



China made - the end, or a new beginning?

The RBC Emerging Markets Equity team

Rising trade tensions between China and the U.S. have focused a spotlight on company supply chains and the risks associated with being over dependent on one specific country.

During 2018, the U.S. administration announced tariffs on a broad range of Chinese imports, from aluminum and steel to flat-screen televisions and medical devices. With the prospect of further tariffs looming, companies have naturally looked to reevaluate their supply chains and in particular their reliance on China.

However, company supply chain shifts have been underway for some time. We highlight three longer-term trends that predate the recent trade-related tensions and which, in our view, will only be accelerated by them:

- 1. China in transition:** The evolution of China from a low-cost manufacturing hub to a world-leading exporter of value-add products, aided by government support and rising innovation.
- 2. The rise of low-cost manufacturing across Asia:** The gradual shift of some manufacturing capabilities from China to lower-cost regions. While abundant cheap labour has been the primary driver of the shift so far, government policy will be critical to improving competitiveness going forward.
- 3. Automation and localisation:** The increased use of automation in production means labour is no longer a key constraint, while the rise of e-commerce makes proximity to the end consumer paramount. Localising production allows companies greater control of their supply chains, increases flexibility and reduces delivery times and costs.

In this report, we explore the long-term trends driving company supply chains and assess the implications for China as an important manufacturing hub.

Global supply chains in context

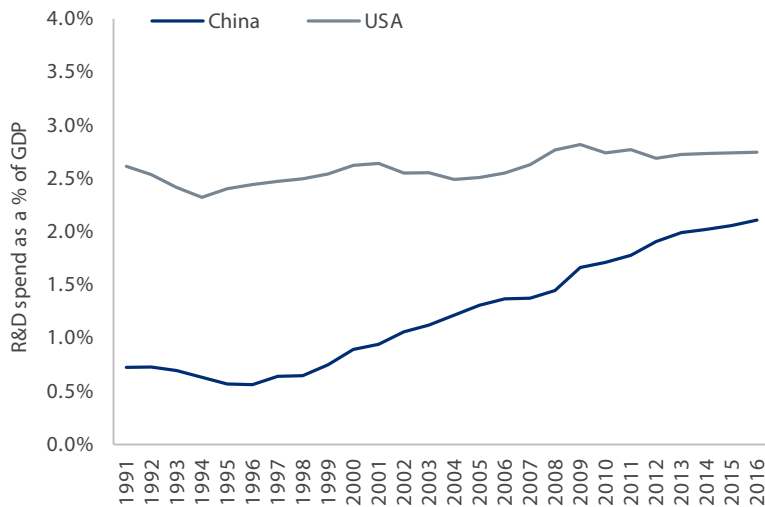
Manufacturing supply chains are far more global and complex than they have been in the past. As an example, a standard washing machine produced in the U.S would typically comprise over one third steel (mostly from Canada), approximately one quarter plastic (predominantly from the Middle East) and several printed circuit boards (largely from China)¹. The complexity of these supply chains presents a material issue for companies when considering making changes to the production of goods.

Secondly, the concept of “global” is highly nuanced. Companies with “global” brands and “global” customers will typically organise their supply chains into sub-regions, each of which is organised around a hub. European supply chains tend to be concentrated around Germany, for instance, while Asia tends to have China as its main hub. Thus, geography matters when determining company supply chains.

These observations provide a useful framework when assessing the direction of company supply chains over the longer-term, and highlight the significant complexity as well as importance of the end market.

¹Morgan Stanley Research, November 2018.

Exhibit 1: Growing R&D spend as a % of GDP in China versus the U.S.



Source: OECD, 2019, gross domestic spending on R&D (indicator), accessed in January 2019.

up the value-added manufacturing supply chain. To help accomplish these goals, Research & Development (R&D) spending in China has increased substantially in recent years, which has in turn driven innovation (Exhibits 1 and 2).

