WHITE PAPER

NAVIGATING THE CHALLENGES OF THE AMERICAN MARKET

The Evolving U.S. Role in Global Manufacturing

Lance A. Scott
Founder & CEO

Although the U.S. still ranks #1 in gross domestic product (GDP), manufacturing's contribution to GDP has declined considerably from 24.3% in 1970 to 12% in 2015. As U.S. consumers coveted inexpensive products and U.S. corporations focused on short-term profits, the economy witnessed a massive shift of high volume manufacturing to low cost regions (LCR). The U.S. consumers' desire for less expensive electronics, automobiles, and other technologies first led to a surge of imports from Japan and outsourcing to Mexico, but the transfer of high volume manufacturing later expanded to China, India, Vietnam, and elsewhere in Southeast Asia.

Figure 1: Location and quantity of U.S. manufacturing plants in China

Source: Robert South, American Association of Geographers

In fact, China has overtaken the U.S. in 2011 to become the world's largest producer of manufactured goods. According to the United Nations Conference on Trade and Development 2015 Report, China's manufacturing as a percent of national output stood at 27% - more than double the manufacturing contribution in the U.S.

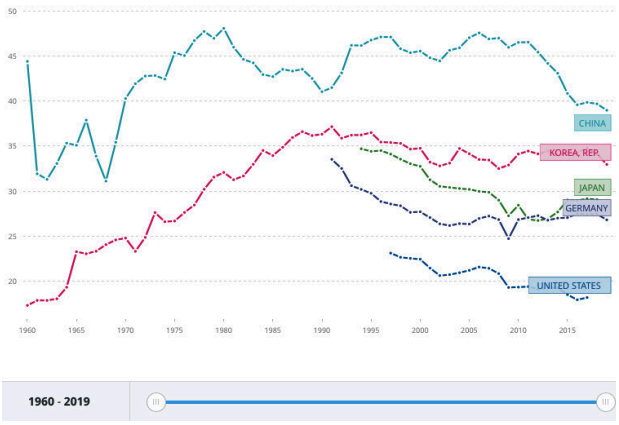
Figure 2: Global leaders on manufacturing output (2015)

Country	Manufacturing Output (USD in billions)	Percent of National Output	Percent of Global Manufacturing
China	$2,010	27%	20%
United States	1,867	12	18
Japan	1,063	19	10
Germany	700	23	7
South Korea	372	29	4
India	298	16	3
France	274	11	3
Italy	264	16	2
United Kingdom	244	10	2
Taiwan	185	31	2

Source: Brooking.edu and United Nations Conference on Trade and Development

Still, recent efforts to "reshore" manufacturing and embrace new advanced manufacturing technologies have emphasized the need to maintain U.S. technological leadership and strengthen efforts to protect intellectual property. Companies are learning to preserve low volume, high-mix production of these emerging technologies in North America, while shifting more mature high volume/low-mix production to LCR.

Figure 3: Manufacturing % of GDP (2016)



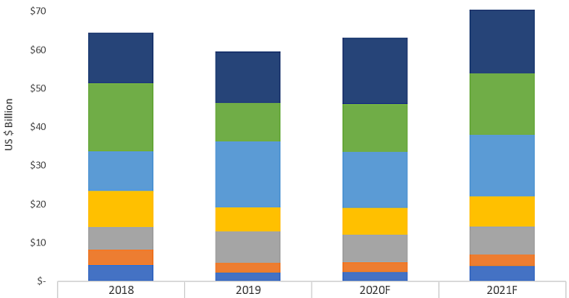
Source: The World Bank Group

Low Volume, High-Mix Production Remains in North America

The shift of high-volume, low-mix production to LCR is perhaps most recognizable in the textile industry. According to the United States Department of Agriculture (USDA), the U.S. lost more than 900,000 textile and apparel jobs to offshoring from 1994 to 2005 alone. Lower wages and new industrial production capacity in LCR drove many U.S. manufacturers to relocate or discontinue generations of textile production.

A similar scenario transpired in the printed circuit board (PCB) manufacturing industry, where a massive shift of high-volume, low-mix production of bare PCB shifted to LCR. The Asia-Pacific region now accounts for 77% of global PCB production and dominates this nearly $80 Billion manufacturing market. Several years later, the semiconductor manufacturing equipment market followed a similar path with 70% of the global equipment now being produced in Asia.

