



## China as a Major Robotics Growth Engine

*An Investor's Introduction to Robotics & Automation*

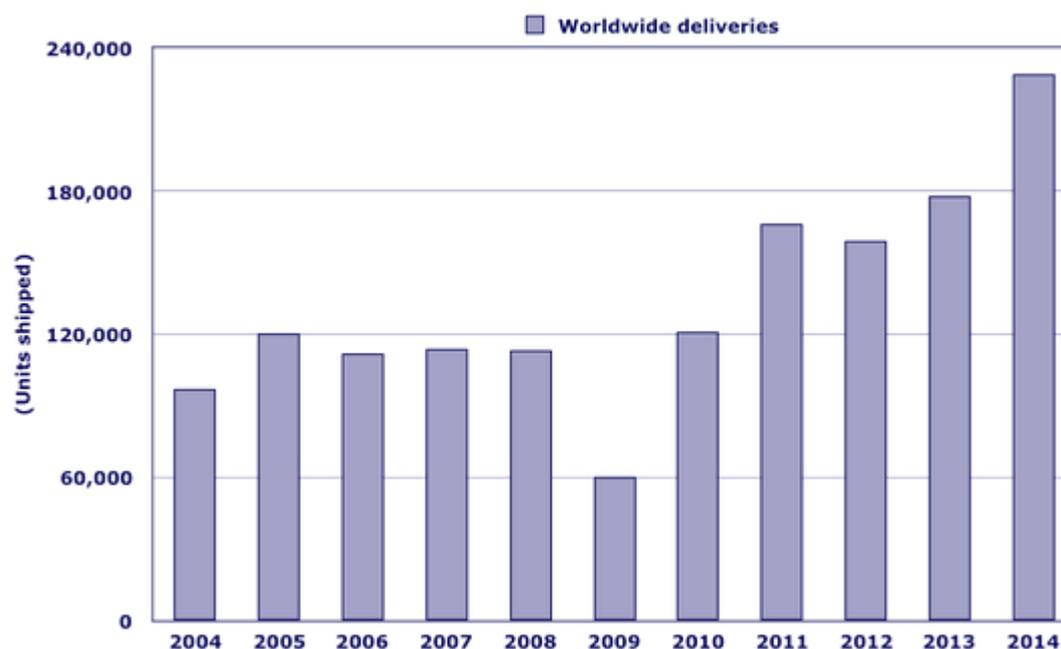


### Henrik Christensen

Director of UC San Diego Contextual Robotics Institute  
Strategic Advisor to ROBO Global  
September 2016

Over the last 4 years we have seen solid growth in robot sales worldwide. The biggest growth has been in China. Overall 70% of all robots are sold in China, Japan, Germany, South Korea and USA. 25% of all robots are sold in China. The growth does not seem to stop anytime soon. Why is that?

Over the last few years we have seen major growth also in USA, South Korea and Japan. The overall sales figures from the IFR World Robotics are shown below:

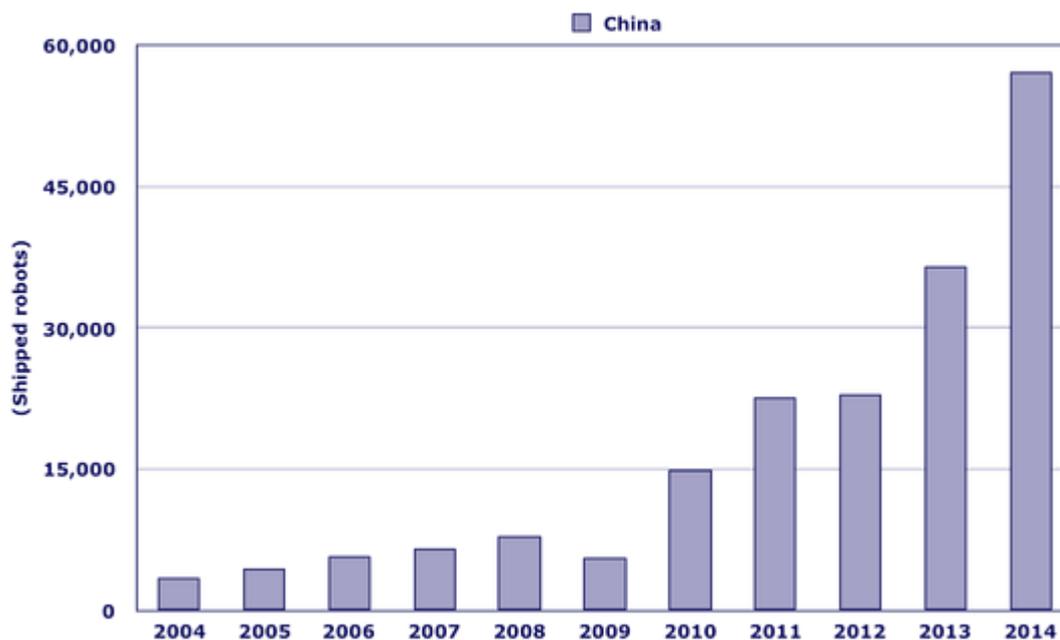


Worldwide robot deliveries over the last 10 years. The growth since 2009 is dramatic.



