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AS DEMAND FOR ROBOTICS AND AI EXPANDS, ROBO INDEX MARKS SIXTH CONSECUTIVE QUARTER OF DOUBLE-DIGIT EARNINGS GROWTH

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SUMMARY

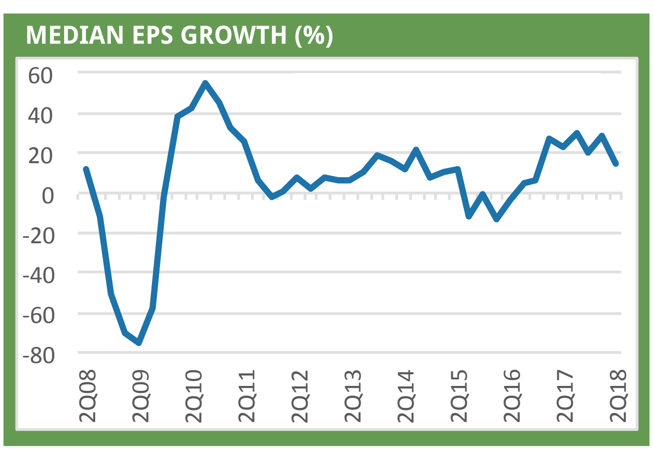
With the earnings season coming to a close, the ROBO Global Robotics & Automation Index has recouped its 2Q losses and risen over 6% in July and August. 2Q18 marked the sixth consecutive quarter of double-digit earnings growth, with median EPS growth of 14% YoY. This leaves the index trading on a forward PE of 22x, in line with its long-term average.

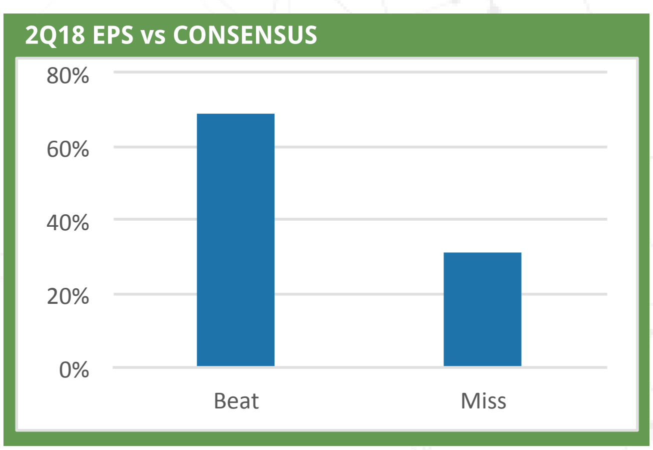
Results across the index were impressive, with 70% of index members beating consensus estimates.[1] Revenue growth of 9% was led by Consumer Robotics, Security & Surveillance, 3D Printing, and Sensing sectors, and while growth in Manufacturing & Industrial Automation did slow somewhat compared to the elevated levels we saw in 2017, the sector delivered 9% growth for the quarter.

Inside, we discuss some of the more interesting trends that emerged from the results of the 86 members of the index, including strong demand for Industrial Robotics, a return to growth in 3D Printing, and the increasing prevalence of Artificial Intelligence (AI), among others.

The index marked its sixth consecutive quarter of double-digit EPS growth.

Median EPS growth for 2Q18 stood at 14% YoY. While slower than the record 29% in 1Q18, the current growth marked the sixth consecutive quarter of double-digit EPS growth for ROBO. 70% of companies beat consensus EPS estimates and 71% beat revenue estimates.





[1] Source for all index member results: Factset Research Systems. Price as of 8/31/18 close.

Median sales growth moderated to 9% from 11% in the prior quarter, weighed down by foreign currency headwinds and slower growth in the industrial-related sectors of the index. Consumer Robotics (+23%), Food & Agriculture automation (+19%), Security & Surveillance (+21%), Energy (+14%), 3D Printing (+11%) and Sensing (+10%) led the gains, while Actuation (+10%) and Manufacturing & Industrial Automation (+9%) slowed from the elevated levels of 2017.

With management teams generally upgrading their outlooks for the year, earnings estimates have stabilized and resumed their upward trajectory. Consensus estimates now point to 17% EPS growth for the current year and 15% for 2019, according to Factset. This leaves the ROBO Global Robotics & Automation Index trading on a forward PE of 22.5x, in line with the 22.1x average since the inception of the index in 2013 and down slightly from 26x one year ago.

ROBO Global Robotics & Automation Index - ntm PE

2Q HIGHLIGHTS

Demand for industrial robotics remained strong.

