

Sector report

Industrial Automation – Beneficiary of movement in supply chains

Research Team

Global | Equities



A Brave New World

Investment summary

In recent years, broad economic and policy developments have highlighted to firms that far-flung, complex supply chains carry unexpected risks. This point was highlighted by then US President Trump's trade wars, and driven home by the Covid-19 pandemic. Given the vulnerabilities that have been exposed, many firms will have to review lessons gleaned and make adjustments in their operations. One likely outcome is a further embrace of digitization and electronic tracking of inventories and logistics, as well as overall industrial automation leveraging on technology such as robotics. The ultimate goal is to deploy key classes of information more efficiently to facilitate production and, in the process, make inventory management more robust to shocks. As such, we expect investments in automation and digitization, already major focus areas, to increase in order to improve efficiency and information flow. We discuss the outlook for various segments (industrial software, industrial IoT platforms, discrete automation, process automation and robotics), as well as the companies exposed to the overall industrial automation theme. Names which are currently BUY-rated include **Emerson Electric [EMR US; FV: USD107]**, **General Electric [GE US; FV: USD131]**; **Mitsubishi Electric [6503 JP; FV: JPY1800]**; **Shanghai Baosight Software [600845 CH; CNY75.90]**; **Shenzhen Inovance [300124 CH; CNY82.60]**; and **NARI Technology [600406 CH; CNY46.20]**.

- **From Globalisation to Localisation and Diversification – the core of it all is Security**
- **Changes in China's industry structure, US-China trade tensions and Covid-19 are key drivers of movements in supply chains**
- **Further digitization and automation inevitable over the longer term**

From Globalisation to Localisation and Diversification – the core of it all is Security

Managing supply chains has never been an easy job. In recent years, broad economic and policy developments have highlighted to firms that far-flung, complex supply chains carry unexpected risks. This point was highlighted by then US President Trump's trade wars. As tariffs were imposed, inputs from China were suddenly more expensive than before. Similarly, sanctions strategies have cut some firms off from the global marketplace, at least temporarily, and disrupted trade flows to other firms dependent on their products. Where the trade wars left off, the pandemic picked up.

Among all the changes and disruptions that the Covid-19 pandemic has brought to our daily lives, it has also revealed the fragility of global supply chains – ranging from goods and services, all the way to commodities such as natural gas. The shift over the past 40 or so years to just-in-time inventory and global manufacturing generated benefits for consumers, corporates, and governments. However, the pandemic

added a new set of unforeseen challenges. On the supply side, border closings and lockdowns kept production sites shuttered, while on the demand side consumers who could not spend on things like vacations and dining out, increased their spending on durable goods. As businesses tried to fill this demand, they found they were not able to secure intermediate goods or ingredients needed for production, and the typically smooth cadence of trade flows became uneven, leading to supply chain disruptions.

The implications of this extraordinary episode are likely to shape the contours of the corporate sector's supply chain management strategies in the years ahead. Given the vulnerabilities that have been exposed, many firms will no doubt feel obliged to review the pandemic's lessons and make adjustments in their operations.

Further embrace of digitization and automation

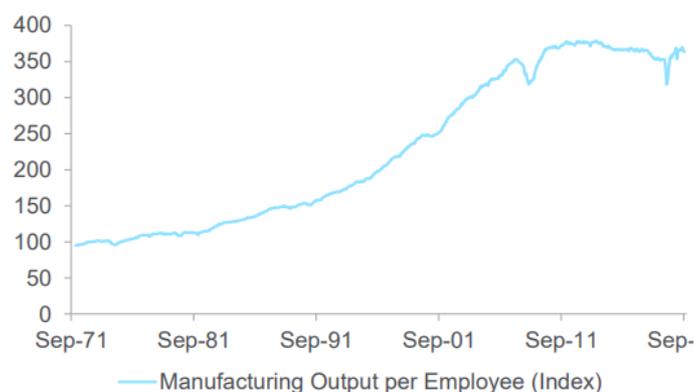
One likely outcome is a further embrace of digitization and electronic tracking of inventories and logistics. This should allow firms to more accurately track and project the granular details of inventory requirements and better manage the accompanying logistics. Such efforts would also support automation, potentially including robotics, and reduce error rates. The ultimate goal is to deploy key classes of information more efficiently to facilitate production and, in the process, make inventory management more robust to shocks.