China’s evolution has also been driven by economic progress. Exhibit 3 tracks the relationship between China’s GDP per capita and its exports to the U.S. through the Exports Sophistication Index (ESI). The ESI aims to measure the “sophistication” level of a country’s exports by determining the average GDP of all countries that export a specific product. As Exhibit 3 shows, in 2002 the majority of China’s exports to the U.S. were low value-added goods such as finished metal shapes and electrical equipment. Other countries that produced those types of products were in the average GDP per capita category of USD5,000 – USD10,000 hence at the lower end of the income spectrum. Moreover, in 2002 China did not export products that were produced by countries in the higher GDP per capita categories. In 2017, the majority of China’s exports were in a higher country income category of USD10,000 - USD15,000, and China also exported goods that were produced by countries with income levels as high as USD35,000 - USD45,000³.

²Goldman Sachs Research, March 2017. ³HSBC Research, October 2018. Note: The Exports Sophistication Index (ESI) was developed by Japan’s Department for Trade and Industry. The ESI index shows the percentage of exports from China to the U.S. that are also produced by countries that have a similar GDP per capita. The ESI is based on the assumption that high-value-added products are likely to be exported from high-income countries, and low value-added products are likely to be exported from low-income countries. The index score for a product is the weighted average of the per capita GDP of its exporters, using their respective shares of exports as weights.

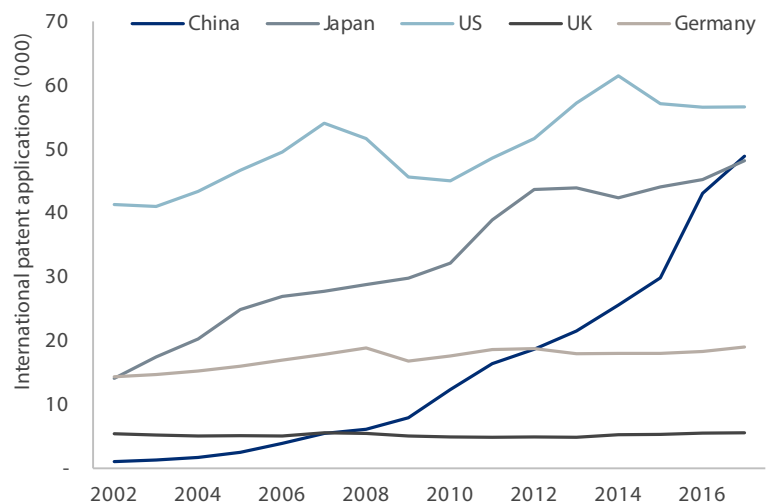
1. China in transition

Over the past decade, China has gradually moved away from low-cost manufacturing to emerge as a competitive exporter of value-add products on a global scale. Value-add products tend to be more sophisticated items which consist of numerous components. They require more complex manufacturing processes and supply chains, and the additional steps taken to manufacture these goods can help increase their prices. Two examples of value-add products are smartphones and cars.

This shift away from low-cost manufacturing has been driven actively by the Chinese government’s efforts and has also been part of a more organic shift resulting from China’s economic progression.

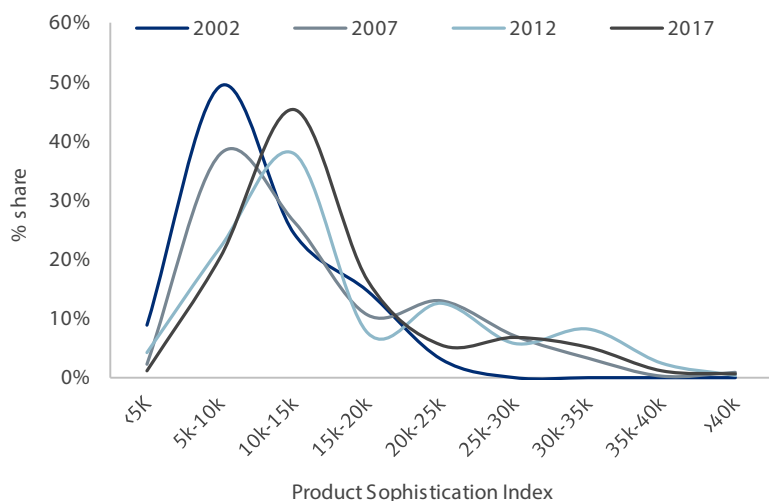
Since the 1950s, the Chinese government has released a series of Five-Year Plans to outline social and economic priorities. Its latest Five-Year Plan (2016-2020) alongside its “Made in China 2025” directive, highlights a focus on intelligent manufacturing, self-sufficiency and moving