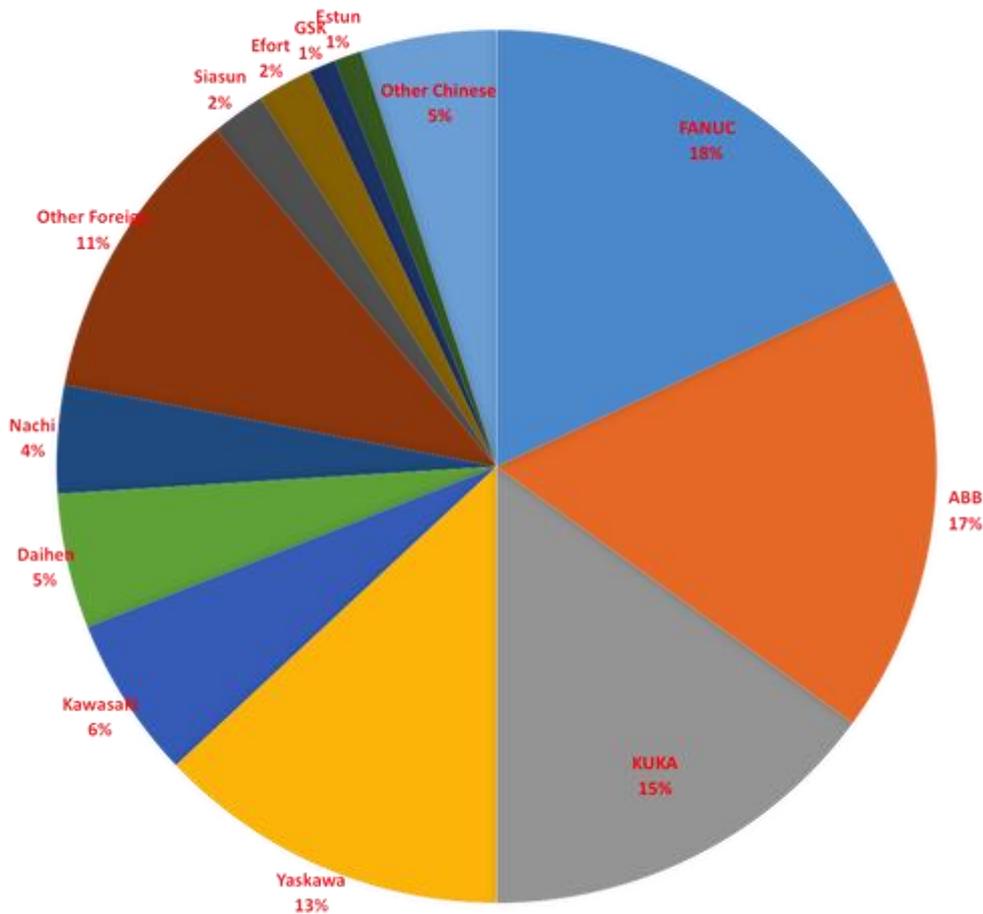
The CAGR since 2009 has been 17% and it is interesting that more than half of all robots sold are delivered to factories in Asia. The total value of the robot industrial market 2014 was \$10B, and if integration is included the total value is close to \$30B. This very much matches the general rule for cost breakdown – ~30% of an installed system is the actual robot, ~20% of the cost is related to other hardware such as the end-effector, fencing, and conveyors.

Sales in China has been particularly impressive with 50%+ annual growth that last 3-4 years. The growth has been very much motivated by a need to retain manufacturing in China. The hourly wages for manufacturing workers has gone up 350% over the last 10 years.



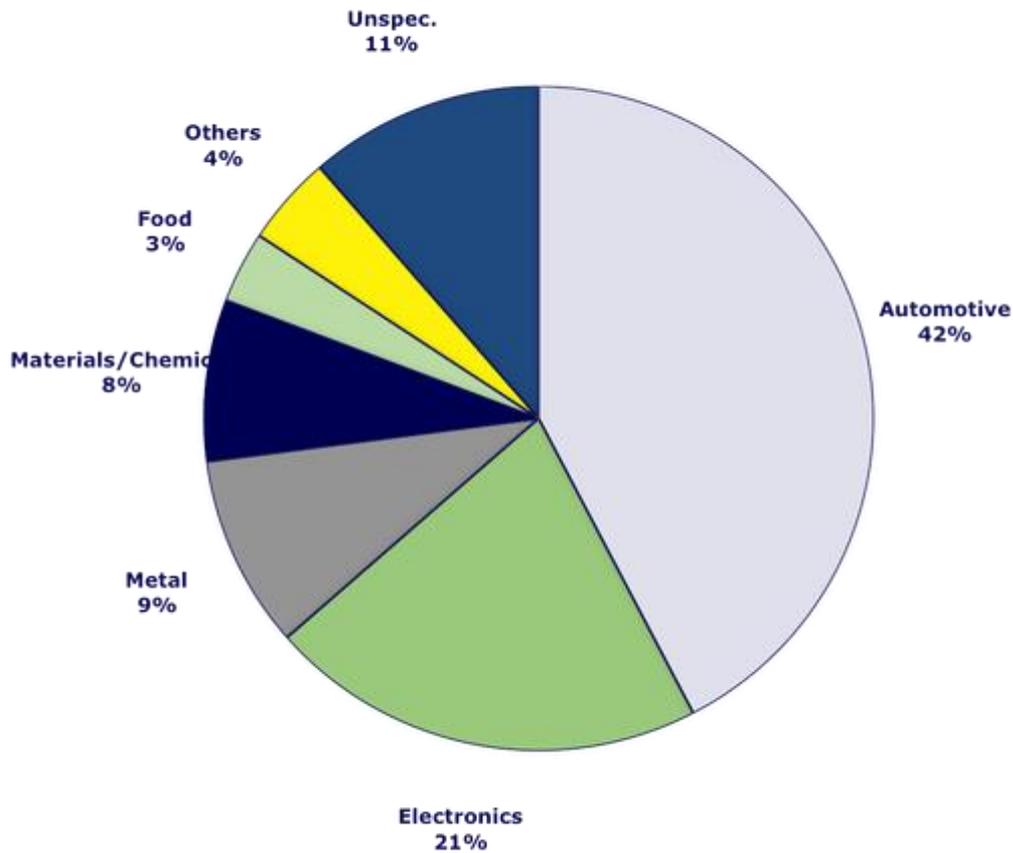
80% of the robots delivered were manufacturing by foreign companies or joint ventures in China. These companies experienced 49% year-year growth 2014-2015. The remaining 20% of robots delivered were made by Chinese companies. The annual growth (2014-2015) was 78% which is most impressive.