We expect investments in automation and digitization, already major focus areas, to increase in order to improve efficiency and information flow. We expect an accelerated pace of investment in "connected" industrial technology to be a relatively consistent theme going forward as companies remain focused on building resiliency and driving productivity gains. In other areas like service, remote servicing and other digital solutions promise to reduce the labor intensity of service for industrial markets.

Exhibit 1: The industrial sector has already become much more "employee light" in the U.S.



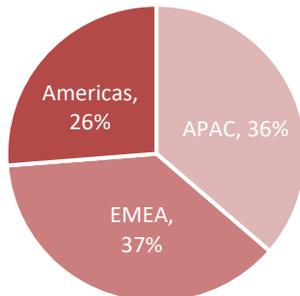
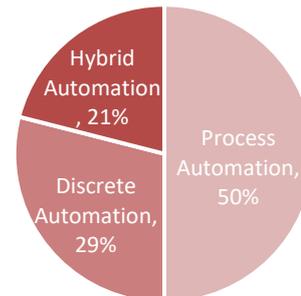
Exhibit 2: ... and the real output per manufacturing employee is now four times what it was in the 1970s



Source: Internal estimates, Datastream

Global industrial automation market overview

The global industrial automation market is estimated to be about EUR170b in 2020, comprising discrete automation, process automation and hybrid automation, based on Emerson's estimates. EMEA and APAC are the largest markets for automation at 36-37% each in terms of global market share, followed by the Americas at 26%.

Exhibit 3: Global Automation Market in 2020 by regions

Exhibit 4: ... and the real output per manufacturing employee is now four times what it was in the 1970s


Source: Internal estimates

Exhibit 5: Comparison of Discrete, Process and Hybrid Automation Markets

	Discrete Automation	Process Automation
Description	Manufacture & assemble parts, components to finished products	Continued process converting raw materials to finished products
Typical Industries	Automotive, general manufacturing, consumer electronics	Oil & gas, chemicals, pulp & paper, mining, metals
Supplier Offering	Programmable logic controllers (PLC), drives, robots, motors, sensors, HMI, software/ engineering	Process controllers (DCS), measurement, actuators (e.g., motors, drives, valves), sensors, electrification, software/ engineering
Industry Penetration	Low-to-moderate: More diverse markets & applications, customers with less expertise and investment capacity	High: Long history, maximize return on large capex
Channels	A mix of direct, distributors, OEMs and system integrators	Mainly direct sales or through EPCs and system integrators
	Hybrid Automation	
Description	A combination of both Discrete and Process Automation	
Typical Industries	Food and beverage, water, pharmaceutical	

Source: Internal estimates

The Industrial Automation market is commonly split between discrete and process automation, while some industries have requirements for both, and a hybrid solution may be adopted.

The largest end markets for discrete automation are Automotive and General Industrial, followed by Technology Hardware and Consumer Goods (such as Food & Bev). For process automation, resource industries are far more important, accounting for close to half of the overall demand, with the largest part coming from the O&G industry. Typical Hybrid/Batch industries include Food & Beverages, Water, Pharmaceutical and Cement industries.

By comparing the growth rates of Process Automation (PA) and Discrete Automation (DA) companies with global IP growth over 2004 and 2020, we see that both the PA and DA markets have clearly outgrown global IP.

During 2013-2017, the outperformance of DA over PA was fundamentally driven by the higher CapEx growth in the discrete industries. The process industries were dragged by pressure especially in the Oil & Gas sector. However, the PA industry recovered in 2018 and outgrew Discrete as the downturn in semiconductors weighed in 2H18. In 2020, the DA market was hit more than the PA market due to the downturn in both Semis and Automotive that are the key sub end-markets for DA. However these are on the recovery track, and cycle debate aside, we see selective re-shoring and generally rising adoption as positives for the DA segment. PA is the most mature segment, and growth is expected to be closer to General IP (3-4% per annum).