Exhibit 2: China’s international patent applications are rising



Source: HSBC, World Intellectual Property Organization (WIPO), December 2017.

Exhibit 3: ESI for China's exports to the U.S. shows China moving up the value-add curve (% share, USD)



Source: US Census Bureau, World Bank, HSBC, December 2017.

To put this in a global context, China has experienced the largest growth in value-add exports over the past decade, surpassing Germany to become the biggest value-add exporter globally on an aggregate basis (Exhibit 4).

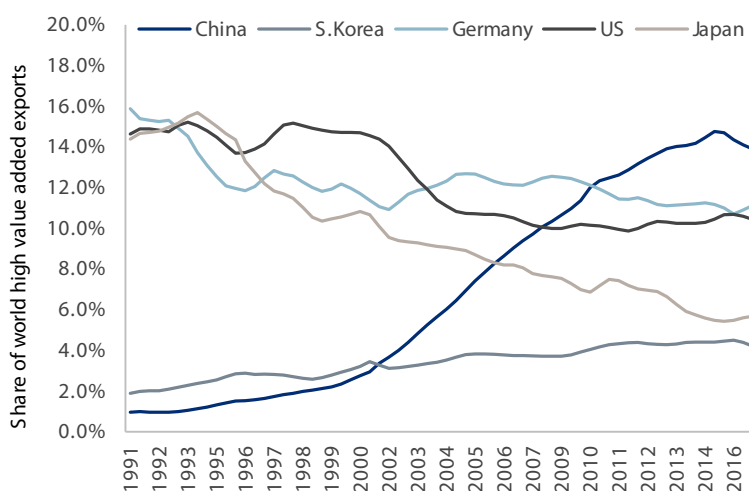
China has been particularly strong in the production and export of cars and smartphones. Chinese phone manufacturers have grown their global market share from 11% in 2011 to 33% in 2015, while Chinese automotive manufacturers have grown their global market share to 12% in 2016, up from 3% in 2000⁴.

China's progression up the value-add curve contrasts with countries such as Bangladesh and Vietnam whose exports largely compete with countries in the lower-income brackets. These countries have the potential to benefit as China forgoes export share in the lower-end product segments.

2. The rise of low-cost manufacturing across Asia

Companies have been diversifying their supply chains away from China to lower-cost regions for some time, and we expect the recent trade tensions to accelerate this further. The apparel industry, for example, has seen a migration of production facilities to South East Asia, due to lower labour costs (Exhibit 5). As illustrated in Exhibit 6, China produced approximately 33.7% of the apparel imported into the U.S. in 2017 versus 39.2% at its peak in 2010. China's loss has largely benefited Vietnam, whose share has risen from 8.2% to 14.4% during the same period⁵.