The division of market shares is shown below (for 2014). As expected the biggest company was FANUC, but closely followed by ABB, KUKA and Yaskawa. The biggest Chinese company was Siasun, that is emerging as the leader from the Chinese companies.

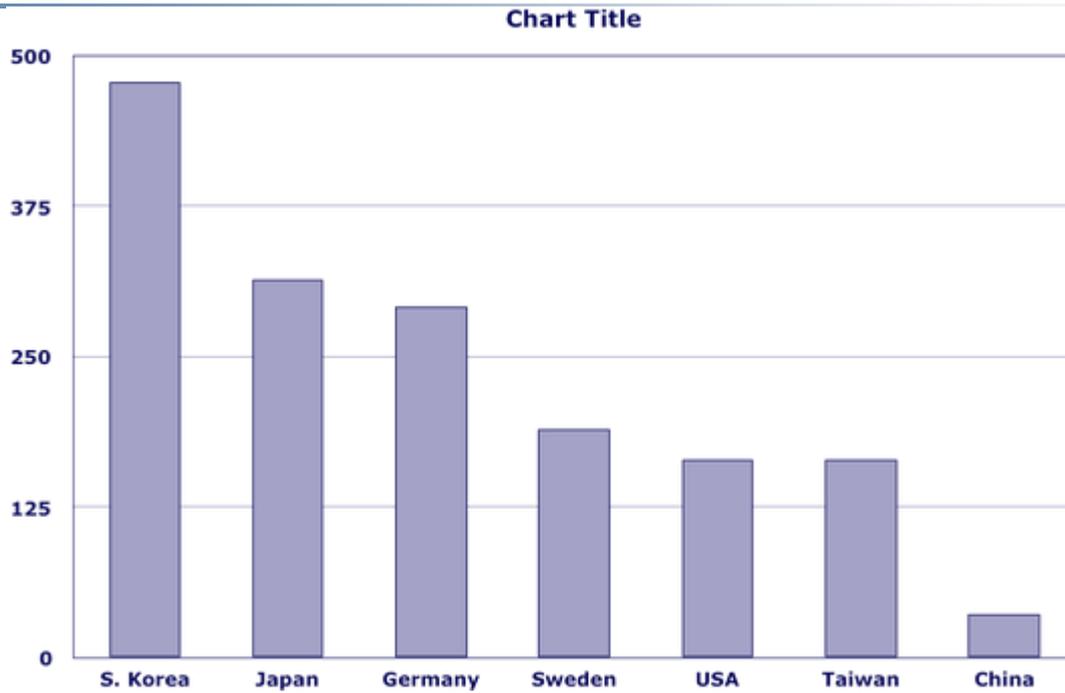


Already today more than 30% of all cars manufactured worldwide are produced in China. However, very few of these are sold outside China. First of all there is a major home market and in addition the industry is challenged by inconsistent quality.

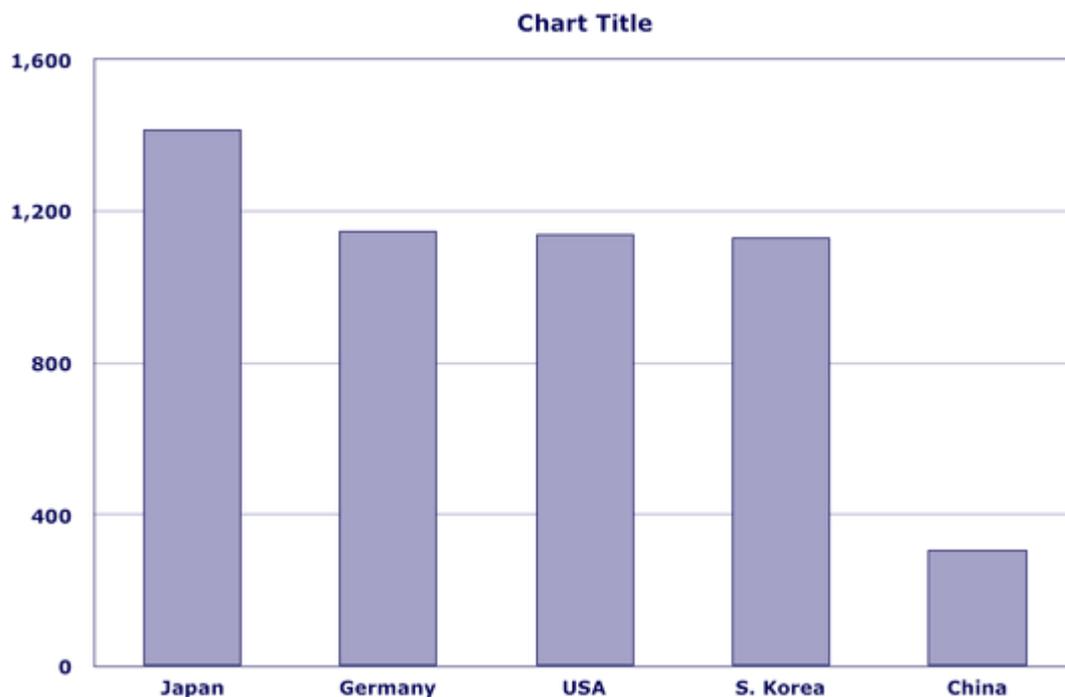
For robotics in general the main application area is still automotive, which takes up close to 42% of all robots sold. Electronics is number 2 and metal handling is 3rd. The fact that China has emerged as the largest producer of cars and also as a country with a need for automation to remain competitive points to a clear need for major growth in robot sales.