Figure 4: SEMI® Mid-Year Total Equipment Forecast by Region (2020)



	2018	2019	2020F	2021F
China	13.1	13.4	17.3	16.6
Korea	17.7	9.9	12.3	15.9
Taiwan	10.2	17.1	14.5	15.9
Japan	9.4	6.2	7.0	7.9
North America	5.8	8.1	7.1	7.3
SEA/ROW	4.0	2.5	2.6	3.0
Europe	4.2	2.3	2.4	3.9

Source: SEMI July 2020, Equipment Market Data Subscription

Still, U.S.-based manufacturers can benefit from the relentless trend toward new technologies, manufacturing techniques, and quality controls. According the SelectUSA, the U.S. employed 227,000 textile workers in 2017, and the country has seen a recent resurgence of capital investment and a 39% increase in exports from 2009-2015[1] partly due to cultural trends toward sustainable manufacturing and Made in America products.

The U.S. PCB and Semiconductor manufacturing industries have also maintained a strong position in low volume, high-mix production, with strong demand from the military and aerospace industries, and an increasing trend toward smaller feature sizes, higher layer count, and more complex manufacturing techniques.

U.S.-Based R&D and Engineering Design

Innovation is a cornerstone of America's reputation across a variety of markets, from semiconductors <link> to medical device and diagnostic imaging equipment <link>. Even for industries where the vast majority of manufacturing has been shifted to LCR, leading U.S. companies maintain substantial R&D and engineering resources in North America. It is essential for the U.S. offices of European manufacturers to stay in constant communication with these R&D and new product introduction (NPI) teams as they concentrate on next generation designs and select vendors.

As such, it is vital for international management teams to recognize the key role that U.S. sales teams perform in securing design wins and selection to approved vendor lists (AVL) that may result in volume production orders from manufacturing locations outside of the Americas. International communication, account management, and compensation schemes should be structured to reflect and reward these efforts.

Design Wins versus Sales Volume

One of the most common areas of misunderstanding between European management and their respective U.S. teams is the perceived mismatch between the enormous influence of U.S. engineers and supply chain managers of leading multinational OEMs and the comparatively low sales volume from the American operation for these very same customers. How can it be that the world's largest economy is not also the largest manufacturer and sales region?

The answer again lies with the shift in global manufacturing to LCR. Companies like Apple maintain a philosophy of "Designed by Apple in California, Assembled in China" for the vast majority of products, with much of the research, development and intellectual property remaining in the U.S. Data from research groups Counterpoint and IHS Markit report that Apple shipped 61 million iPhones to the U.S. in 2017, and the Foxconn factories that assemble most of the iPhones employs 230,000 workers. For a company manufacturing microprocessors, for instance, a design win by the U.S. sales team would yield virtually zero sales commission without a close coordination and compensation scheme that shares the rewards for massive purchase orders from Foxconn.

A similar story can be told for large multinational industrial manufacturers like Caterpillar as well. While the world leading producer of heavy equipment and related products once employed over 30,000 workers at its central Illinois manufacturing plants, Caterpillar now has more factories overseas, 76, than in the U.S., 62, with 25 plants in mainland China alone. Of course, this is partly due to a more decentralized approach to serve local markets, but it is critical to note that many of the core design decisions remain in the U.S.

This imbalance of design influence versus sales volume varies by industry, and advanced manufacturers seeking to accelerate growth in America should carefully analyze target markets and align expectations. While the U.S. represents nearly 50% of the global medical device manufacturing market, most European manufacturers would be shocked to learn that U.S. manufacturers only account for approximately 5% of global computer numeric control (CNC) machinery production[2].

Overcoming the Challenge

Understanding and adapting to the evolving global manufacturing landscape is essential to success in the Americas. Each company must carefully tailor its strategy based on company size, industry, product portfolio, and technical complexity to best address the challenges and opportunities of the U.S. market. Actionable tasks to improve outcomes include:

- Carefully research the specific markets, key participants, and U.S. manufacturing market share for each of the target industries, and establish realistic expectations for design wins and sales growth.
- Track international sales so that North American colleagues are motivated to engage in initial engineering/sales efforts and establish seamless global communication and account support.
- Place a heavy emphasis on engineering and technical support to demonstrate the value of responsiveness and communication with customers. An iterative design approach is essential during the product design phase.
- Implement a comprehensive, but easy to employ, key account management philosophy, new business opportunity (NBO) and related sales reporting system.

[1] Textile Industry Making a Comeback in the U.S. Southeast, Beth H. Land, Vice President, Site Selection Group http://www.areadevelopment.com/advanced-manufacturing/Q2-2017/textile-industry-making-comeback-in-US-southeast.shtml

[2] World Machine Tool Output and Consumption, Gardner Publications, Inc.

Alliance Technologies
SHU Verizon iHub
Welch College of Business & Technology
3135 Easton Turnpike
Fairfield, CT 06825
+1 203 226 8895