

# ROBO GLOBAL Q3 IN REVIEW:

*ROBO, HTEC, and THNQ*

## SUMMARY

The Robotics & Automation Index ([ROBO](#)), the Artificial Intelligence Index ([THNQ](#)), and the Healthcare Technology & Innovation Index ([HTEC](#)) were not immune to the September sell-off in equity markets and declined marginally in Q3. While investors debate the near-term growth and inflation outlook, businesses around the world are striving to accelerate their digitization and deploying automation at a record pace. In this report, we discuss key trends and big movers across our innovation portfolios.

## PERFORMANCE 3Q2021 (%)

ROBO Global Indices		3Q2021	1-year	3-year	5-year
ROBO	Robotics & Automation	-0.68%	35.78%	16.53%	19.09%
THNQ	Artificial Intelligence	-0.66%	33.37%	26.93%	33.32%
HTEC	Healthcare Technology & Innovation	-5.28%	31.12%	24.75%	31.39%
Global Equities					
ACWI	AC World Equities	-1.05%	27.44%	12.54%	13.19%

Prior to 30 April 2019, HTEC data is based on simulated back-casted data. Prior to 21 August 2018, THNQ data is based on simulated back-casted data. 3-year and 5-year returns are annualized.

## MARKET COMMENTARY

Global equities declined 1% in the third quarter of 2021, with marginal gains in the US largely offset by declines in emerging markets and a sell-off in China in particular. While strong earnings had supported stocks in the run-up to August, growth and inflation concerns led to declines in September, erasing prior gains. Against that backdrop, the ROBO Global indices demonstrated resilience, with the Robotics & Automation Index declining 0.7%, the Artificial Intelligence Index declining 0.7%, and the Healthcare Technology & Innovation Index declining 5.3%. As shown in the table above, the three research-driven strategies have largely outperformed the MSCI AC World Index over the past one, three, and five years.



Our view that 2021 would be a boom year has largely played out and the global economic rebound continues to maintain significant momentum. And with the Delta variant wave having peaked, we see ample room for earnings to continue to grow above historical averages as pent-up demand for re-engagement is unleashed. However, investors are growing increasingly concerned about the rising spectrum of inflation and a potential need for a more meaningful tightening of monetary policy. Indeed, policy makers around the world have remained surprisingly supportive of massive fiscal and monetary stimulus in the face of rising prices and increasingly conspicuous shortages – think semiconductors, but also labor, in the US.