Often the maturity of a market is measured by the number of robots deployed for every 10,000 workers in an industry. Korea has emerged as a leader with almost 500 robots deployed / 10,000 workers. Japan is second and Germany third. The world average for manufacturing countries is 87 robots / 10,000 workers. For 2014 China had only ~40 robots / 10,000 workers. Consequently China would have to double its robot inventory to even have average utilization of robots.



If we zoom in on the automotive industry, then the average penetration is 1 robot per 10 workers. Japan is the leader with use of lean manufacturing and a high degree of automation. Countries such as Germany, USA and S. Korea are all close to the expected 1/10. China on the other hand is closer to 1/30 as shown below.

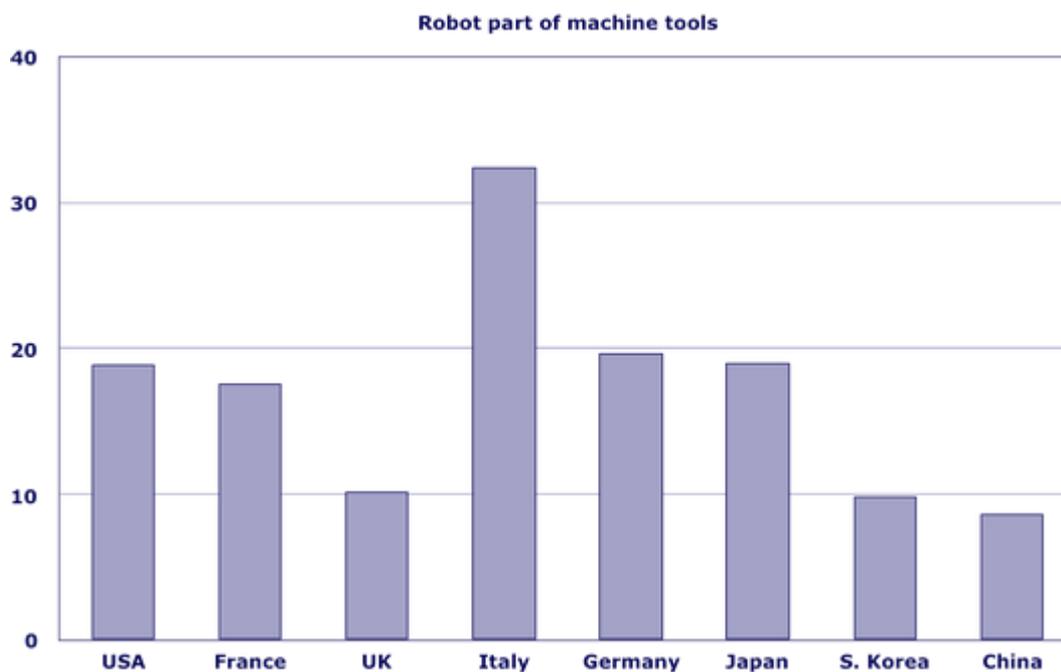


Consequently, one would expect to see major growth for the automotive market too. Salaries are lower in China, but the real driver is really quality of the final product. The big



driver is consistent quality to ensure that product manufactured at any time of the day or any day of the week have the same quality.

Frequently, the improvement in quality has been achieved through use of machine tools. They have a high stiffness and can generate high accuracy products with a high quality. One challenge for a factory that is laid out using machine tools is limited flexibility. It is difficult to change a factory line with a series of machine tools. In the automotive industry it is common to change the model at least annually and even with a common platform programming can be a major challenge. Consequently, we have seen an increased interest in utilization of robots as a replacement for machine tools. It is easier to change the end-effectors and industrial robots are designed for easy programming. Consequently, we are seeing a shift from machine tools to industrial robots. The general statistics for machine tools vs robots is shown below.



Again China is only at half in its utilization compares to major markets such as USA, Japan and Germany. Consequently, there is no doubt we will continue to see major growth in China and slowly we will also see a strong presence of Chinese companies. In some cases, these companies will emerge directly from China and in some cases these companies will emerge from foreign acquisitions such as the Midea acquisition of the majority share in KUKA AG.

Overall the robotics industry is expected to continue to see solid (~15-20% annual growth) but the major growth driver will without doubt continue to be China for the foreseeable future.



Note: Many of the numbers in the post were adopted from the IFR World Robotics Publication.



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## Powering the ROBOlution



## *An Investor's Introduction to Robotics & Automation*

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### **Louis-Vincent Gave**

CEO at Gavekal & Strategic Advisor to ROBO Global

June 2016



For those who have closely followed GK Research, you will know that we have shared our opinions for several years on the coming rise and impact of Robotics & Automation on the world economy. Robotics and automation has quickly progressed from a thematic industrial focused story into a global growth opportunity. It is no surprise that amongst the key themes at the Davos World Economic Forum this year was automation. Additionally, robotics is at the core of the EU's Horizon 2020 project and was featured in the President of the United States and the Council of Economic Advisors to Congress in a 435-page report in February for its significance in global economic importance.