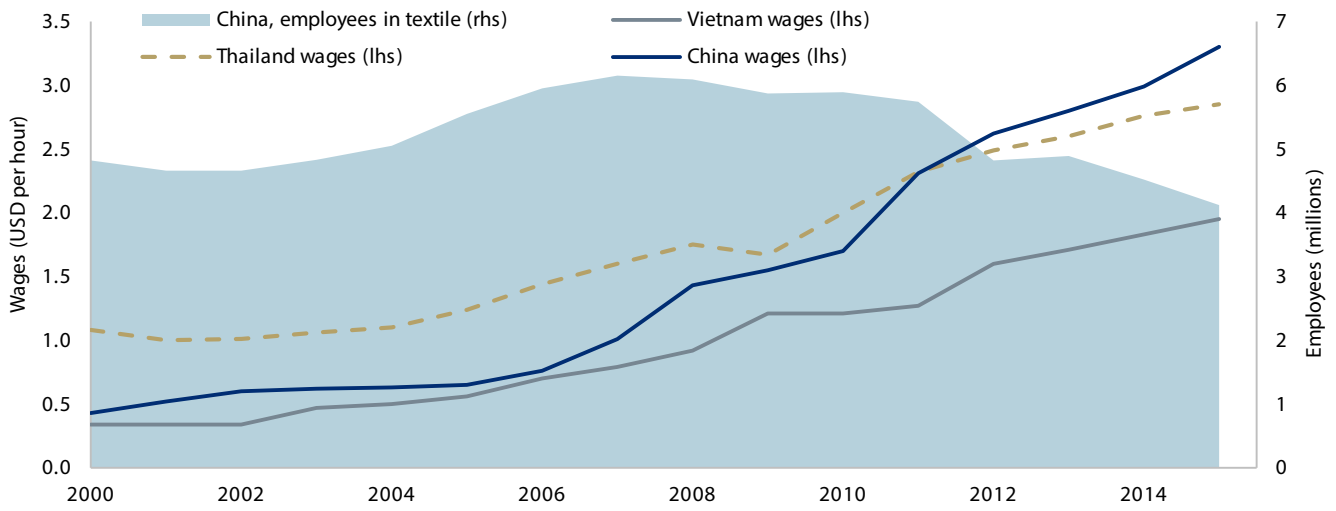
Exhibit 4: Global growth in value-add exports driven by China



Source: WTO, Morgan Stanley Research, December 2016.

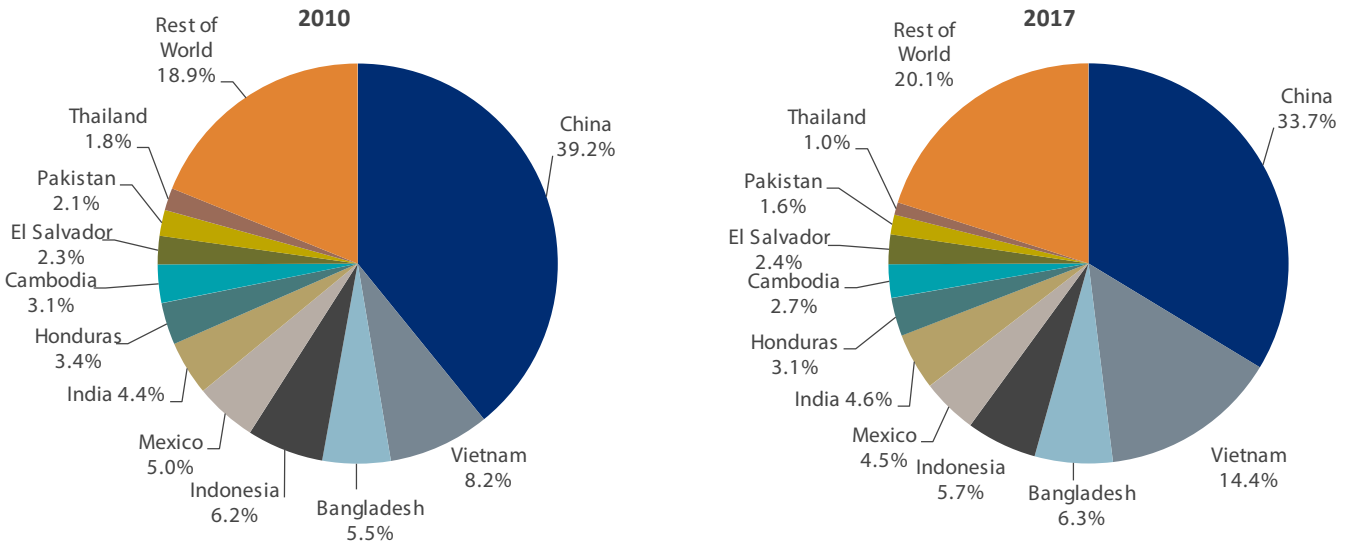
⁴Gartner; IHS; Goldman Sachs Research, March 2017. ⁵Morgan Stanley Research, November 2018.