With few exceptions, the world's top suppliers reported continued growth in revenue and orders. At ABB, orders grew 11% in Robotics and Motion, and 15% in Industrial Automation. Teradyne's Universal Robot, the leader in collaborative robots, delivered record margins and is on track to grow sales by more than 52% in 2018. Fanuc reported better than expected orders and Industrial Robot sales grew 7%. This was despite a decline in demand from automotive OEMs and tier-one suppliers in the United States, after an exceptionally strong 2017. Uncertainty around trade policy is the main concern that seems to be holding back investments. However, increased adoption in other industries, such as Electronics, Logistics, Consumer Products, Pharmaceuticals and Food & Beverage continues to drive robot sales growth.

Manufacturing & Industrial Automation showed mixed signals.

Certain areas of the supply chain for Manufacturing & Industrial Automation faced challenges. Fanuc warned of a drop-off in demand for its CNCs and servo motors from Chinese machine tool builders in June. Airtac and Hiwin THK experienced similar order slowdowns in the same month. Others, like Omron, Rockwell Automation, Siemens, and Mitsubishi Electric, remained very positive. Harmonic Drive talked down fears of order declines, with no signs of further deterioration. In the words of THK's CEO Teramachi, underlying demand remains firm and volatility in orders is due to the very extended backlogs and lead times experienced in the past 12 months. We note that the market clearly discounted these concerns during 2Q, when Japanese exporters in particular took a nosedive.

3D Printing soared, with median sales growth hitting 10%—the highest since 2015.

After struggling to deliver revenue growth in recent quarters, 3D Systems and Stratasys appear to have turned the corner, helped by new product launches, improved sales execution, and continued adoption of additive manufacturing in core markets. One example: 3D Systems' NextDent 5000 is transforming digital dentistry with its high-speed 3D printer that prints dental devices and fixtures with up to 4x faster speeds than comparative offerings, as well as an incredible 90% cost savings compared to conventional methods. And though Stratasys lagged in sales growth, the company reported positive news around adoption of its additive manufacturing technology, especially its high-end applications for government, aerospace, and automotive. 3D measurement specialist Faro traded up 17% after it announced orders grew 20% in the quarter and operating margins turned positive. SLM Solutions also saw positive average order growth of 10% YoY in 2Q. At SLM, the company is focusing more on long-term contracts, pushing out its largest growth into 4Q.

Semiconductor earnings were better than expected.

An effort by chipmakers to drive growth in core markets such as Datacenter and Automotive translated into revenue and earnings growth. Nvidia's sales growth is up 40% YoY, and its Volta GPU continues to dominate in the hyper scale and cloud provider landscape with data center revenue growing 83% YoY. Meanwhile, revenues at Xilinx grew 14% YoY, driven by a strong product portfolio as the company transitions into a platform company from an FPGA provider. After seeing a weakness in demand for its smartphones in 1Q, National Instruments reported surprisingly bullish results due to broad-based strength across the remainder of its portfolio. Teradyne's memory test business grew 34% driven by share gains, and its system-on-chip (SoC) testing systems also delivered solid results with 20% YoY growth. Microchip saw 11% sequential growth in microcontrollers, and 35% growth in analog. Qualcomm experienced strong growth during 2Q, but the bigger news was the company's intention to terminate its acquisition of NXP due to the heightened geopolitical environment. With an aggressive stance in diversifying its portfolio and a cash balance of $36 billion, we anticipate the company to make another M&A move in the coming months.

Healthcare outperformed based on strong fundamentals.

Intuitive Surgical and Novanta continued to demonstrate strong momentum as broad-based growth in life sciences and minimally invasive surgery continues to drive adoption. Novanta reported its seventh consecutive quarter of high single-digit organic growth as design wins increased by more than 25% YTD and revenues from China increased by more than 30% YoY. At Intuitive Surgical, new platforms and strong procedure growth in key categories point to continued momentum in 2H and beyond. Accuray, the radiation oncology specialist, also posted strong results with gross orders growing by double digits. The next-generation sequencing portfolio from Molecular Diagnostic's company Qiagen continued to deliver double-digit growth. The reason: steady customer demand for universal solutions and its delivery of a complete NGS workflow for gene panel testing with the GeneReader NGS System. Meanwhile, Mazor Robotics had disappointing results, largely due to slower-than-expected demand for its Medtronic MazorX system. Despite that challenge, its robotic system shipments increased 25% YoY.

MOVERS & SHAKERS

iRobot up 24% QTD

iRobot is a leading provider of consumer robots for the connected home, offering advanced mapping, navigation, mobility, and AI technologies for hi-tech vacuum and mopping devices. iRobot delivered strong 2Q revenue growth of 24% YoY, driven by growth across all major regions. EMEA and Japan drove most of the upside with YoY growth of +51% and +31%, respectively. As a result, iRobot raised its 3Q outlook to 20-22% YoY growth, which includes anticipated product launches in 2H of this year. The company is experiencing strong momentum in its underlying fundamentals with stable market share, strong gross margins, upside from EMEA driven by its acquisition of the largest distributor, and new product introductions.