We are at a convergence where falling price, technology improvements, high complexity and mission critical applications are meeting high labor costs and the need for productivity. This environment along with increasing global penetration rates are creating a self-propelling transformation for the industry. While always difficult to call perfect inflection points, the investment case for robotics and automation grows more and more obvious with each passing day. For investors, robotics and automation, in our opinion, is embarking on the same ubiquitous journey as the Internet, and is on track to be as disruptive as computers and smartphones.

As individuals and investors, we are experiencing a significant period of technological advancement and a big investment opportunity in robotics. These technologic developments are enabling robots to perform increasingly sophisticated and delicate knowledge-based work for a fraction of the cost. This widens their use to an incredible array of products and services across business, service, and consumer sectors globally.



### **THE FUTURE IS NOW AND SO IS AN INDEX TO TRACK THE TREND**

Robots are here and are already performing a number of diverse applications including: elderly care, autonomous driving, improving farming productivity, search, rescue, surveillance, 3D printing spare engine parts, exoskeletons that help injured or disabled



people to walk, and performing surgical procedures. These are all areas of daily life where robotics and automation seek to improve efficiency, safety, quality of life, and sustainability at a reduced cost.

For investors wishing to participate in the expected outsized growth in robotics and automation, ROBO Global is the first index created to measure and capture the growth. ROBO Global is a tactical exposure that is multi-cap, global and broad exposure to the diverse ecosystem of core and enabling robotic and automation technologies. The two-tier, equal weighting scheme for index member is designed to capture the growth opportunity while minimizing company specific risk and overall volatility.



## INDEX SECTOR SPOTLIGHTS

One industry that will be transformed by robotics and automation, ultimately for the betterment of society, is healthcare. This sub-sector of robotics is already well established in terms of public companies including ROBO index companies Varian Medical Systems, Accuray and Cyberdyne. Intuitive Surgical dominates the surgical market with the Da Vinci Surgical Robot, with over 3,000 global installations to date. Healthcare is a critical field that will demand an increase of workload as the global population continues to reach, and pass, retirement.

3D printing, UAVs, and collaborative robots are also interesting and rapid growing robotics products. We are seeing strong capital inflows and increased M&A activity. Interesting

players include Arcam, SLM Solutions, DJI, KUKA, ABB, and Universal Robots who are all positioning for a share in these multi-billion dollar markets.



The cornerstone of robotics and automation continues to be industrial manufacturing. The large players being KUKA, Fanuc, ABB and Yaskawa are expanding into new industries ranging from electronics to food processing and warehouse logistics. There is no question that automation optimizes resources and productivity. Global manufacturing labor costs account for \$6 trillion annually according to McKinsey and the further adoption of automation technologies will represent considerable savings for years to come.



## **GROWING IMPACT ON THE GLOBAL ECONOMY AND LABOR**

The replacement of low value labor with machines is inevitable. Global competitive forces remain fierce and work can be relocated anywhere. As waves of technology innovation displace workers, productivity increases, wealth increases and more jobs are created. Most economists agree that robotics increases productivity, but the unknown factor is where the wealth and job growth will occur.

This question brings us to the hot political topic of the day - minimum wage. Indeed, at this stage, all presidential candidates in the current US election seem keen on pushing the cost of labor higher.

As the chart below from Goldman Sachs illustrates, wages in the US are rising in a number of states:

**Exhibit 2: 14 states have increased their minimum wage over the last 6 months**  
State minimum wage (\$); % change in minimum wage during most recent increase

Source: Economic Policy Institute, Goldman Sachs Global Investment Research.

This new trend, combined with the various proposals for a higher mandated minimum wage across the country, does beg the question of how most entrepreneurs and businessmen will respond to the promise of a higher wage bill? As we see it there are three options:

**Option 1:** pay the higher wage bill and take the hit on profits

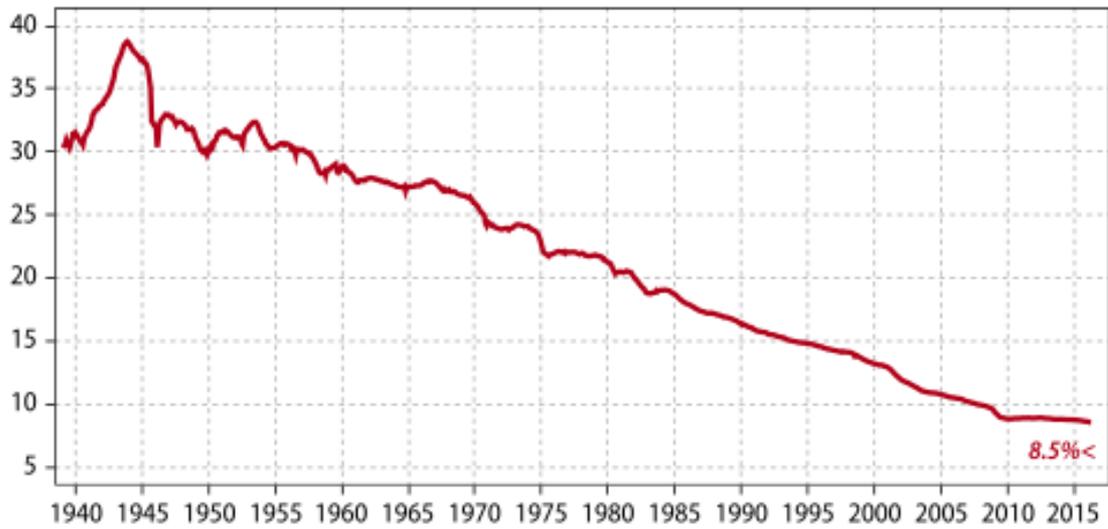
**Option 2:** outsource production to the 'cheap again' near destinations (Canada & Mexico)

**Option 3:** replace labor with capital

Of these three options, the first seems by far the least likely to happen. The second may also be a stretch, even if the -23% drop in the CAD, and -40% drop in the Mexican Peso over the past two years, would imply that American businessman would do well to look across the US borders for cheaper workers, even without the threat of a higher minimum wage. Indeed, with manufacturing employment in the US now down to below 8.5% of overall employment, one might question how much manufacturing outsourcing is left in the US economy? After all, it is unlikely that the US moved to having 0% of jobs in domestic manufacturing (if only to produce America's numerous bombs, warplanes, missiles and tanks...?)