Exhibit 5: Hourly wages in the textile industry



Source: Economist Intelligence Unit, US Census Bureau, December 2015.

Exhibit 6: U.S. Apparel imports by country (USD) - 2010 (LHS) versus 2017 (RHS)



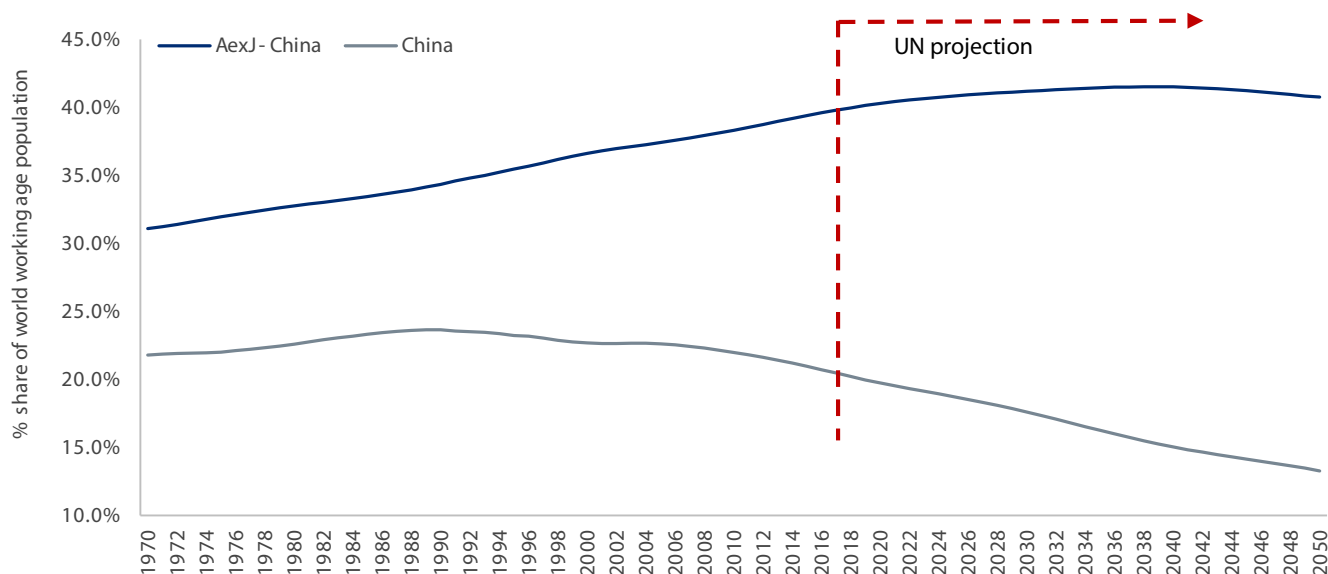
Source: Office of Textiles and Apparel (OTEXA), October 2018.

As well as cheaper labour costs, the Asia-ex-Japan-ex-China region offers more favourable demographic trends. In 2016, the region accounted for 40% of the global working age population versus China's 21%, and this demographic disparity is projected to widen given China's increasingly ageing population (Exhibit 7).

However, abundant, cheap labour alone will not be enough to secure future manufacturing success for the Asia-ex-Japan-ex-China region. Other costs are equally important and differ substantially between countries. For example, it has proven relatively simple for textile companies to find skilled labour and establish factories in Vietnam. This has enabled Vietnam to grow its exports to both the U.S. and China over the past 10 years, unlike regions such as Bangladesh where poor infrastructure, high levels of corporate taxation and local bureaucracy have presented significant hurdles for manufacturing Foreign Direct Investment (FDI). This is reflected in the World Bank's Ease of Doing Business Index, which ranks countries from 1-190 based on how easy it is to start and operate a local firm. As shown in Exhibit 8, Bangladesh features at the bottom of the pile, from both an Asian and global perspective.

