INTERNATIONAL TRADE ADMINISTRATION

2016 Top Markets Report Manufacturing Technology Country Case Study

China

China ranks third overall in this year's Manufacturing Technology Top Markets Report. The country has the largest market for manufacturing equipment in the world, but concerns of a slowing economy will affect growth opportunities for U.S. exporters. Despite robust trade, the U.S.-China commercial relationship is also fraught with policy challenges that include market access barriers, concerns over intellectual property protection, transparency in standards development, and concerns over dual-use technology transfer.

Overall Rank	2015 U.S. Exports:	2009-2015 Export Growth:
3	3rd	18th
	2012 UNIDO Industrial Competitiveness Ranking:	**UNIDO Industrial Competitiveness Growth Ranking:**
	4th	2nd

Subsector Ranking

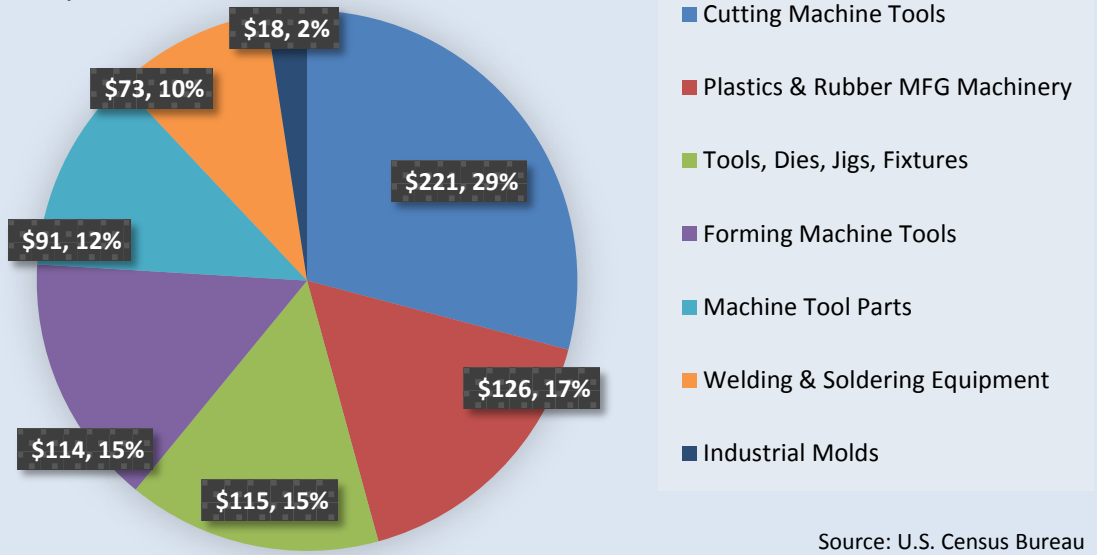
Machine Tools (Cutting):	Machine Tools (Forming):	Welding & Soldering Equipment:	Plastics & Rubber Equipment:	Tools, Dies, Jigs, and Fixtures:	Machine Tool Parts:	Industrial Molds:	Additive Manufacturing Equipment:
2nd	**2nd**	**3rd**	**4th**	**4th**	**3rd**	**4th**	**3rd***

ITA expects that U.S. manufacturing technology exports to China will decline through 2017, owing to the country's general economic slowdown. Exports to China fell sharply by 23.2 percent between 2014 and 2015, and despite robust double-digit average annual growth (CAGR) between 2009 and 2014, many analysts believe China is in the beginning of a long-term economic slowdown that will decrease the country's manufacturing output for some years. Nevertheless, China remains an important market for U.S. exporters due to its sheer volume, and will continue to present opportunities in the near future.

Country Overview

China is the largest country by population, with 1.3 billion citizens. For the past two decades, the country has sought rapid growth through urbanization, growing its domestic middle class, and increasing manufacturing capability. China is the second largest global economy by nominal GDP, and it is a global leader in industrial output ranging from automobiles to consumer goods, construction and mining, medical devices, and more.

Figure 1: U.S. Manufacturing Technology Exports to China, 2015 (in USD Millions)



Source: U.S. Census Bureau
Foreign Trade Division

In China, the high-end machinery market is largely composed of state-owned enterprises and multinational companies. These companies often possess significant intellectual property assets in terms of patents, licenses, and trademarks, and can leverage their globally recognized brands to differentiate their products beyond the reach and capabilities of local, smaller competitors. The low-end machinery market is largely dominated by SMEs, mainly due to their cost-cutting structures and price-based competition. Chinese SMEs of machinery are mainly clustered in and around Shanghai City, Shandong Province, Jiangsu Province, and Zhejiang Province.