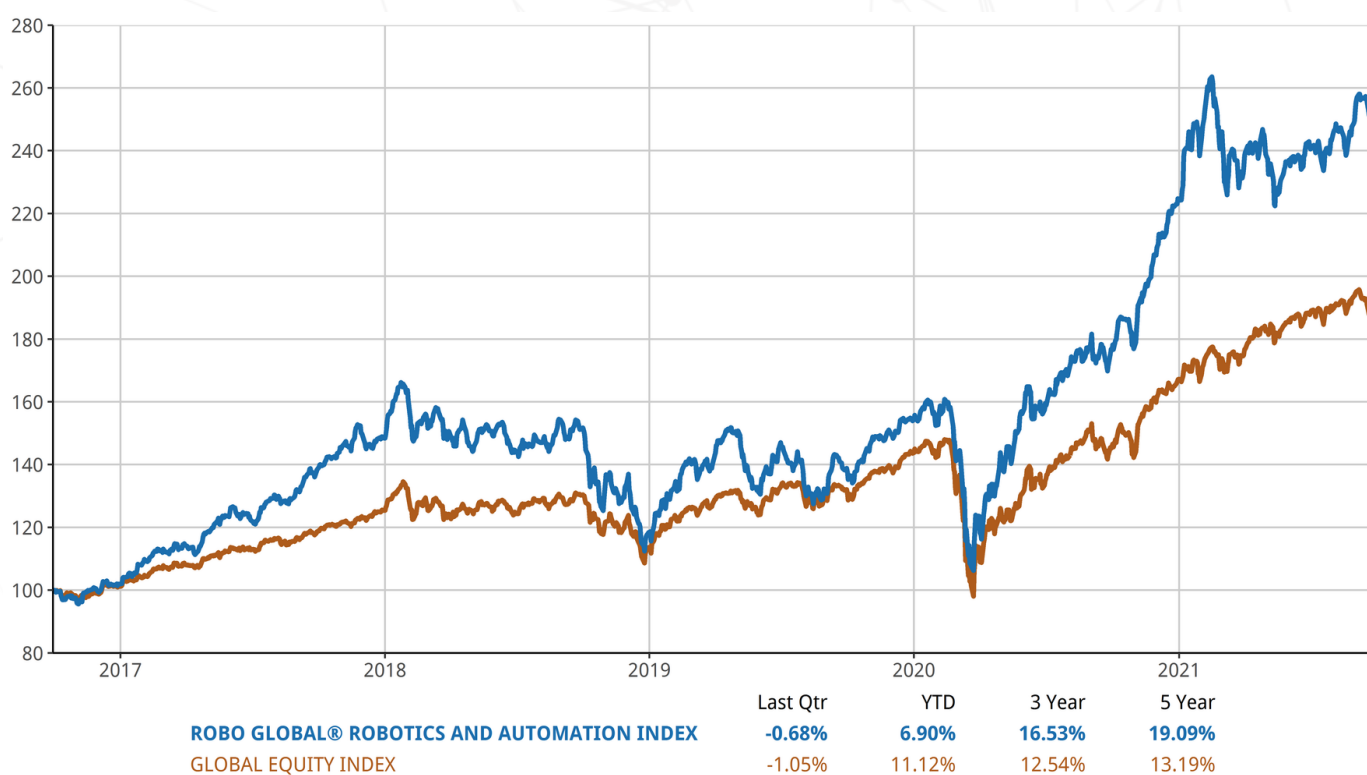
While they certainly would not be immune to a meaningful correction in the equity markets, we believe our Robotics, AI, and Healthcare Technology portfolios are well positioned to capture the long-term growth and returns presented by this technology revolution and accelerated by the COVID-19 pandemic. Businesses around the world are striving to digitize and automate to increase efficiency and adapt to rapid changes in consumer expectations. This has led to a clear acceleration in M&A in the past 18 months, despite the significant business disruptions during the pandemic. In fact, it's fair to say that robotics, AI, and healthcare technology are seeing a perfect storm of capital. Three quarters into 2021, we are looking at another record year for mergers, acquisitions, and venture funding, and we have a record number of birth of unicorns and big IPOs, as [discussed in our recent report](#).



## ROBO: ROBOTICS & AUTOMATION INDEX

Robotics and automation stocks marginally outperformed global equities in Q3, with the [ROBO Global Robotics & Automation Index \(ROBO\)](#) declining 0.7% in the quarter, compared to a 1% drop for the MSCI AC World Index. Seven of the 11 subsectors registered gains, led by Business Process Automation (+9%), Integration (+8%), and Computing & AI (+4%), while 3D Printing (-22%), Autonomous Systems (-17%), and Actuation (-11%) lagged.

By region, Europe (+5%) and Japan (+2%) outperformed, with strong contributions from [Blue Prism](#), [Omron](#), [Kardex](#), and [Jenoptik](#), while US (-4%) and Greater China (-4%) underperformed, with pullbacks in [3D Systems](#), [IPG Photonics](#), [Luminar](#), and [Airtac](#).



Rebased 100 on September 30, 2016; Total Return through September 30, 2021; Periods greater than 1 year have been annualized

Inception Date: Aug. 2, 2013

ROBO Subsector (Total Return)	Q3 2021	Past 12 mo.
3D Printing	-22.2%	97.2%
Actuation	-11.1%	9.7%
Autonomous Systems	-17.1%	18.8%
Business Process Automation	9.2%	25.0%
Computing & AI	3.6%	53.0%
Food & Agriculture	1.5%	63.8%
Healthcare	0.7%	33.9%
Integration	8.5%	40.6%
Logistics Automation	0.9%	31.1%
Manufacturing & Industrial Automation	2.6%	43.7%
Sensing	-1.6%	15.5%
<b>INDEX TOTAL</b>	<b>-0.7%</b>	<b>35.8%</b>

% Weight by Subsector



<b>Application</b>	<b>58%</b>
Manufacturing & Industrial	17%
Healthcare	12%
Logistics Automation	12%
Business Process Automation	6%
Food & Agriculture	5%
3D Printing	4%
Autonomous Systems	2%
<b>Technologies</b>	<b>42%</b>
Computing & AI	14%
Actuation	12%
Sensing	9%
Integration	7%

For the first time since 2017, we are seeing bottlenecks in parts of the robotics and automation supply chain, with lead times and wait lists extending for new orders. This is particularly true in logistics and warehouse automation, where demand for equipment and software is supported by the boom in e-commerce and supply chain disruptions. Logistics & Warehouse Automation accounts for approximately 12% of the ROBO index by weight. [GXO Logistics](#), a leading pure-play contract logistics company, was included as a new member at the September rebalance, following its spinoff from XPO.