Going forward, policymakers will need to focus on reducing costs, introducing tax incentives and improving infrastructure in order to raise competitiveness and attract manufacturing FDI. We have seen signs of positive progress in this respect. In Indonesia, for example, the current president Jokowi has invested heavily in improving connectivity and removing infrastructure bottlenecks across the country. Should Jokowi be re-elected in April 2019, he is expected to reform the outdated labour law which has historically represented another key deterrent for manufacturing investment in the country.

Exhibit 7: More favourable demographic trends in Asia-ex-Japan-ex-China region



Source: UNDESA, World Population Prospects: The 2017 Revision, June 2017. Note: Working age population is defined as 15-64 years.

Exhibit 8: Ease of doing business Index rankings for Asia countries, 2019

	Days to get a construction permit*	Reliability of supply of electricity**	Days to start a business#	Time to register a property##	Ease of doing business ranking (Rank)
Singapore	41	7.0	1.5	4.5	2
Hong Kong	72.0	8.0	1.5	27.5	4
Korea	27.5	8.0	4.0	5.5	5
Taiwan	82.0	7.0	10.0	4.0	13
Malaysia	54.0	8.0	13.5	11.5	15
Thailand	118.0	8.0	4.5	9.0	27
Japan	175.0	8.0	11.2	13.0	39
China	155.1	6.0	8.6	9.0	46
Vietnam	166.0	7.0	17.0	53.5	69
Indonesia	200.1	5.8	19.6	27.6	73
India	94.8	6.5	16.5	69.1	77
Sri Lanka	87.0	6.0	9.0	39.0	100
Philippines	122.0	6.0	31.0	35.0	124
Pakistan	262.8	0.0	16.5	144.1	136
Bangladesh	273.5	0.0	19.5	270.8	176

Source: World Bank, Doing Business, HSBC, December 2018. Note: Economies are ranked on their ease of doing business, from 1–190. A high ease of doing business ranking means the regulatory environment is more conducive to starting and operating a local firm.

*Time required to complete all formalities to build a warehouse like submitting docs, obtaining connection and registration warehouse; **higher values indicate greater reliability of electricity supply and greater transparency of tariffs; #time to start a limited liability company; ## captures median duration it takes to complete the procedure (property lawyers, notaries or registry officials).

While countries such as Vietnam and Indonesia stand to benefit as companies continue to diversify production away from China, China is unlikely to be displaced as an important manufacturing hub in the medium-term. China offers several key advantages including a developed supply base, best-in-class infrastructure, increasing innovation and importantly a huge domestic market. Its scale will be difficult to replicate by any single country. To put this in context, it takes the entire Asia-ex-Japan-ex-China region to match the global manufactured export share of China (17.6% for China compared to 19.3% for Asia-ex-Japan-ex-China, as of December 2016)⁶.

3. Automation and localisation

The nature of cost reduction is changing. Previously, most cost optimisation took the form of geographic relocation as firms shifted production to China and then countries such as Vietnam as they sought lower-wage workers⁷. However, with labour costs rising even in the lower-cost countries, and continued challenges to the availability (particularly in China) and skill (in, for example, Bangladesh) of labour, companies have been seeking alternative solutions. This has led to a rise in automation, as evidenced by the