3D Systems up 27% QTD

3D Systems is a market leader in end-to-end 3D solutions for design and development in industries such as aerospace, automotive, healthcare, dental, and durable goods. 3D Systems shares rose over 27% after delivering strong 2Q results driven by 3D printers and strong sales execution. The good news is largely due to early returns on the investments made over the past two years. Revenues, gross margin, and EPS all beat Wall Street's expectations. Specifically, printer revenue grew 41% this quarter, driven by a 37% increase in 3D printer unit sales and continued growth in materials and software. Healthcare-related revenue increased 26% as demand trends for all categories of healthcare were better than expected due to new product introductions. 3D expects to announce several new launches for later in the year and has already started shipping several of its newest products.

Brooks Automation up 27% QTD

Brooks is a provider of automation, vacuum, and instrumentation equipment for the semiconductor and life sciences markets. Brooks had a solid 2Q but a lowered outlook for 3Q on mixed demand trends for its vacuum robot automation segment. For 2Q, total revenues rose 8% sequentially and are up 23% YoY. Revenues for semiconductor revenue were up 20% YoY, driven by strength in vacuum automation and advanced packaging, and early signs of a rebound in contamination control. Meanwhile, the company's life sciences revenue continues to grow at a steady pace, up 35% YoY. Growth was led by storage services, which increased 44% YoY. After its EPS report, Brooks made a surprise announcement of its intention to divest its cryogenic vacuum division to Atlas Copco for $675M in cash, boosting the stock up more than 30%. The company has stated that it plans to use the influx of cash to fund a transformative acquisition in life sciences. For more on Brooks Automation, see the ROBO Global Index Member Spotlight.

Maxar Technologies down 35% QTD

Maxar is a global leader in end-to-end space solutions, including high-resolution satellite imagery and data analytics, communication satellite manufacturing, ground-stations, radar satellites, and space robotics. The company reported slightly better than expected results and reaffirmed guidance. However, shares were under pressure due to a negative report by Spruce Research highlighting the company's lack of cash-flow generation and possible weaknesses in its satellite manufacturing business. Shares are reflecting these concerns while the company is taking steps to improve its margin profile. Vertical integration with Digital Globe drives a broad and diversified product portfolio, and post-merger synergy plans are on track as evidenced by improved margins in the imagery segment. A number of potential earnings growth drivers are pushing future expectations, such as the growing global need for satellite imagery and data analytics from satellite operators and the US government.

Mazor Robotics down 24% QTD

Mazor is a developer of innovative surgical guidance systems. It specializes in robotic, computerized, and imaging-based systems primarily in the field of spine surgery. Mazor shares declined 24% after missing analyst forecasts due to lower pricing terms under the distribution agreement with Medtronic. Investors are awaiting positive contributions from this partnership, and the transition appears to be taking longer than expected. However, strong interest and demand for Mazor X continues, and the sales pipeline is widening due to sales efforts by Medtronic. For the 1H of the year, the number of robotic guidance systems sold increased

32% YoY. Meanwhile, an upcoming catalyst is the joint platform release of the Mazor X Stealth Edition system that integrates its legacy Stealth navigation system with the Mazor X platform. The company will unveil this new product at the North American Spine Society (NASS) conference in late September in Los Angeles.

Optex down 20% QTD

Optex, the sensor specialist with strong positions in security and factory automation, declined 20% after reporting weaker than expected 2Q18 results. While management maintained its full-year outlook, it also warned that looming component shortages, rising investments, and declining ASPs could continue to weigh in the short term. Sales grew 5% in Q2, slightly down from 8% in Q1, as the security sensor business contracted in Japan by 17% and was offset by a 25% increase in the Americas. Machine Vision grew 8% in Q2, somewhat short of expectations, due to deficiencies in ceramic condensers resulting from component shortages. Optex announced investment in a new manufacturing facility to consolidate its factory automation and machine vision manufacturing operations.

YEAR-TO-DATE PERFORMANCE

Total return by subsector, year to date (%)

Total return by sector (%)	Year to date	Past 12m
3D Printing	34	33
Actuation	-20	-6
Computing, Processing, & AI	22	11
Consumer Products	48	21
Energy	30	42
Food & Agriculture	0	22
Healthcare	25	26
Integration	-6	6
Logistics Automation	10	22
Manufacturing & Industrial Automation	-11	10
Security	8	25
Sensing	8	26
TOTAL	**4**	**17**

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