We believe that the cyclical recovery in industrial automation (just under 40% of the index by weight) remains in full swing, as we enter a fifth quarter of improvements in what historically has been a series of 10 to 14 quarters of expansion. We consider it a high probability that factory automation earnings will reach a new high next year.

M&A remained in focus in Q3. [Hollysys Automation Technologies](#), the Chinese provider of automation control system solutions, received a new offer to go private at \$23/share or \$1.41 billion. [Blue Prism](#), a leader in robotic process automation based in the UK, agreed to be acquired by Vista Funds for GBP1.1 billion or 6.5x its expected revenue in the year to October 2021. Finally, [Brooks Automation](#) announced it would sell its semiconductor automation business to Thomas H. Lee Partners for \$3 billion in cash or 4.9x its revenue in the 12 months to June 2021. These offers represent large premiums to recent share prices and sent the two stocks near the top of the performance rankings for the quarter.

ROBO is trading on a forward P/E of 29.8x, a 20% premium to its 25.8x five-year average. However, earnings of best-in-class robotics and automation companies remain on a remarkable upward trajectory. Q2 EPS exceeded expectations by 12% at the median, rising by a record 68% YoY, the strongest growth since the inception of the index in 2013. While the hurdle was low after a 19% decline a year ago, we expect EPS to grow by more than 80% YoY in Q3, off a higher base, and 42% YoY for the full year 2021.

### Forward Price/Earnings

Long Term Average = 25.8



Source: ROBO Global®, CapitalIQ. Data as of 2021-09-30.  
Calculation Method: Index Aggregate, NTM



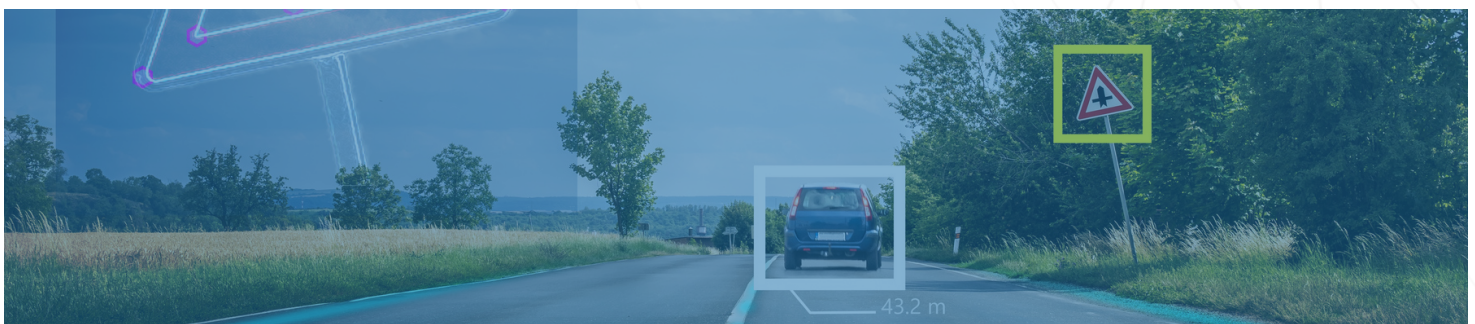
## MOVERS & SHAKERS

**Ambarella (+46%)**, a leader in video processing semiconductors, continues to demonstrate it is rapidly morphing into an AI company. Ambarella's computer vision capabilities are gaining significant traction with major players in video security, where adoption remains low and prices attractive, as well as in automotive, including recent wins with Motional (Hyundai/Aptiv JV) and commercial players. The company reported much-improved operating margins in the 20% range after stalling around 10% in the prior 12 months, suggesting it is likely to remain competitive against larger peers. We believe Ambarella is a highly attractive acquisition target.

**Hollysys Automation Technologies Ltd (+39%)**, the Chinese provider of automation control system solutions, received a new, higher offer to go private at \$23/share or a total of \$1.41 billion. The offer came from a consortium including the founder of the company who retired in 2013, which also attracted the co-COOs of the company. The offer largely exceeds the \$15.47 lowball offer from a consortium comprising Mr. Baiqing Shao, Ace Lead Profits Limited, and CPE Funds Management Limited, announced in December 2020.