Industrial Automation Software clearly outgrew the other sub-sectors with positive growth even in 2020 despite Covid-19 disruptions, suggesting robust underlying demand. This is also the segment with the highest EBIT margins across the various automation applications – at about 30% over the past few years. In comparison, average DA EBIT margins hover around 17-22% while PA margins are around 15% and robotics at about 10%. Looking ahead, we expect rising adoption and increasing product complexity to support the growth; software cross-pollination of hardware is also becoming increasingly apparent.

Under Industrial IoT platforms, the “arms race” continues with now more than 500 offerings by traditional automation, software and tech players, but there is also evidence of consolidation (GE Predix, Rockwell FactoryTalk) and leadership emerging (AWS, Microsoft, Siemens MindSphere); closing the machine-to-machine loop is the ultimate goal. Cambashi estimates c20% 2020-24 CAGR for the market and expects the number of platforms to shrink over time.

As for Robotics, there has been the auto capex cycle headwind but overall rising adoption remains a structural driver, and the market shift towards collaborative robots (cobots) is worth monitoring. In China, domestic industrial robot demand is expected to remain solid over the next decade on import and labour substitution, driven by higher labour costs, cost savings from automation, and higher efficiency. In the near term, however, slowing Fixed Asset Investment growth may be a drag, though there are signs that of some policy easing.

US: Diversification and re-shoring of production

The localisation of supply chains and re-shoring of US manufacturing is set to be a key theme for the next decade. We see this as a tectonic shift accelerated by Covid-19, which has caused supply chain disruptions for many companies, of which more plan to enhance the scope of pre-existing re-shoring plans. There are certainly costs associated with this, with capex spread over years, but this also means that there are companies which stand to benefit from this trend, such as automation companies. We believe that categories of investment spend that would see the largest relative increase are: 1) IT spend that was infrastructure related, 2) manufacturing capacity for existing and new products, and 3) data analytics, equipment upgrades and automation/digitization spend.

European and Japanese players: Still dominant in APAC currently

A CQi survey of manufacturing SMEs (end-users of factory automation) by Credit Suisse revealed that firms plan to raise automation capex by 8% YoY in 2022, but this figure will be sensitive to the macro environment and slowdowns in revenue growth. Japanese and European brands dominate companies' current and future purchase plans; Mitsubishi, ABB, Siemens and Schneider took the top four places respectively and shared similar levels of popularity regarding Original Equipment in current use among firms. Siemens was mentioned almost twice as often compared to the rest of this peer group when discussing future purchase planning.

According to the majority of SMEs this gap will persist for at least the mid-term as more than half stated it will take five years or more for domestic firms to catch up with the incumbents. The only areas domestic players

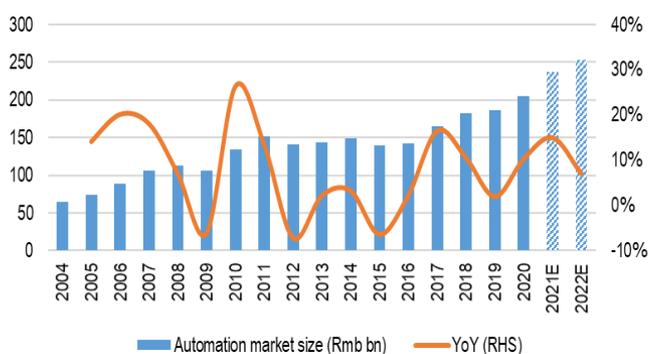
outperform the foreign suppliers were 1) product customization and 2) after-sales technical support. That said, SMEs showed confidence in the growth of domestic firms moving forward, citing plentiful policy support as a driver for their fast catch-up.

China: Expect further market share gain by domestic players

2022 is expected to be another year of growth for automation, driven by resilient demand from major downstream sectors. Labour substitution demand was accelerated by the pandemic, and attempts to achieve supply chain independence are also expected to support automation growth demand. Easier credit, supported by the government, is also in place to encourage such investments. The improving investment payback period enabled by greater economies of scale and technology development is also expected to stimulate factory upgrade demand.