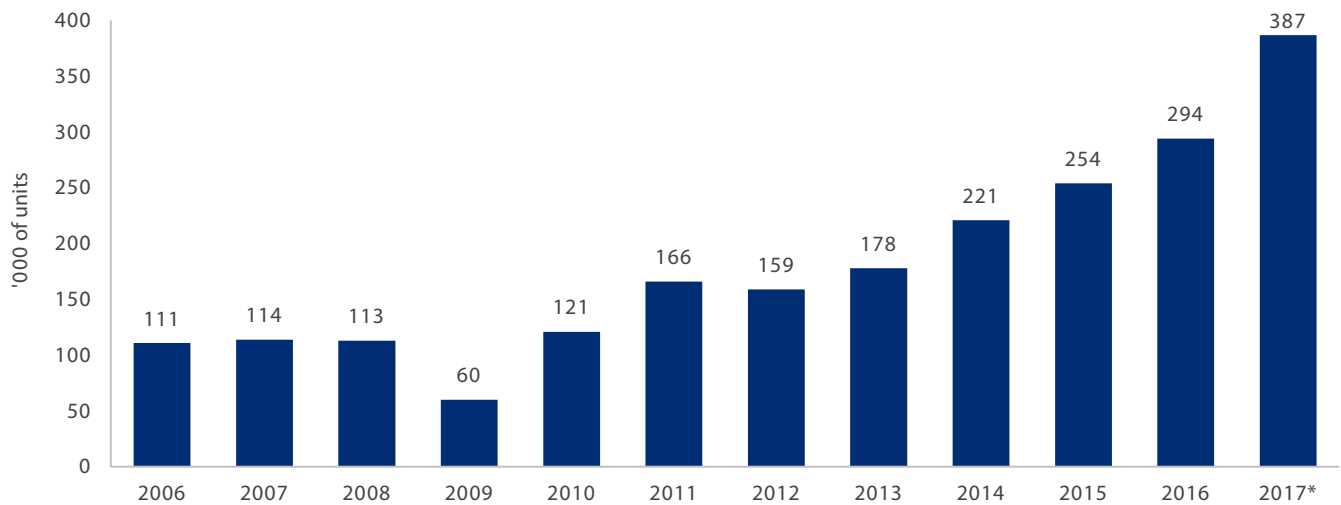
surge in demand for industrial robots (Exhibit 9).

Moreover, while labour costs have been rising, the cost of robots has been coming down. Exhibit 10 plots the average robot price against the average pay in the manufacturing sector in the U.S. over time. As can be seen, the average robot price in the U.S. has fallen significantly in absolute terms, and even further relative to labour costs. We expect this pattern to continue as robot production expands⁸.

According to the International Federation of Robotics (IFR), Asia has been the main driver of the demand for robots, accounting for 65% of global robot sales in 2016. In particular, China has been the world's largest market for robot sales since 2013, representing 30% of global sales in 2016 versus 25% in 2013. The Chinese government's "Made in China 2025" directive highlights robotics as a key national priority. China is targeting an increase in robot density to 150 units per 10,000 employees by 2020, versus 68 units in 2016. IFR estimates that sales of robots in China will grow at an average annual rate of 25% between 2017 and 2020, and that China's global market share will increase from 30% in 2016 to 40% by 2020⁹.

⁶ Morgan Stanley Research, November 2018. ⁷ Deutsche Bank Research, June 2018. ⁸ McKinsey & Company, September 2017. ⁹ Morgan Stanley Research, November 2017, IFR <https://ifr.org/>

Exhibit 9: Estimated worldwide shipments of industrial robots



Source: International Federation of Robotics (IFR), July 2018; *2017 is based on preliminary results.