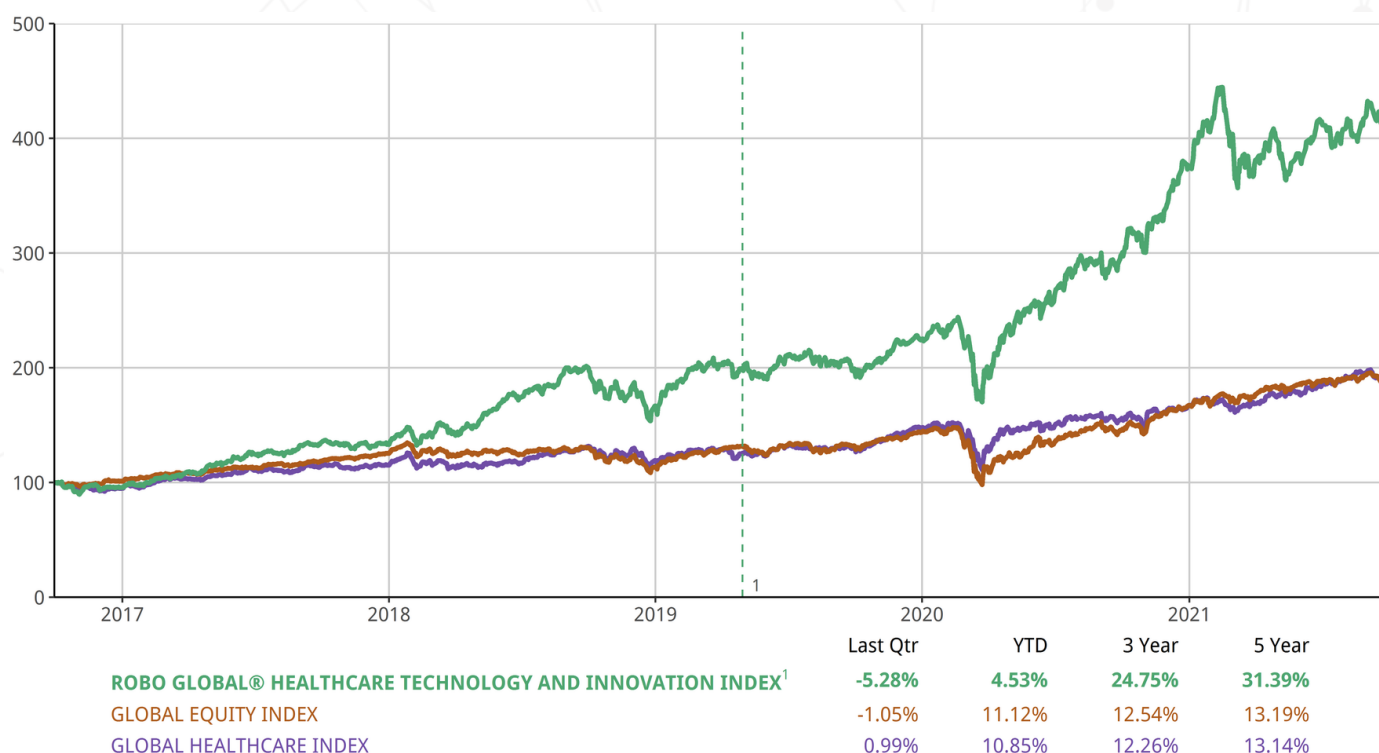
**Estun Automation (-44%)**, the Chinese provider of controlling parts for intelligent equipment, was caught in the tech sell-off in Chinese equities. Estun offers CNC systems, AC servo and motion control systems, industrial robots, and smart manufacturing systems. The company is emerging as a dominant force in the China market with the best market share gains among domestic players. We see Estun as the Chinese player most likely to challenge global competitors' market share in China over time, driven by its product quality, focus, and best in-house componentry capabilities. We believe it can grow revenue at a 30% CAGR for the next 3 years and above 15% for the next 5 years.