### Manufacturing employment as a % total employment in USA



Gavekal Data/Macrobond

Which brings us to the third possibility, namely that the combination of a strong US\$ and a politically mandated higher minimum wage leads to a new wave of automation which replaces the low-value added jobs of fast-food workers, hotel clerks, taxi drivers, and the like.

Is this by far not one of the most obvious macro-trends of the next five years? And, if so, **how is your portfolio exposed to it?**



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# Robotics in Market Research

*62 Reports Covering the Robotics & Automation Industry*



## Frank Tobe

Co-founder of ROBO Global, Editor & Publisher of The Robot Report  
July 2016

**The number of research reports studying the robotics industry is growing exponentially. To date in 2016 there have been 109 on subjects ranging from overly broad to very drilled-down views of the industry. Prices range from \$800 to \$6,500.**

Below are short profiles of 62 of those reports; **the other 47 can be seen here**. Many of the reports duplicate the coverage of others and frequently differ in their forecasts about the future. Some of the reports are marginally useful; others are full of valuable information. Bottom line, almost all of the reports are forecasting positive double-digit growth for most segments of the robotics industry.

Consistent with previous reports, and with **The Robot Report**'s monthly fundings, acquisitions and IPOs recaps, the drone segment has the most activity - 35 of the 109. The official industry reports, which tabulate the results from all the robot associations around the globe, produced by the **International Federation of Robotics**, appear at the bottom.

## **INDUSTRIAL ROBOTICS (9)**

**Frost & Sullivan**, in a May 2016, 95-page \$4,950 report, analyzed the top 10 technologies in advanced manufacturing and automation. Their list includes: additive manufacturing, digital manufacturing, collaborative robotics, agile robots, exoskeletons, micro manufacturing, multi-material joining, composites manufacturing, UUVs, and Maglev.

- **Global industrial robotics market**, February 2016, Markets and Markets, \$4,650  
The global industrial robotics market is expected to reach \$79.58 billion by 2022, growing at a CAGR of 11.92% between 2016 and 2022.
- **European industrial robotics market**, May 2016, 55 pages, TechNavio, \$2,500  
The analysts forecast the European industrial robotics market to grow at a CAGR of 8.42% during the period 2016-2020.



- **Industrial robotics market in APAC**, May 2016, 70 pages, TechNavio, \$2,500  
Forecasts the industrial robotics market in APAC to grow at a CAGR of 8.7% during the period 2016-2020 in the top 5 segments: automotive, food & bev, industrial machinery, electronics and semiconductor, and other (includes oil and gas, pharmaceutical, plastic and rubber, and heavy industries).
- **Asia-Pacific robotics technology market**, March 2016, 135 pages, Allied Market Research, \$2,850  
An analysis of the APAC countries use and planned use by market, component and application.
- **Global robot machine tools**, April 2016, 69 pages, TechNavio, \$2,500  
Forecasts the global robot machine tools market to grow at a CAGR of 5.13% during the period 2016-2020.
- **Global rubber & plastic industrial robotics market**, May 2016, 53 pages, TechNavio, \$2,500  
Predicts the global industrial robotics market in the rubber and plastic industry to grow at a CAGR of 18% through 2020.
- **Global assembly robots**, April 2016, 196 pages, Grace Market Data, \$2,980  
Global assembly robots market is expected to see fast growth and rapid change during the period 2016-2022.
- **Global welding robots**, April 2016, 199 pages, Grace Market Data, \$3,600  
Annual shipment and sales revenue in this sector are expected to see two-digit CAGRs over the period 2016-2022.



## **PROFESSIONAL SERVICE & MILITARY ROBOTS (7)**

- **Security robots**, June 2016, 174 pages, Markets and Markets, \$5,650  
The global security robots market was valued \$1.34 billion in 2015 and is forecast to reach \$2.36 billion by 2022, at a CAGR of 8.56% between 2016 and 2022.
- **Global construction robots**, May 2016, TechNavio, \$2,500  
The global market for construction robots will exhibit steady 5% CAGR growth during the forecast period to 2020.
- **Global military robots**, April 2016, 72 pages, TechNavio, \$2,500  
Forecasts the global military robots market to grow at a CAGR of 9.36% during the period 2016-2020.
- **Global PR robots market**, May 2016, 56 pages, \$2,500, TechNavio  
The report predicts the global public relation robots market to grow at a CAGR of more than 26% through 2020. One of the primary drivers for this market is the rising need to improve productivity and efficiency in the hospitality sector.
- **Global educational robots market**, May 2016, 57 pages, \$2,500, TechNavio  
Predicts the global educational robots market to grow at a CAGR of more than 21% through 2020.
- **Global service robotics**, December 2015, Markets and Markets, \$4,650  
Expected to grow from \$6.97 billion in 2014 to \$18.02 billion by 2020 at a CAGR of 17.36% between 2015 and 2020.



