its first humanoid in early 2023 utilizing its 5th gen Phoenix robot, where the robot successfully completed over 100 retail-related tasks

during a week-long pilot. The robotic hands employ a hydraulic actuation approach and tactile sensing technology to allow in-hand manipulation and leading dexterous technology, per the company and as detailed in this video. The hands have 21 DOF. While the 6th gen version of the Phoenix has legs, the more recent Phoenix 8 has wheels.

#### Phoenix Key Specs



Source: Company data, Goldman Sachs Global Investment Research

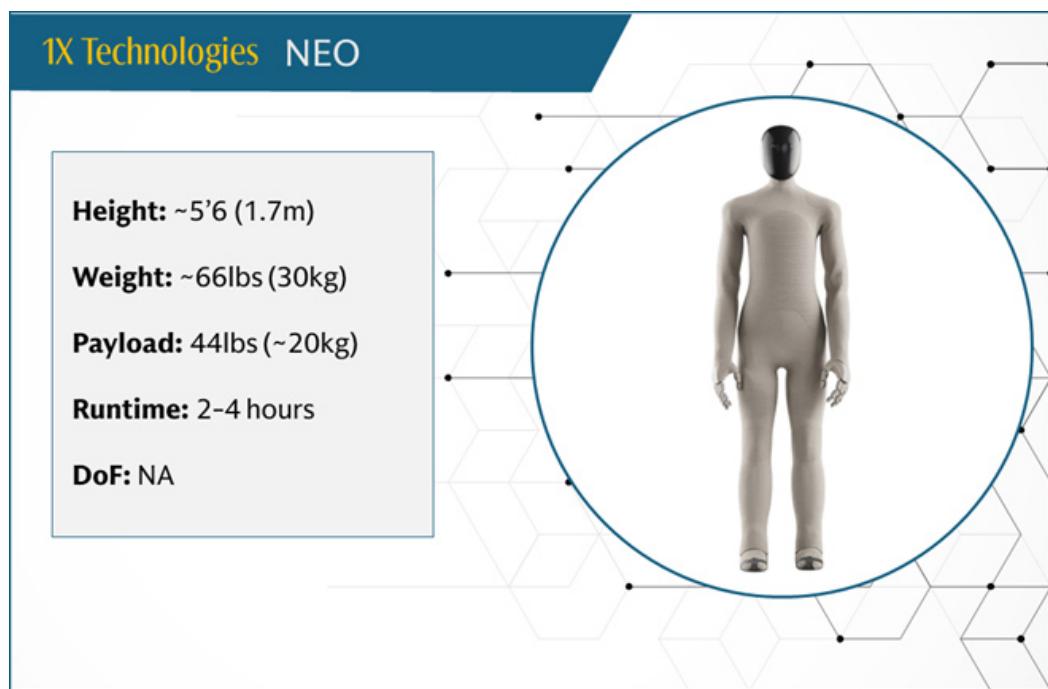
**Use cases:** In March 2023, Sanctuary AI announced its first commercial deployment, where a waist-up Phoenix robot completed over 100 retail-related tasks at Canadian Tire Corporation. These tasks included choosing and packing merchandise, cleaning, tagging, labeling, and folding items. Longer term the company plans to expand to a diverse set of sectors including manufacturing, logistics, warehousing, retail, and automotive.

**Current partnerships:** Canadian automotive supplier Magna, an investor in Sanctuary AI since 2021, is piloting the robots in its manufacturing facilities as part of a strategic partnership.

## Spotlight on 1X Technologies

1X Technologies was founded in 2014 under the name Halodi Robotics, with current headquarters in Palo Alto, California. The company rebranded to its current name in 2022 when it shifted its primary focus to domestic robots. 1X raised a \$100 mn Series B round in January 2024, per the company.

1X's first humanoid robot was EVE. EVE has a wheeled base and was designed for industrial and logistical tasks. It launched its bipedal platform NEO in 2024, aiming to develop humanoids for home use. Both the EVE and NEO run 1X's proprietary Redwood AI model, which it states allows the robots to dynamically translate visual and audio input into decisions and precise movements.

**NEO key specs**

Source: Company data, Goldman Sachs Global Investment Research

**Use cases:** 1X Technologies initially indicated that it was targeting industrial end markets to perform labor intensive tasks with EVE. 1X shifted its priority to domestic humanoids in 2022, with the goal for the NEO platform to perform everyday tasks such as cleaning, folding clothes, and washing dishes.

**Key customers:** EVE was deployed in factories globally in 2022 to handle industrial tasks autonomously. ADT Commercial announced in 2023 that it was testing EVE to conduct patrol and surveillance duties at commercial buildings at nighttime. ADT Commercial also noted EVE's virtual reality capabilities, with an offsite human operator able to pilot the robot if necessary. It commented about future benefits by reducing the need to send humans to remote or high-risk environments. Later in 2023, 1X's CEO also revealed that EVE robots had been deployed in similar patrol/surveillance capacities at two unnamed industrial sites. NEO is not commercially available yet, but the company announced plans to start testing robots in several homes by the end of 2025. These home tests will rely on virtual reality, with remote operators fully controlling the robots to collect data.