**3D Systems (-31%)**, a leading provider of 3D content-to-print solutions and member of both the ROBO and HTEC indices, pulled back in Q3 after an extremely strong 281% gain in the first half of the year. The company has made significant progress with its restructuring plan announced in the summer of 2020, as reflected in accelerated top-line growth and rapidly strengthening operating margins, the sale of its Cimatron and Gibbs CAM software businesses, and most recently the \$180 million acquisition of Oqton, a software company that is a leader in the creation of a new breed of intelligent, cloud-based manufacturing operating system (MOS) platform. With the addition of Oqton, 3D Systems expects the run rate revenue from software to exceed \$100 million by the end of 2025.



# HTEC: HEALTHCARE TECHNOLOGY & INNOVATION INDEX

The [ROBO Global Healthcare Technology and Innovation Index \(ticker: HTEC\)](#) posted a -5.3% loss in Q3, underperforming the S&P Global Healthcare index (+1.0%) and the MSCI AC World Index (-1.0%). In terms of valuation, HTEC trades on a forward 12-month EV/sales ratio of 6.4x, down from 7.1x in the previous quarter.



Rebased 100 on September 30, 2016; Total Return through September 30, 2021; Periods greater than 1 year have been annualized  
1: Includes back-tested data prior to April 30, 2019

Inception Date: Apr. 30, 2019

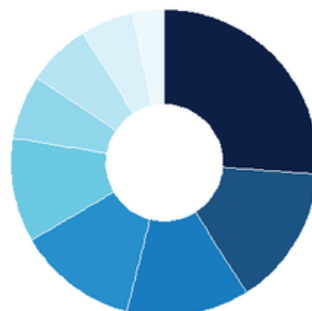
Three of the nine HTEC subsectors delivered positive returns: Process Automation (+10.6%), Diagnostics (+4.9%), and Robotics (+4.0%). [Catalent](#), a global contract development and manufacturing organization, led Process Automation, gaining 23.1% after reporting a strong quarter. Strong performance was driven by 66% growth in Catalent's biologics division, which includes COVID-19 projects. Catalent is a partner of [Moderna](#) and J&J and played a role in the manufacturing of these companies' COVID vaccines. [Intuitive Surgical](#), the global market leader of surgical robotic systems, returned 8.1% last quarter. The company reported better than expected Q2 results. System revenue grew 68% YoY driven by the US, China, and Japan. Instruments & Accessories revenue grew 73% YoY driven by strong procedure trends in US and China as procedure volumes return to pre-COVID levels.

Telehealth and Regenerative Medicine lagged with -30.6% and -17.0% returns, respectively. During the quarter, the Chinese government announced its intention to review the regulation of healthcare technology platforms, raising uncertainty regarding the future profitability of companies in this space, and driving a sell-off of HTEC members [Ping An Healthcare and Technology Co.](#) (-47.8%), [Alibaba Health](#) (-35.1%), and [JD Health](#) (-32.7%). These three companies comprise 3.3% of the index.



HTEC Subsector (Total Return)	Q3 2021	Past 12 mo.
Data Analytics	-16.2%	16.5%
Diagnostics	4.9%	18.4%
Genomics	-11.4%	52.2%
Medical Instruments	-8.2%	34.8%
Precision Medicine	-3.5%	29.1%
Process Automation	10.6%	59.5%
Regenerative Medicine	-17.0%	15.2%
Robotics	4.0%	55.8%
Telehealth	-30.6%	-51.3%
<b>INDEX TOTAL</b>	<b>-5.3%</b>	<b>31.1%</b>

% Weight by Subsector



Medical Instruments	26%
Diagnostics	15%
Precision Medicine	13%
Process Automation	13%
Genomics	11%
Telehealth	7%
Data Analytics	7%
Robotics	6%
Regenerative Medicine	3%

## MOVERS & SHAKERS

**Moderna (+64%)**, a global market leader in mRNA therapeutics, reported a strong quarter again due to COVID-19 vaccine sales. The company is also progressing its pipeline with other vaccines, including flu, HIV, RSV, and CMV.

**Dexcom (+28%)**, the maker of the most accurate continuous glucose monitor (CGM), reported Q2 sales growth of 32% YoY, handily beating expectations. The company also filed for the CE mark approval of its new G7 CGM, and expects approval by year end. G7 is expected to be the size of a nickel, which is 60% smaller than its predecessor and more discreet when worn.