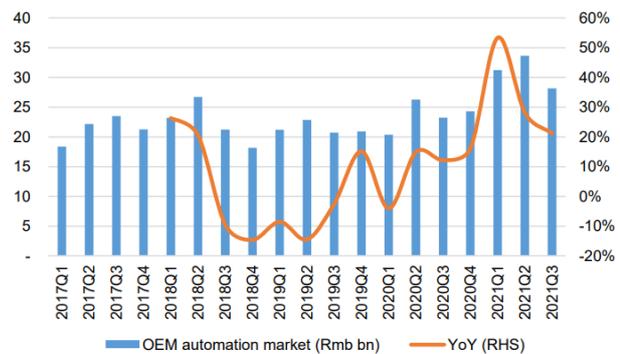
According to data from Gongkong (中国工控网), the automation market in China usually grows for two to three years before a brief slowdown for about a year. In the current cycle, automation demand started to pick up since 4Q19 and has maintained a rather robust momentum. In 2020, the pandemic accelerated the labour substitution trend in China's manufacturing segment. Mask machines contributed to automation demand, especially in 2Q20. In addition, China's push for carbon neutrality and supply chain independence also boosted capacity expansion related demand from Li-ion battery, EV, and semi industry. In 2021, automation demand saw a spike in 1Q, as factories stocked up in fear of component shortage, especially in chips. Demand remained high at 28% YoY in 2Q, even from a high base created by mask machines, as demand from emerging sectors, including Li-ion battery, PV, and semi stayed strong. A resilient growth of over 20% was maintained in 3Q, even under several macro headwinds.

Exhibit 6: Automation growth – historical trends suggest robust growth over the longer term, despite certain brief setbacks



Source: Gongkong

Exhibit 7: In the current cycle, automation demand started to pick up since 4Q19; 3Q21 was impacted by power curbs and we expect this to recover



Source: MIR

We are positive that domestic players would continue to gain market share from foreign players in 2022, leveraging on their ability to better customise at a lower cost. This is particularly the case in emerging sectors, such as PV and Li-ion battery, where the fast capacity expansion requires swift response and tailor-made solutions. For example, Inovance and Estun both introduced heavy-loading SCARA robot in Sep-2021 for Li-ion battery, which is well accepted by clients in their assembly procedure. Compared with 6-axis robot, heavy-loading SCARA robot is more efficient in operation, space, and cost. The successful shipment effectively increased their market share in the robot market in 3Q21.

A CQi survey also showed that manufacturing SMEs believe local players' better post-sales services and their ability to make customised products are the major reasons for manufacturing firms to adopt domestic automation products, in addition to the low price. In addition, most SMEs are of the view that a more complete automation supply chain can be built in the next six years.

Implications on Equities

Increased re-shoring and diversification of supply chains is likely to lead to a capex cycle and increased need for robotics/automation, which would have implications for corporates. We consider the likely beneficiaries in the table below. A number of the stocks are currently trading at high or fair valuations, and we would accumulate quality names on pullbacks, especially those exposed to positive structural growth trends.