As of 2016, China's growth is forecasted to continue to slow down through 2018 due to a variety of factors. The domestic Chinese stock market took a steep dive in "Black Monday" selloffs in 2015, and the effects on the Chinese financial system have had significant repercussions. China's government devalued the Yuan in August 2015, an indicator of growing concerns over slow growth. China's debt-to-GDP ratio stands at more than 240 percent, and has grown by 50 percentage points in the last four years alone.[i] For U.S. manufacturing technology exporters, the slowdown will likely cause a decline in sales in the short run, and the possibility of further Chinese government intervention to support local industry certainly exists.

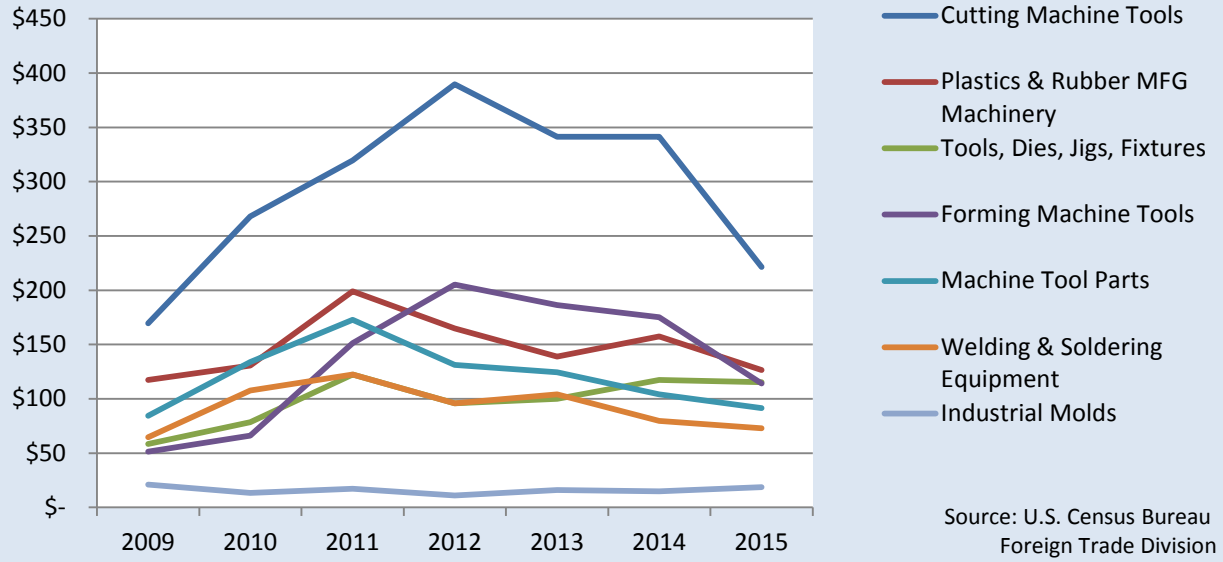
Export Overview

China is the largest global importer of metal-cutting and metal-forming machine tools, and in 2015 it was surpassed by Mexico as the leading U.S. export market for those products. Between 2009 and 2014, sales of U.S. cutting tools to China increased at an average annual rate (CAGR) of 15 percent. However, in 2015, sales plunged 35.2 percent for cutting tools, ending at $221 million, the lowest amount since 2009. Sales of forming tools also increased at the very robust rate of 27.8 percent (CAGR) between 2009 and 2014. However, by 2015 these numbers had dropped significantly to just above $114 million, almost 35 percent less than the year prior. While ITA does not expect sales to fall as rapidly in 2017, ITA expects continued decline in these subsectors through the short term. Nevertheless, China will remain an important market for U.S. tool makers in years to come.

China was also the third largest export market for U.S. products in two manufacturing technology subsectors. U.S. suppliers sold $72.7 million of welding and soldering equipment to China in 2015, down 8.5 percent from the year prior. U.S. exports in the subsector grew at a modest rate of 4.2 percent (CAGR) between 2009 and 2014, though ITA expects that exports will decline further through 2017.