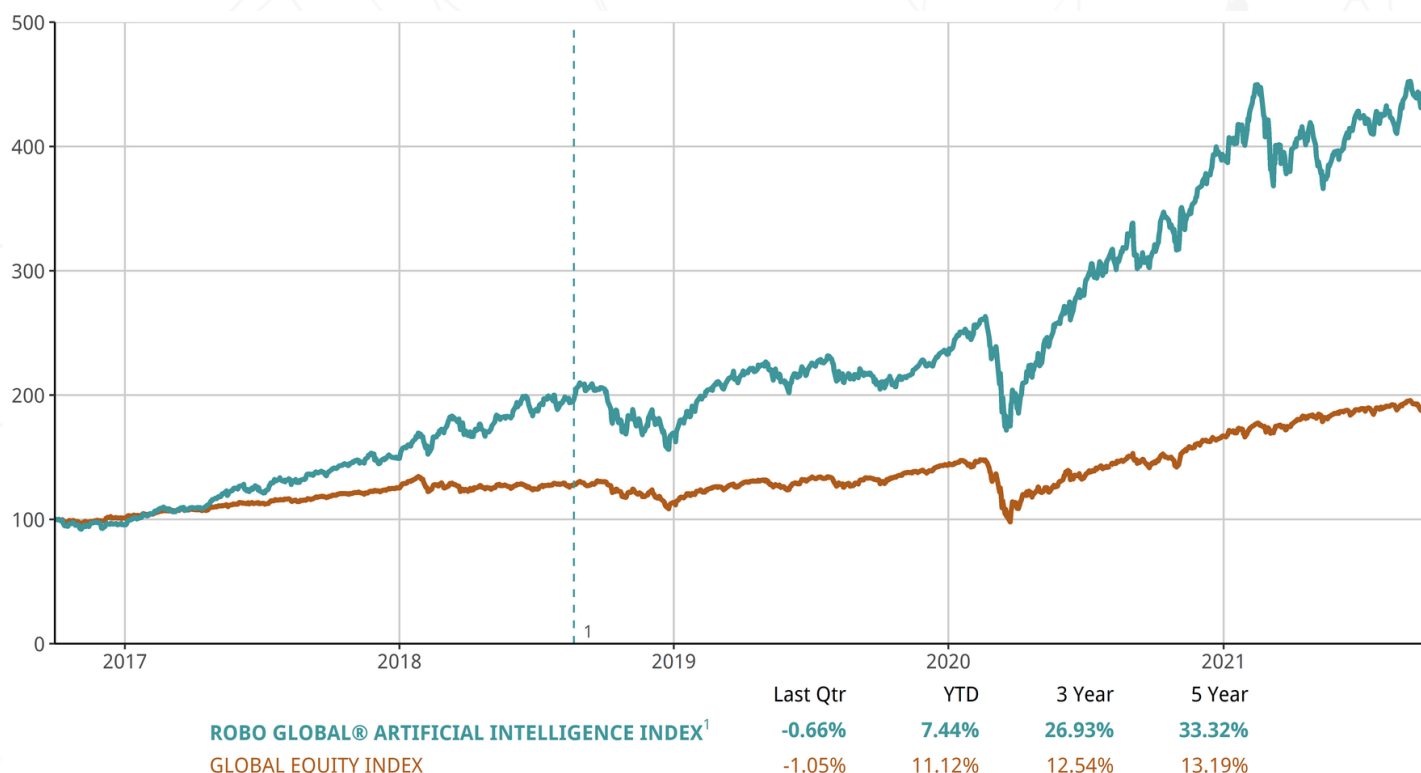
**Ping An Healthcare & Technology (-48%)**, the telehealth market leader in China, announced its intention to partner with its parent company and cross-sell with its insurance products. This news was received with skepticism, along with the uncertainty of China's regulatory reform that could impact this industry. That said, we believe that Ping An Healthcare & Technology is well positioned to benefit from the strong growth in the China telehealth market.

**Tabula Rasa (-48%)** is a pharmacy and software services provider that uses proprietary software to help patients manage complex medication regimens. The company faced some challenges this quarter, including the termination of a U.S. government (CMS) contract. We believe the sell-off is overdone, with a strong pipeline of new contracts that are expected to go live in 2022 that should reaccelerate top-line growth.



## THNQ: ARTIFICIAL INTELLIGENCE INDEX

The [ROBO Global Artificial Intelligence Index \(THNQ\)](#) declined -0.7% in 3Q, slightly outperforming global market indices. After a pullback in 1Q and subsequently strong Q2, we continue to see strong top-line revenue and EPS growth, with macro headwinds facing off with record current and projected demand across AI infrastructure and applications.