Exhibit 8: Companies exposed to the Automation theme

Ticker	Company	Currency	Price (LC\$)	Sector		Market Cap (LC\$b)	BOS-Morningstar Rating	Fair Value (LC\$)	Upside (%)	Div yield (%)	Forward P/E
Multi-industrials/Automation											
GE US Equity	General Electric Co	USD	94.47	Industrials	Industrial Conglomerates	103.7	Buy	131.0	38.3	0.3	23.5
HON US Equity	Honeywell International Inc	USD	208.51	Industrials	Industrial Conglomerates	143.5	Hold	225.0	8.6	1.9	23.1
ROK US Equity	Rockwell Automation Inc	USD	348.85	Industrials	Electrical Equipment	40.5	Sell	275.0	-20.7	1.3	31.5
EMR US Equity	Emerson Electric Co	USD	92.97	Industrials	Electrical Equipment	55.4	Buy	107.0	15.5	2.3	18.9
PH US Equity	Parker-Hannifin Corp	USD	318.12	Industrials	Machinery	40.9	Hold	296.0	-6.0	1.4	17.2
ETN US Equity	Eaton Corp PLC	USD	172.82	Industrials	Electrical Equipment	68.9	Sell	132.0	-23.0	1.8	23.3
SIE GY Equity	Siemens AG	EUR	152.68	Industrials	Industrial Conglomerates	129.8	Sell	130.0	-14.9	2.7	17.7
ABBN SW Equity	ABB Ltd	CHF	34.90	Industrials	Electrical Equipment	71.7	Hold	35.0	0.3	2.4	23.3
SU FP Equity	Schneider Electric SE	EUR	172.46	Industrials	Electrical Equipment	98.1	Sell	130.0	-24.8	1.8	26.3
KGX GY Equity	KION Group AG	EUR	96.48	Industrials	Machinery	12.7	Hold	95.0	-1.5	1.6	18.0
6503 JP Equity	Mitsubishi Electric Corp	JPY	1458.50	Industrials	Electrical Equipment	3131.7	Buy	1800.0	23.4	3.0	12.4
6954 JP Equity	FANUC Corp	JPY	24380.00	Industrials	Machinery	4922.6	Hold	28000.0	14.8	2.2	26.5
6506 JP Equity	Yaskawa Electric Corp	JPY	5640.00	Industrials	Machinery	1504.1	Hold	5200.0	-7.8	1.0	30.2
6861 JP Equity	Keyence Corp	JPY	72280.00	Information Technolog	Electronic Equipment, Instrum	17579.1	Sell	49000.0	-32.2	0.4	55.9
6645 JP Equity	Omron Corp	JPY	11460.00	Information Technolog	Electronic Equipment, Instrum	2363.6	Sell	9900.0	-13.6	0.9	30.6
600845 CH Equity	Shanghai Baosight Software Co	CNY	60.83	Information Technolog	Software	80.8	Buy	75.9	23.4	1.5	38.0
300124 CH Equity	Shenzhen Inovance Technology	CNY	68.60	Industrials	Machinery	180.8	Buy	82.6	19.0	0.7	43.5
600406 CH Equity	NARI Technology Co Ltd	CNY	40.03	Industrials	Electrical Equipment	222.0	Buy	46.2	14.8	1.4	30.3
669 HK Equity	Techrnic Industries Co Ltd	HKD	155.20	Industrials	Machinery	286.7	Buy	180.0	16.2	1.4	27.8

Source: Bloomberg, Internal estimates

AUTOMATION/MULTI-INDUSTRIALS – AN ESSENTIAL PIECE IN THE PUZZLE TO LOWER COSTS IN THE LONGER TERM

Re-shoring is likely to have a mix of higher costs (e.g. wages, environmental compliance) and savings (e.g. tariffs, transport costs), but the key argument against re-shoring has always been made on the grounds of lost efficiency and ruinous costs. For this very reason we believe automation is an essential piece in the puzzle to help drive lower operating costs and higher productivity over the long-term.

Indeed, manufacturers are likely to focus on productivity to preserve margins - making **industrial automation a key beneficiary** of re-shoring. Names such as **Rockwell Automation** and **Emerson Electric** are likely beneficiaries of re-shoring of US operations and shifts in supply chains. They are ideally positioned to provide automation/digital solutions that could improve efficiency/productivity to its customers faced with a myriad of supply chain inefficiencies. Rockwell is the largest U.S. pure-play automation-focused company with significant expertise in automation-focused supply chain management. As potential manufacturing customers seek to improve their supply chain resiliency by establishing more "local-for-local" operations, these customers are likely to increasingly turn to Rockwell's services.

At the same time, more re-shoring means that there is likely **more capex growth** in the receiving country, for instance the US. Based on earlier estimates by Bank of America, for every USD10b of manufacturing revenue that is moved back the US, there is a related ~USD3.8bn of capex spending (1/3 buildings, 2/3 equipment). This calculation is based off the ratio of gross plant, property, and equipment (PP&E to revenue for industrial companies in the S&P 500. If USD70bn of manufacturing revenue were re-shored, this would add 100bp to US capex growth over the next decade. Firms such as **Parker Hannifin** and **Eaton** are likely beneficiaries from greater US manufacturing capex spending.