Sales of machine tool parts for Chinese OEMs and for the after-market accounted for $91.4 million of U.S.

Figure 2: Annual U.S. Manufacturing Technology Exports to China, by Subsector (in USD millions)



Source: U.S. Census Bureau
Foreign Trade Division

exports in 2015. Annual sales of parts declined by 12 percent between 2014 and 2015, and total sales reached their lowest since 2009. China was the fourth largest export market in 2015 for U.S. mold makers, and the only product group to experience growth between 2014 and 2015. However, it is important to note the difference that exists between the second largest U.S. mold recipient, Canada, and the third, China. In 2014, China received roughly $18 million in industrial molds from U.S. suppliers, or roughly one-eighth the volume of the same products sold to Canada. As indicated in the Sector Snapshot, U.S. mold makers face stiff competition from low cost-of-labor markets like China and South Korea, and ITA expects sales of molds to China to decline in the near future.

China was the fourth largest export market for U.S. plastics and rubber working equipment. In 2015, U.S. suppliers of plastics and rubber working equipment sold $126 million of products to China, with finished machinery accounting for roughly two-thirds of that, and parts for the remaining third. In 2015, exports again saw their lowest performance since 2009, and ITA expects U.S. sales in this subsector will continue to fall through 2017.

The sale of tools, dies, jigs, and fixtures represent a relative bright spot in manufacturing technology

sales to China. In 2015, China was the 4th largest U.S. export market for this subsector, with $115 million of products sold. Despite heavy losses in other machinery sectors, sales of dies and tooling declined only 1.6 percent between 2014 and 2015. Exports in this category have grown at an average annual rate (CAGR) of 12 percent from 2009 to 2015. Part of this is due to the competitiveness of more customized and specialized products. While ITA expects the economic slowdown will act as an obstacle for future U.S. exports in this subsector, opportunities for custom tool and die jobs will remain through the near term.

China is a growing market for additive manufacturing equipment. As of 2014, Wohlers Associates estimates that China accounted for 9.2 percent of the world's installations of additive manufacturing equipment.[ii] Wohlers estimates that in 2014, China was the largest recipient of additive manufacturing equipment outside of the United States.

Challenges and Barriers

The U.S.-China trade relationship is one of the most significant and complex in the world, with multiple sources of tension. Despite implementing many free-market reforms over the past decades, China continues to maintain many state-driven economic policies that distort trade and investment in the manufacturing technology sector.

Of significant concern to U.S. companies is China's history of poor intellectual property rights (IPR) protection, which is well documented in the United

States Trade Representative's "Special 301" report. In this report, China has been placed in a priority category of offender countries every year since the report was first released in 1989. Of particular worry is the oft unchecked theft of trade secrets and industrial espionage conducted through cyber means by state-owned or affiliated enterprises. The U.S. Government will continue to press China to resolve these practices, but the outlook remains questionable for the foreseeable future.

A second set of challenges faced by U.S. companies in IPR-intensive industries are government requirements that compel rights holders to transfer IPR to local domestic entities. In these instances, central, provincial, or local governments may pressure rights holders to give up their IPR through incentives like tax subsidies or requirements that delay or deny market access if the IPR is not disclosed. In many cases, the cost of releasing ownership and the subsequent uncertainty created on the exporter may not be worth the market access.

China has revealed a number of economic policies that will likely pose challenges to U.S. exporters. "Made in China 2025" is a central government policy intended to comprehensively strengthen Chinese industry. It emphasizes 10 industries in particular to be strengthened, which, most notable to this report, includes "automated machine tools & robotics."[iii] The policy's goals are to emphasize high-quality, high-value added manufacturing in China and to raise the domestic content of core components and materials to 40 percent by 2020 and 70 percent by 2025. While there are indications that this policy will rely more upon free market institutions than previous initiatives, ITA is concerned that such goals may in fact be achieved through market-access barriers and other requirements to the detriment of U.S. exporters.

China's system of developing technical standards is generally at odds with the United States. Whereas U.S.-domiciled standards-developing organizations (SDOs) are generally driven by open, voluntary and consensus-based processes to promote efficiency and superior standards, Chinese SDOs reportedly often deny foreign parties the opportunity to participate in developing standards. Key members in SDOs are typically state-owned or state-affiliated entities, and therefore, may hasten the development of machinery standards that are favorable to the Chinese government rather than to the sector at large. The Chinese are in the process of considering changes to their standards system. ITA will continue to monitor these developments.