- **Global entertainment robots**, July 2016, 54 pages, TechNavio, \$2,500  
The global market for entertainment robots and guides will grow at a CAGR of over 20% from 2016 to 2020.

#### Mobile & collaborative robots (4)

- **Global collaborative robots market**, June 2016, 200 pages, Grace Market Data, \$3,800  
Market is expect to witness an exponential growth, with annual shipment and sales revenue from hardware and software growing at more than 42% annually through 2022.
- **Global mobile robotics**, April 2016, 98 pages, TechNavio, \$2,500  
Forecast the global mobile robotics market to grow at a CAGR of 12.21% during the period 2016-2020.
- **AGVs by vision method by use**, May 2015, 141 pages Industry ARC, \$5,250  
Notes that battery-less AGVs are gaining market momentum because AGVs can work longer shifts without recharging.
- **Unmanned surface vehicles**, April 2016, 157 pages, Markets and Markets, \$4,650  
The Unmanned Surface Vehicle (USV) market is projected to grow from \$437.57 million in 2016 to \$861.37 million by 2020, at a CAGR of 14.51%.

#### EMERGING TECHNOLOGIES (4)

- **5G and robotics**, July 2016, 65 pages, Mind Commerce, \$995  
The 5G-enabled autonomous robot market (which includes robotics, IoT, big data and analytics, and AI companies) is forecast to reach \$14.6 billion by 2030. North America will lead the 5G-enabled autonomous robot market with a 41% revenue share.
- **Smart machines market**, May 2016, 54 pages, TechNavio, \$2,500  
Forecasts the smart machines market in the Americas to grow at a CAGR of 14.96% during the period 2016-2020.
- **A.I. market by technology**, February 2016, 150 pages, Markets and Markets, \$4,650  
Artificial Intelligence market forecast to grow from \$419.7 million in 2014 to \$5.05 billion by 2020, at a CAGR of 53.65% from 2015 to 2020.
- **Global robotic software platforms market**, May 2016, 54 pages, TechNavio, \$2,500  
Forecasts the global robotic software platforms market to grow at a CAGR of 4.17% during the period 2016-2020.

#### REMOTE PRESENCE ROBOTICS (2)

- **Teleoperation & telerobotics in industrial IoT**, April 2016, 67 pages, Mind Commerce, \$1,995  
Overall robotics market for industrial IoT will be worth \$45.73 billion by 2021.
- **Global telepresence robots**, June 2016, 57 pages, TechNavio, \$2,500  
The global telepresence robots market is forecast to record a CAGR of more than 53% until 2020.

#### MATERIAL HANDLING AND LOGISTICS (4)



- **Automated material handling market**, June 2016, 108 pages, Knowledge Sourcing Intelligence, \$4,200  
Automated material handling market - including robotic solutions - estimated to be worth \$18.55 bn in 2015 and will expand to \$33.6 bn by the end of 2021 at a CAGR of 10.4%.
- **Global logistics robots industry**, June 2016, 153 pages, Big Market Research, \$2,000  
Forecasts that the sector will register a 32% CAGR through 2020.
- **Global material handling robots**, April 2016, 217 pages, Grace Market Data, \$3,800  
Unit shipments and sales revenue for the material handling robots sector are forecast to be two-digit CAGRs over the period of 2016-2022.
- **US warehouse robotics industry**, March 2016, 131 pages, QYResearch, \$3,800  
Includes profiles of Amazon, Hitachi, Swisslog, Hi-tech Robotic Systemz, GreyOrange and Fetch Robotics.

## SELF-DRIVING VEHICLES AND SYSTEMS (2)

- **Global truck platooning systems**, June 2016, 71 pages, TechNavio, \$2,500  
Truck platooning is perceived as the future of the transportation industry. Multiple trucks travel at an aerodynamically efficient distance and drive cooperatively by maintaining the distance. EU holds a clear lead for truck platooning by 2025.
- **ADAS Market**, February 2016, 200 pages, BIS Research, \$3,999  
ADAS (advanced driver assistance systems include automated cruise control, parking assistance, collision avoidance, rear view, blind spot detection, speed control, driver drowsiness alert, etc.) shipments expected to reach 60.5 million units by 2022.

## AGRICULTURAL ROBOTS AND DRONES (5)

- **Ag drones market**, June 2016, 166 pages, Markets and Markets, \$4,650  
The agriculture drones market is forecast to reach \$4.2 billion by 2022.
- **Global precision ag market**, February 2016, 234 pages, BIS Research, \$3,999  
Industry to grow to over \$7.6 billion by 2022.
- **Global agricultural drones and robots market**, April 2016, Infinium Global Research, \$4,795  
Global agricultural drones market is expected to surpass \$3.5 billion while agriculture robotics market is expected to exceed \$8.1 billion by 2021.
- **Agricultural drones**, Apr 2016, 288 pages, WinterGreen Research, \$4,100  
The worldwide market for agricultural drones was \$494 million in 2015 and anticipated to reach \$3.69 billion by 2022.
- **A.I. in the ag industry**, April 2016, 31 pages, Frost & Sullivan, \$1,500  
Describes A.I. use cases in 5 areas of ag: precision ag, ag drones, vertical farming, driverless tractors, and open data. Forecasts that all ag providers will become technology providers.