Supply disruptions have also led to full warehouses and a surge in warehouse construction, adding to an investment cycle already being driven by the long term eCommerce theme. As such, firms with a focus on **warehouse automation** would also benefit. **Honeywell** through its Intelligrated warehouse automation solutions platform can help ameliorate supply chain/labor challenges created by significant SKU growth and strong global package-related demand. The firm is a diversified global leader in the manufacturing of

aircraft components and technology as well as offering building solutions, automation control, and safety and productivity solutions, with respect to supply chain management. We think Honeywell's Intelligrated warehouse automation products and solutions in particular seem well positioned to continue to benefit from a significant build-out in automation within warehouses/distribution centers that expedite the throughput of products through global supply chains. The firm offers advanced material handling systems to reduce the time and labor costs associated with inbound processing, sortation systems to support shipping activities, as well as smart, flexible palletizing solutions. Given continued high rates of warehousing/distribution center growth as well as customers' increasing preference for higher levels of automation within their warehouses/DCs, Honeywell will stand to benefit. **KION**, on the other hand, is the #1 supplier globally for warehouse automation systems and #2 for material handling trucks. KION's Supply Chain Solutions business supplies robotic palletizing/de-palletizing systems, storage systems, and sortation systems for warehouses, and has already seen its order backlog hit a record high in 2021. Penetration of automation in warehouses is less than 10%, leaving significant penetration upside. Ongoing eCommerce penetration and higher investment in supply chain resiliency are potential key drivers.

Among the Japanese firms, **Fanuc** provides factory automation products, such as industrial robots, computerized numerical control (CNC) systems, and compact machining centers (Robodrills) to mainly manufacturing companies globally. **Yaskawa Electric**, on the other hand, is one of the leading players in the servo motors/controllers, inverters, and industrial robots markets. With a strong core in its "mechatronics" technology, which is an engineering field that integrates mechanical and electronics principles into devices/systems and a term pioneered by the company, it is looking to realize synergies among its products by making a shift from being a provider of motion-control products to a provider of data-driven factory automation solutions, through its i3 mechatronics initiative. **Keyence** develops and sells factory automation sensors, machine vision systems, barcode readers, laser markers, measuring instruments, and digital microscopes, while **Mitsubishi Electric** utilizes its technology related to the control of electricity to cover a broad spectrum of business fields, including factory automation, or FA, elevators/escalators, social infrastructure-related equipment, satellite and communication equipment, and air conditioners. The company has the leading domestic share and/or top 5 global share in various products, including program logic controllers, or PLCs, for factory automation, electric systems equipment for trains, elevators/escalators, turbine generators, and power semiconductors. Its key drivers—the industrial automation systems segment (which includes FA equipment as well as automobile equipment) and energy and electric systems segment (which includes heavy electrical equipment like elevators, train systems, and power generation equipment)—together average about 65% of total operating income excluding eliminations over the past three years.

China has also seen a rise in national champions, with even more on the way. In the recent 14th Five Year Plan relating to the development of the robot industry, it is mentioned that in 2025, China plans to become the source of global robot technology innovation, a gathering place of high-end manufacturing and integrated applications. Companies such as **Shenzhen Inovance** (industrial automation giant in China and largest domestic SCARA robot manufacturer in China), **NARI Technology** (develops and manufactures power grid automation and industrial control products), and **Shanghai Baosight** (leading player in China's industrial software market, enabling heavy industrial companies in their automation and digitization process). As for **Techtronic Industries**, it is the second largest power tools manufacturing company globally with ~15% share. The industry had faced challenges due to supply chain disruptions from the perspective of semiconductors (for Li-ion battery management system), insufficient material supply such as Li-ion battery cell and suspension of production in Cambodia in 2Q and Vietnam in 3Q along with container shortage for shipments from Asia to US/EU. However Techtronic was able to increase its prices in 3Q21 to offset rising material costs and the firm has been able to gain market share in expense of peers. The firm had made some preparations for supply chain disruptions by engaging Chinese battery cell suppliers instead of just Korean companies and outsourced certain low-end products for more stable supply, amongst other measures. Eagle-eyed readers may also wonder why it is that **Midea Group**, a Consumer/Household Durables company is listed in our table. The reason is because the company had acquired **KUKA**, the German robotics maker, and is increasing its investments in the robotics/intelligent manufacturing space as well.

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