Rebased 100 on September 30, 2016; Total Return through September 30, 2021; Periods greater than 1 year have been annualized  
1: Includes back-tested data prior to August 21, 2018

Inception Date: Aug. 31, 2018

Six of the 11 subsectors posted positive returns, with Network & Security (+10%), Consulting Services (+9%), and Business Process (+3%) leading the way, while Cloud Providers (-9%), Healthcare (-8%), and Big Data (-5%) underperformed.

Network and Security subsectors outperformed for the second consecutive quarter, driven by increasing need for next-generation security solutions spurred by accelerated adoption of cloud infrastructure. Index members such as [Palo Alto Networks](#) (+29%) and [Rapid7](#) (+19%) are experiencing multiple secular trends as well as new product cycles as the need to protect against malicious attacks continues to increase at a rapid pace. [Pure Storage](#) (+29%), a leading provider of data storage solutions, continues to benefit from the increased spending around AI-powered architecture and has seen momentum around their next generation FlashArray solutions.

Meanwhile, Cloud Provider subsector experienced mixed results, as shares of [Alibaba](#) (-34%) and [Tencent](#) (-21%) remained under pressure driven by political and regulatory risks in China increasing sharply throughout the quarter. Valuations are near a 2-year low, and we anticipate recovery by

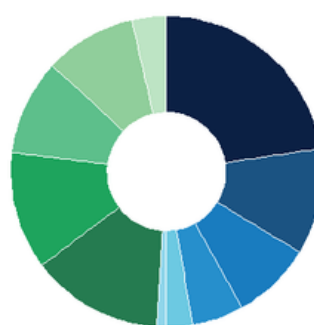


the Chinese cloud providers over the coming quarters as the overhang on these companies are mitigated. Index member [Baidu](#) (-25%), trading at less than 1.5x forward EV/sales, is the biggest player in the AI cloud market in China, with promising technologies around AI-powered e-commerce and autonomous solutions. Baidu is a leader in autonomous driving technologies, and countries like China are starting to fully support these AI-powered technologies and setting standards for automakers. On the positive front, index members such as [Cloudflare](#) rose 6.5% during the quarter despite the pullback in high-growth tech companies. Cloudflare provides cloud network services as well as security solutions to small to large enterprise customers. Its innovative solutions with a strong go-to-market approach has allowed them to grow revenues by +50% YoY.

We also saw continued M&A activity – with the takeout of [Cornerstone on Demand](#), a cloud-based talent management solutions provider, by Clearlake Capital for \$3.8 billion and an accepted offer by [Blue Prism](#) from Vista Partners for \$1.5 billion.

THNQ Subsector (Total Return)	Q3 2021	Past 12 mo.
Big Data/Analytics	-5.1%	9.4%
Business Process	3.1%	25.9%
Cloud Providers	-8.6%	42.4%
Cognitive Computing	1.2%	37.0%
Consulting Services	8.8%	41.0%
Consumer	-3.2%	4.1%
Ecommerce	-4.0%	25.0%
Factory Automation	2.5%	34.8%
Healthcare	-8.2%	51.3%
Network & Security	9.9%	65.5%
Semiconductor	0.6%	59.6%
<b>INDEX TOTAL</b>	<b>-0.7%</b>	<b>33.4%</b>

% Weight by Subsector



<b>Applications &amp; Services</b>	<b>51%</b>
Business Process	23%
Ecommerce	11%
Consumer	8%
Healthcare	5%
Factory Automation	3%
Consulting Services	1%
<b>Infrastructure</b>	<b>49%</b>
Semiconductor	14%
Big Data/Analytics	12%
Network & Security	10%
Cloud Providers	9%
Cognitive Computing	4%

## MOVERS & SHAKERS

[Atlassian](#) (+52%), a developer of collaborative software tools such as Confluence, Jira, and Trello, has been leading the way for the digital transformation of thousands of companies and AI/ML teams. They continue to expand, with over 200,000 customers, and gain market share, with over 178 large enterprise customers – up 40% YoY. This past quarter, Atlassian shares surged after delivering strong earnings upside by 30%.

[Blue Prism](#) (+38%), one of the enterprise market leaders in robotic process automation (RPA), offers a digital workforce platform, intelligent automation skills, chatbots, and APIs to integrate and perform productivity applications. Blue Prism received a GBP1.1 billion or \$1.5 billion USD buyout offer from Vista Equity Partners, representing 6.5x expected revenue for the year ending October 2021. The stock had been trading at a fairly large discount to its peer group after failing to grow as fast as its key competitors UiPath and Automation Anywhere.