U.S. export controls and licensing remain a highly sensitive topic, although the magnitude of their impact on the competitiveness of U.S. manufacturers in China is disputed. China is the largest market for cutting machine tools in particular, a subsector to which many export controls apply. Although one report noted that export controls have not strongly impacted the dollar volume of U.S. machine tool exports to China, it also found that the export advantages afforded to Europeans by licensing processes that are often more swift or dependable are beginning to deeply hurt U.S. machine tool producers in the most advanced segments of the industry.[iv] For example, one major U.S. machine tool company reportedly no longer even offers five-axis equipment in the Chinese market as a result of the added difficulties required by submitting and following up on U.S. export licensing requirements. While it is generally understood within the industry that national security concerns dictate the Export Administration Regulations, some U.S. tool makers have expressed frustration at being beaten to sale by foreign competitors who experience lower average license processing times.[v] Some of these burdens may have been decreased by export control reform, which has been a multi-year, interagency effort that, at times, requires acts of the Congress to implement. It is, however, unlikely that significant reforms will be made in the machinery sectors in the foreseeable future. For more information on export controls and export licensing, contact the U.S. Department of Commerce Bureau of Industry and Security (BIS).[vi]

Know Your Buyer

Entering the Chinese market often relies heavily upon personal relationships developed and maintained at all levels of distribution. China provides permits for both trading (exporting/importing to and from China) and distribution (resale of imported goods within China), although companies may be authorized to do both. Many companies utilize multiple sales channels to overcome the sheer size and cultural diversity of the country.

Chinese companies are very price-conscious, which can affect after-sales service. Labor costs continue to be very low in China. Since the cost of maintaining service plans is often factored into machinery sales, it is important for exporters to consider this as they determine pricing. Some regions and municipalities may have requirements to provide localized after-sales service, which would either require on-site training, or require the local manufacturer representatives to be present.

National and Regional Trade Shows

ChinaPlas
April 25-28, 2016 – Shanghai, China
http://www.chinaplasonline.com/CPS16/Home/lang-eng/Information.aspx

China International Import Expo
May 19 - 21, 2016 — Kunshan Jiangsu, P.R.C.
http://www.importexpo.org/English/#

Die & Mold China
June 28 - July 1, 2016 — Shanghai New International Expo Center, Shanghai, China
http://www.cdmia.com.cn/sites/english/index.html

IMTEX 2017 - International Forming Technology Exhibition
January 22 - 28, 2017 – Bangalore, India
http://www.imtex.in/

TIMTOS Taipei International Machine Tool Show
March 7 - 12, 2017 – Taipei, Taiwan
https://www.timtos.com.tw

MTA — Manufacturing Technology Asia
April 4 - 7, 2017 — Singapore Expo, Singapore
http://mta-asia.com

CIMT 2017 - China International Machine Tool Show
April 17 - 22, 2017 – China International Exhibition Center, Bejing, China
http://www.cimtshow.com/indexen.jsp

[i] The Economist "Debt in China: Deleveraging delayed" 24 October, 2015. http://www.economist.com/news/finance-and-economics/21676837-credit-growth-still-outstripping-economic-growth-deleveraging-delayed

[ii] Tim Caffrey, Terry Wohlers "Wohlers Report 2015: 3D Printing and Additive Manufacturing State of the Industry" *Wohlers Associates, Inc.*, 2015. p. 30

[iii] Scott Kennedy "Made in China 2025" *Center for Strategic & International Studies,* 1 June 2015. http://csis.org/publication/made-china-2025

[iv] Richard Van Atta et. al., "Export Controls and the U.S. Defense Industrial Base: Impact of U.S. Export Controls on the U.S. Machine Tool Industry" *Institute for Defense Analyses,* January 2007, p. C-4 www.dtic.mil/cgi-bin/GetTRDoc?AD=ADA465592

[v] Jennifer Watts, Jason Bolton, Ashley Miller "Critical Technology Assessment of Five Axis Simultaneous Control Machine Tools" *U.S. Department of Commerce Bureau of Industry and Security,* July 2009. https://www.bis.doc.gov/index.php/forms-documents/doc_view/138-five-axis-simultaneous-control-machine-tools

[vi] http://www.bis.doc.gov/