## Company details

**Tesla (TSLA):** We are Neutral rated on the stock. Our 12-month price target of \$425 is based on 150X Q5-Q8E EPS including SBC. Key downside risks to our view relate to potentially larger vehicle price reductions than we expect, increased competition in EVs, a larger than expected tariff impact, slower EV demand, delays with products/capabilities like FSD/4680, key person risk, the internal control environment, margins, and operational risks associated with Tesla's high degree of vertical integration. Upside risks include faster EV adoption and/or share gain by Tesla, a stronger macroeconomic environment for new vehicle sales more generally, earlier new product launches than we expect, an earlier/larger impact from AI enabled products (e.g., FSD,

Optimus and robotaxis), and a smaller than expected tariff impact than we currently anticipate.

**Jabil (JBL):** We are Buy rated on the stock. Our 12-month price target of \$252 is based on 22X applied to our Q5-Q8 EPS estimate including SBC. Key risks to our view relate to revenue growth (including due to macro factors, tariffs, market share, and program mix), its ability to continue to expand margins vs. history, and FCF.

**Flex (FLEX):** We are Buy rated on the stock. Our 12-month price target is \$66, which is based on 22X applied to our Q5-8 EPS estimate including SBC. Key risks to our view relate to macroeconomic demand, supply/demand dynamics, Flex's ability to expand margins, tariff impacts and geopolitical uncertainty, and FCF.

**TE Connectivity (TEL):** We are Buy rated on the stock. Our 12-month price target of \$263 is based on 25X applied to our normalized EPS estimate of \$10.50. Key downside risks relate to end demand, the impact of EVs and new car architectures on automotive content for TE, unfavorable commodity pricing, potential tariff impacts, and TE executing on its margin expansion plan.

**Amphenol (APH):** We are Buy rated on the stock. Our 12-month price target of \$139 is based on 38X applied to our normalized EPS estimate of \$3.65. Key downside risks to our view relate to revenue growth, margins, the trade situation with China (given Amphenol's presence in the country with several manufacturing sites), and Amphenol's ability to continue to execute well on M&A.

**Harmonic Drive Systems (HDS, covered by Yuichiro Isayama):** We reiterate our positive stance on Harmonic Drive Systems (HDS) as a core beneficiary of humanoid robot development, underpinned by its dominant global position in precision speed-reduction gears — a critical component for torque generation and motion accuracy — across both industrial robots and humanoid platforms (ex-China).

Based on our management discussions, HDS has already established relationships with around 15 major humanoid customers since the segment's emergence, the majority of which are U.S. players with advanced AI and capital capabilities. We view this customer mix as strategically advantageous, positioning HDS at the forefront of next-generation robotics innovation.

We also highlight that the progression of humanoid technology is increasingly constrained by the need to integrate the "brain" (AI) and "body" (hardware). This convergence cannot advance in isolation, elevating the importance of credibility in joint development and deep mechanical know-how. In our view, this growing interdependence between AI architecture and high-precision motion systems structurally reinforces HDS's role as a key enabler within the humanoid ecosystem.

We are Buy-rated on the stock. Our 12-month target price of ¥5,000 is based on FY3/29E EV/EBITDA, applying the sector-average multiple of 9X and a 70% sector-relative premium, with the obtained theoretical value discounted back to the midpoint of FY3/27E and FY3/28E with a capital cost of 10%. Key downside risks include (1) weaker capex appetite in tech industries, mainly smartphones and semiconductors, (2) greater commitment to the lower-margin auto components business, and (3) less focus on shareholder returns and dialogue with capital markets.

**Greater China Technology:** There are several companies from the China Technology

ecosystem (where coverage is led by Allen Chang) with exposure including Lingyi (components and assembly), Hon Hai (components, software and assembly), Luxshare (components and assembly), Quanta (listed subsidiary to mass produce humanoid robots in 2026E), Hikvision (robot components and assembly, expanding to humanoid robots), Huaqin (acquired robot companies, expanding to humanoid robots), iFlytek (AI software), and Sensetime (AI software).

## Disclosure Appendix

### Reg AC

We, Mark Delaney, CFA, Jacqueline Du, Yuichiro Isayama, Allen Chang, Will Bryant, Aman Gupta and Ayush Ghose, hereby certify that all of the views expressed in this report accurately reflect our personal views about the subject company or companies and its or their securities. We also certify that no part of our compensation was, is or will be, directly or indirectly, related to the specific recommendations or views expressed in this report.

Unless otherwise stated, the individuals listed on the cover page of this report are analysts in Goldman Sachs' Global Investment Research division.