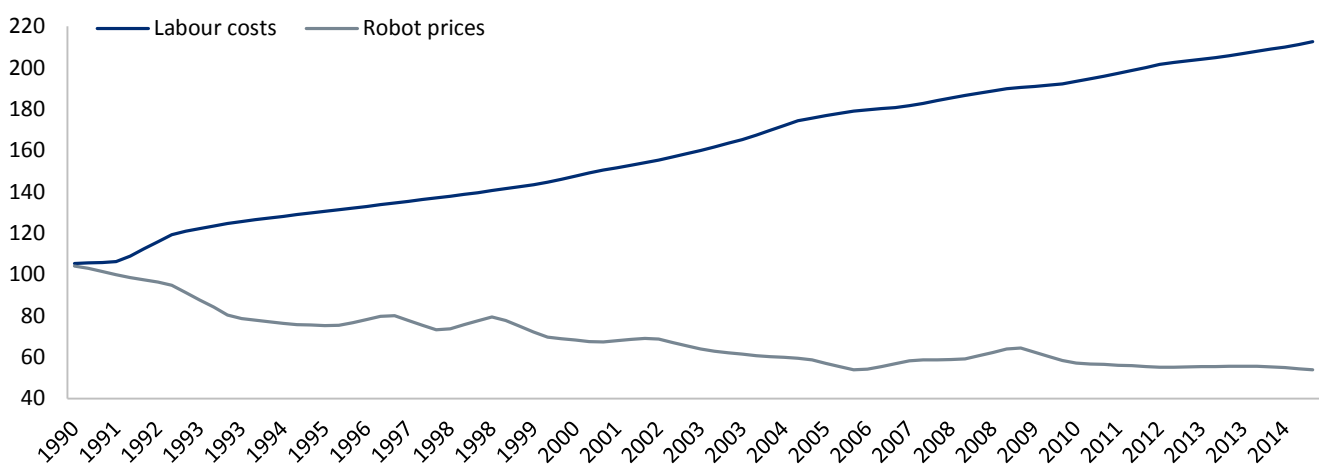
For the past few years, companies have been investing in order to automate production in existing factories. For example, Adidas has invested over USD200m per year to automate production lines in its Vietnam facility, Hon Hai Precision has been developing industrial robots as it targets 30% automation at its Chinese factories by 2020, and Chinese appliance maker Midea has halved the number of workers at its Wuhan factory by increasing the use of robots¹⁰.

There has also been a trend to relocate and localise production. The rise of e-commerce and fast fashion has accelerated this shift, as proximity to the end consumer and the ability to customise and refresh product ranges have become paramount. Adidas has been

at the forefront of this trend, having constructed a “Speedfactory” in Ansbach, Germany in 2015 and more recently in Atlanta, U.S.. As cited in Adidas’ 2017 Corporate Strategy Report: “Using smart manufacturing instead of centralised production... brings production closer to where the consumer is. It opens doors to the creation of products completely unique to the fit and functional needs of our consumers, through a combination of the craft of shoemaking and cutting-edge technology.”¹⁰

Thus, automation and e-commerce are increasingly replacing labour as the main consideration for companies when evaluating their supply chains.

Exhibit 10: Index of average robot prices and labour compensation in manufacturing in the U.S. (1990=100%)



Source: Economist Intelligence Unit, IMB Institut für Arbeitsmarkt- und Berufsforschung, International Robot Federation, US Social Security data; McKinsey analysis, September 2017.

¹⁰Deutsche Bank Research, June 2018. ¹⁰ Adidas Corporate Strategy, 2017. https://report.adidas-group.com/media/pdf/EN/adidas_AR_2017_Corporate%20Strategy_EN.pdf

Conclusion

We believe that as China continues to focus on increasing its share of value-add exports, those lower-cost countries focused on improving competitiveness and attractive manufacturing FDI will be the long-term winners in our view. Vietnam has represented a notable success story to-date, and we are hopeful that other countries, such as Indonesia, will follow in its footsteps.

Despite recent trade tensions, we believe China's importance as a manufacturing hub will continue to grow as it gains market share in value-add exports. In our view, this will more than offset the losses in the lower-cost segments. In the near term, changes to company supply chains will take time and will require significant planning and capital expenditure, while in the longer term, China will benefit from its unparalleled scale, best-in-class infrastructure, government support and proximity to the vast domestic market.

Moreover, as China continues to increase its self-sufficiency through rising R&D and innovation, we expect the Chinese government to continue making efforts to increase intellectual property rights and prevent forced technology transfer from foreign companies. Recent progress in this respect includes enhancements to patent protection and foreign investment laws, as well as increased penalties for infringement. Further progress would help to de-escalate trade tensions in future.

Companies with pre-existing facilities and partnerships across countries will be best positioned to manage trade-related risks in the near term, while those companies adapting to the structural themes of automation and e-commerce should benefit in the longer term.

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