ROBO Global Index 4Q24 Commentary

As of December 31, 2024

The Robo Global Robotics and Automation Index (ROBO) returned -0.57% during the fourth quarter of 2024. Six of the eleven subsectors finished in positive territory, led by **Autonomous Systems** (+51.6%), **3D Printing** (+10.7%), **Food and Agriculture** (+4.4%), and **Computing & AI** (+4.1%). Lagging subsectors included **Sensing** (-16.4%), **Healthcare** (-3.9%), **Logistics Automation** (-2.7%), and **Manufacturing & Industrial Automation** (-2.1%). Despite an overall better-than-expected quarter amid improving market conditions for 2025, Currency Impact emerged as a significant detractor, having an impact of -4.1%.

The **Sensing** subsector, which includes notable companies like **Samsara** (a multi-year outperformer), experienced an unusual decline across all companies. This weakness stemmed from muted end-market exposure, primarily due to decreased Purchasing Managers' Index (PMI) activity. However, we anticipate a recovery as industry geographical diversification and US reshoring efforts materialize following post-election clarity.

In **Actuation**, **Hiwin**, a leading Taiwanese motion control systems provider and long-time supplier to Boston Dynamics' humanoid and quadruped robots, continues to exemplify the subsector's potential. As discussed in previous reports, companies in this space are well-positioned to benefit from the increased development and deployment of diverse robotic forms.

Autonomous Systems saw our Q2 2024 addition, EVTOL designer and developer **Joby Aviation**, soar 61.6% as they continue to hit milestones and possibly begin commercial operations in the near future. We also added Serve Robotics, which develops last-mile autonomous delivery robots, to the subsector entering 2025.

Robotics is gaining mainstream traction, with leading technology companies increasingly focusing on physical automation as the next frontier. From fully autonomous factories and humanoid robots to drones and beyond, the industry is experiencing a renaissance driven by advances in both AI and energy technology. Global manufacturing is shifting away from China toward India, Vietnam, Mexico, and local markets through reshoring initiatives. Looking ahead to 2025, the robotics industry is poised for further growth, supported by lower interest rates, post-election clarity in the United States, and ongoing initiatives to improve efficiencies and reduce dependencies.

The most significant transformation is expected to come from dramatic reductions in inference time and costs. This advancement becomes particularly powerful when combined with "downloadable skills" that have been developed and refined in sophisticated simulations—effectively compressing years of learning and testing into condensed timeframes. Ultimately - we are just starting to see the potential through demos and early adoption of these newer methods.

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