### GS Factor Profile

The Goldman Sachs Factor Profile provides investment context for a stock by comparing key attributes to the market (i.e. our universe of rated stocks) and its sector peers. The four key attributes depicted are: Growth, Financial Returns, Multiple (e.g. valuation) and Integrated (a composite of Growth, Financial Returns and Multiple). Growth, Financial Returns and Multiple are calculated by using normalized ranks for specific metrics for each stock. The normalized ranks for the metrics are then averaged and converted into percentiles for the relevant attribute. The precise calculation of each metric may vary depending on the fiscal year, industry and region, but the standard approach is as follows:

**Growth** is based on a stock's forward-looking sales growth, EBITDA growth and EPS growth (for financial stocks, only EPS and sales growth), with a higher percentile indicating a higher growth company. **Financial Returns** is based on a stock's forward-looking ROE, ROCE and CROCI (for financial stocks, only ROE), with a higher percentile indicating a company with higher financial returns. **Multiple** is based on a stock's forward-looking P/E, P/B, price/dividend (P/D), EV/EBITDA, EV/FCF and EV/Debt Adjusted Cash Flow (DACP) (for financial stocks, only P/E, P/B and P/D), with a higher percentile indicating a stock trading at a higher multiple. The **Integrated** percentile is calculated as the average of the Growth percentile, Financial Returns percentile and (100% - Multiple percentile).

Financial Returns and Multiple use the Goldman Sachs analyst forecasts at the fiscal year-end at least three quarters in the future. Growth uses inputs for the fiscal year at least seven quarters in the future compared with the year at least three quarters in the future (on a per-share basis for all metrics).

For a more detailed description of how we calculate the GS Factor Profile, please contact your GS representative.

### M&A Rank

Across our global coverage, we examine stocks using an M&A framework, considering both qualitative factors and quantitative factors (which may vary across sectors and regions) to incorporate the potential that certain companies could be acquired. We then assign a M&A rank as a means of scoring companies under our rated coverage from 1 to 3, with 1 representing high (30%-50%) probability of the company becoming an acquisition target, 2 representing medium (15%-30%) probability and 3 representing low (0%-15%) probability. For companies ranked 1 or 2, in line with our standard departmental guidelines we incorporate an M&A component into our target price. M&A rank of 3 is considered immaterial and therefore does not factor into our price target, and may or may not be discussed in research.

### Quantum

Quantum is Goldman Sachs' proprietary database providing access to detailed financial statement histories, forecasts and ratios. It can be used for in-depth analysis of a single company, or to make comparisons between companies in different sectors and markets.

### Disclosures

#### Rating and pricing information

Amphenol Corp. (Buy, \$121.70), Flex (Buy, \$56.59), Harmonic Drive Systems Inc. (Buy, \$3,300), Jabil Circuit Inc. (Buy, \$193.99), TE Connectivity Plc (Buy, \$214.57) and Tesla Inc. (Neutral, \$413.49).

#### Financial advisory disclosure

Goldman Sachs and/or one of its affiliates is acting as a financial advisor in connection with an announced strategic matter involving the following company or one of its affiliates: Amphenol Corporation.

#### Company-specific regulatory disclosures

The following disclosures relate to relationships between The Goldman Sachs Group, Inc. (with its affiliates, "Goldman Sachs") and companies covered by Goldman Sachs Global Investment Research and referred to in this research.

Goldman Sachs expects to receive or intends to seek compensation for investment banking services in the next 3 months: Agility Robotics Inc.

Goldman Sachs had an investment banking services client relationship during the past 12 months with: Agility Robotics Inc.

**The rating(s) for Amphenol Corp., Flex, Jabil Circuit Inc., TE Connectivity Plc and Tesla Inc. is/are relative to the other companies in its/their coverage universe:** Amphenol Corp., Aurora Innovation Inc., Belden Inc., BorgWarner Inc., Cerence Inc., ChargePoint Holdings, Flex, Ford Motor Co., General Motors Co., Gentex Corp., Innoviz Technologies, Jabil Circuit Inc., Keysight Technologies Inc., Lear Corp., Luminar Technologies Inc., Magna International Inc., Mobileye Global Inc., QuantumScape Corp., Rivian Automotive Inc., Sensata Technologies Holding, Symbotic Inc., TE Connectivity Plc, Tesla Inc., Vertiv Holdings, Visteon Corp.

**The rating(s) for Harmonic Drive Systems Inc. is/are relative to the other companies in its/their coverage universe:** CKD Corp., Daifuku Co., Daikin Industries, Fanuc, Harmonic Drive Systems Inc., Hitachi Construction Machinery, Hoshizaki Corp., IHI, Japan Material, Japan Steel Works, Kawasaki Heavy Industries, Keyence, Komatsu, Kubota, Kurita Water Industries, Makita, Misumi Group, Mitsubishi Heavy Industries, Nomura Micro Science, Okuma Corp., Omron Corp., Organo Corp., SKY Perfect JSAT Corp, SMC, THK, Takeuchi MFG, Yaskawa Electric

#### Company-specific regulatory disclosures

Compendium report: please see disclosures at <https://www.gs.com/research/hedge.html>. Disclosures applicable to the companies included in this compendium can be found in the latest relevant published research

#### Distribution of ratings/investment banking relationships

Goldman Sachs Investment Research global Equity coverage universe

	Rating Distribution			Investment Banking Relationships		
	Buy	Hold	Sell	Buy	Hold	Sell
Global	49%	34%	17%	63%	58%	42%

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