**Lemonade (-38%)**, a leader in insurtech which utilizes AI to offer insurance at lower cost through automation and improved risk management, launched its car insurance solution, adding to their home, life, and pet insurance products. Lemonade continues to disrupt the insurance industry with its strong positioning and adoption by millennials and Gen-Z, many first-time consumers of insurance products, because of its easy-to-use software application.

**Wix (-32%)**, is a market leader in AI powered website design and development solutions. It offers hosting, content optimization and payment tools for their small to medium enterprise clients. After a surge in revenue growth of 30% in 2020 driven by the pandemic as customers raced to get their business an online presence, Wix saw sales cycle normalize in 2021 with the economy opening up. Recently, the company has been ramping up its spending in technology differentiation and new offerings for their e-commerce and payment platform which should support their revenue growth of 25% over the coming years.



## ROBO

### ROBO Global Robotics & Automation Index

[roboglobal.com/ROBO](http://roboglobal.com/ROBO)

SUBSECTOR	EXPOSURE
<b>Application</b>	<b>57.93%</b>
3D Printing	3.80%
Autonomous Systems	1.70%
Business Process Automation	6.47%
Food & Agriculture	5.42%
Healthcare	12.14%
Logistics Automation	11.82%
Manufacturing & Industrial Automation	16.59%
<b>Technologies</b>	<b>42.07%</b>
Actuation	11.99%
Computing & AI	13.69%
Integration	6.97%
Sensing	9.42%

TOP 10 HOLDINGS	WEIGHT
BROOKS AUTOMATION INC	2.11%
IRHYTHM TECHNOLOGIES INC	1.87%
IROBOT CORP	1.70%
KARDEX HOLDING AG	1.69%
INTUITIVE SURGICAL INC	1.68%
FANUC CORP	1.61%
KEYENCE CORP	1.59%
AIRTAC INTERNATIONAL GROUP	1.58%
DAIFUKU CO LTD	1.56%
IPG PHOTONICS CORP	1.55%
<b>TOTAL</b>	<b>16.92%</b>

## HTEC

### ROBO Global Healthcare Technology & Innovation Index

[roboglobal.com/HTEC](http://roboglobal.com/HTEC)

SUBSECTOR	EXPOSURE
Data Analytics	6.73%
Diagnostics	14.84%
Genomics	10.98%
Medical Instruments	26.18%
Precision Medicine	12.93%
Process Automation	12.67%
Regenerative Medicine	3.36%
Robotics	5.56%
Telehealth	6.76%

TOP 10 HOLDINGS	WEIGHT
IRHYTHM TECHNOLOGIES INC	1.86%
DEXCOM INC	1.58%
THERMO FISHER SCIENTIFIC INC	1.57%
BOSTON SCIENTIFIC CORP	1.51%
INSULENT CORP	1.47%
INTUITIVE SURGICAL CORP	1.45%
PENUMBRA INC	1.44%
CHARLES RIVER LABRATORIES INTERNATIONAL INC	1.43%
AXOGEN INC	1.42%
VERACYTE INC	1.42%
<b>TOTAL</b>	<b>15.15%</b>

## THNQ

### ROBO Global Artificial Intelligence Index

[roboglobal.com/THNQ](http://roboglobal.com/THNQ)

SUBSECTOR	EXPOSURE
<b>Applications &amp; Services</b>	<b>51.01%</b>
Business Process	22.64%
Consulting Services	0.94%
Consumer	8.28%
Ecommerce	11.01%
Factory Automation	2.79%
Healthcare	5.35%
<b>Infrastructure</b>	<b>48.99%</b>
Big Data/Analytics	12.24%
Cloud Providers	9.49%
Cognitive Computing	3.58%
Network & Security	9.95%
Semiconductor	13.72%

TOP 10 HOLDINGS	WEIGHT
ANALOG DEVICES INC	1.82%
ATLASSIAN CORP PLC	1.80%
INTERNATIONAL BUSINESS MACHINES CORP	1.76%
SALESFORCE.COM INC	1.76%
ALTERYX INC	1.70%
AMAZON.COM INC	1.67%
TENCENT HOLDINGS LTD	1.66%
BAIDU INC	1.66%
IROBOT CORP	1.66%
MICROSOFT CORP	1.65%
<b>TOTAL</b>	<b>17.13%</b>

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