## HEALTHCARE/SURGICAL ROBOTS (3)



- **Robotic surgery market**, June 2016, 51 pages, Konzept Analytics, \$800  
Image guided laparoscopic control, rehabilitation robotics and expanded use of robots in general surgery are on the rise but expansion is hindered by effect of soft tissue challenges, challenge of laparoscope control, and regulatory risk.
- **Wearable robots and exoskeletons**, May 2016, 453 pages, Wintergreen Research, \$4,100  
Wearable robots and exoskeletons, at \$36.5 million in 2015, are anticipated to reach \$2.1 billion by 2021.
- **Global medical robotics**, March 2016, 122 pages, Intelliroi, \$4,025  
Global medical robotics market is expected to reach \$11.4 billion by 2020 from \$4.3 billion in 2015 at a CAGR of 23.2%.



## COMMERCIAL & MILITARY UAV/UAS MARKET (20)

Trends for drones show an increasing adoption of hybrid-fueled drones; a growing adoption of nano drones; increasing mergers, acquisitions and consolidations; emerging drone insurance; declining selling prices; rising product bundling; and increasing regulations for commercial drones.

### Military drones

- **Global military airborne collision avoidance systems (ACAS) market**, June 2016, 75 pages, TechNavio, \$2,500  
The report forecast the global military ACAS market to grow at a CAGR of 4.5% during the period 2016-2020.
- **Global military UAV market**, June 2016, 165 pages, Strategic Defense, \$4,800  
Global military UAV market will grow at a CAGR of 4.89% to \$13.7 billion by 2026.
- **Military & commercial drones**, June 2016, 185 pages, Mind Commerce, \$1,995  
Press release didn't provide any teaser or forecast information.
- **Global VTOL UAS market**, April 2016, 71 pages, TechNavio, \$2,500  
The global vertical take-off and landing (VTOL) unmanned aerial vehicle (UAV) market to grow at a CAGR of around 11% through 2020.
- **Military drones market**, April 2016, 868 pages, Wintergreen Research, \$4,100  
The worldwide market for military drones is \$4.4 billion in 2015 and forecast to increase to \$6.8 billion by 2022.
- **UCAV - unmanned combat aerial vehicles**, March 2016, 44 pages, Strategic Defense Intelligence, \$1,950  
Demand for UCAVs will be very high or high in the US, China, and the UK over the next five years.

### Commercial non-military drones

- **Global commercial drone market**, May 2016, 250 pages, TechSci Research, \$3,700  
The global market for commercial drones is projected to grow at a CAGR of over 27% during 2016-2021.



- **Civil UAS market**, April 2016, Frost & Sullivan, \$1,500  
The civil unmanned aerial systems (UAS) market is growing rapidly as public agencies are exposed to the benefits of aerial photography, video, and other sensing capabilities.
- **UAV payload and avionics market**, May 2016, 131 pages, BIS Research, \$3,599  
UAV payload and avionics market to grow at a CAGR of 8.3% from 2016 to 2022 and reach over \$3.9 billion by the end of 2022.
- **Drones for wind turbine inspection**, November 2015, 69 pages, Navigant, \$4,600  
Revenue for wind turbine UAV sales is forecast to total \$6 billion by 2024; support and inspection services \$1.6 billion.
- **Smart autonomous flight technology market**, April 2016, 212 pages, Wintergreen Research, \$4,100  
The worldwide market for smart drone technology (cameras, auto pilots, collision avoidance systems, communication systems, etc.) was \$137M in 2015 and is forecast to reach \$2.7 bn by 2022.
- **Public safety drone market**, May 2016, 20 pages, Arcluster, \$2,450  
Market for search and rescue and public safety drones is forecast to grow at 127% through 2021.
- **Consumer drones**, June 2016, 66 pages, Tractica, \$3,800  
Forecasts the segment to reach a market value of \$5.0 bn by the end of 2021 and that worldwide consumer drone unit shipments will increase from 6.4 million in 2015 to 67.7 million units annually by 2021.
- **Consumer camera drones market**, April 2016, 881 pages, WinterGreen Research, \$4,100  
The worldwide market for camera drones is \$2 billion anticipated to reach \$21.5 billion by 2022.
- **First responder UAVs**, January 2016, 344 pages, Market Info Group, \$4,950  
Report combines a market and technology forecast with an operating concept and buying guide for the first responder industry.
- **Sensors for drones and robots market**, March 2016, Yole Development, \$6,250  
The sensors for drones and robots market is expected to grow at a CAGR of 12.4% from 2015 to 2021, reaching a total revenue of \$709M by 2021.
- **Small drones market**, April 2016, 156 pages, IndustryARC, \$5,250  
Small drones include medium, micro, mini and nano-sized drones but all vendors seem to be multi-rotor.
- **UAV propulsion market**, May 2016, 121 pages, BIS Research, \$3,599  
The UAV propulsion market is forecast to capture a market value of \$2.7 billion in 2015 with gas turbine engine segment the highest share followed by piston, wankel, solar power, electrically powered and hybrid systems.
- **Drone transponders**, June 2016, 268 pages, Wintergreen Research, \$4,100  
The worldwide market for drone transponders is forecast to start from zero and reach \$2.5 billion by 2022.
- **LiDAR drone market**, May 2016, 125 pages, Markets and Markets, \$4,650  
The LiDAR drone market was valued at \$16.1 million in 2015 and is expected to reach \$144.6 million by 2022 at a CAGR of 35.2% between 2016 and 2022.



## THE OFFICIAL INDUSTRY RESEARCH REPORTS (2)



The fact-based backbone for many of these research reports is the **International Federation of Robotics (IFR) annual World Robotics Industrial Robots and World Robotics Service Robots reports**. These two books represent the official tabulation from all the robot associations around the world.

The 2016 reports cover 2015 activity. The two 2016 reports can be purchased for \$2,000. The reports will be published later this summer.



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## **THE ROBOT REPORT**

TRACKING THE BUSINESS OF ROBOTICS

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