

## WHY HAVE U.S. FIRMS OFFSHORED TO CHINA?

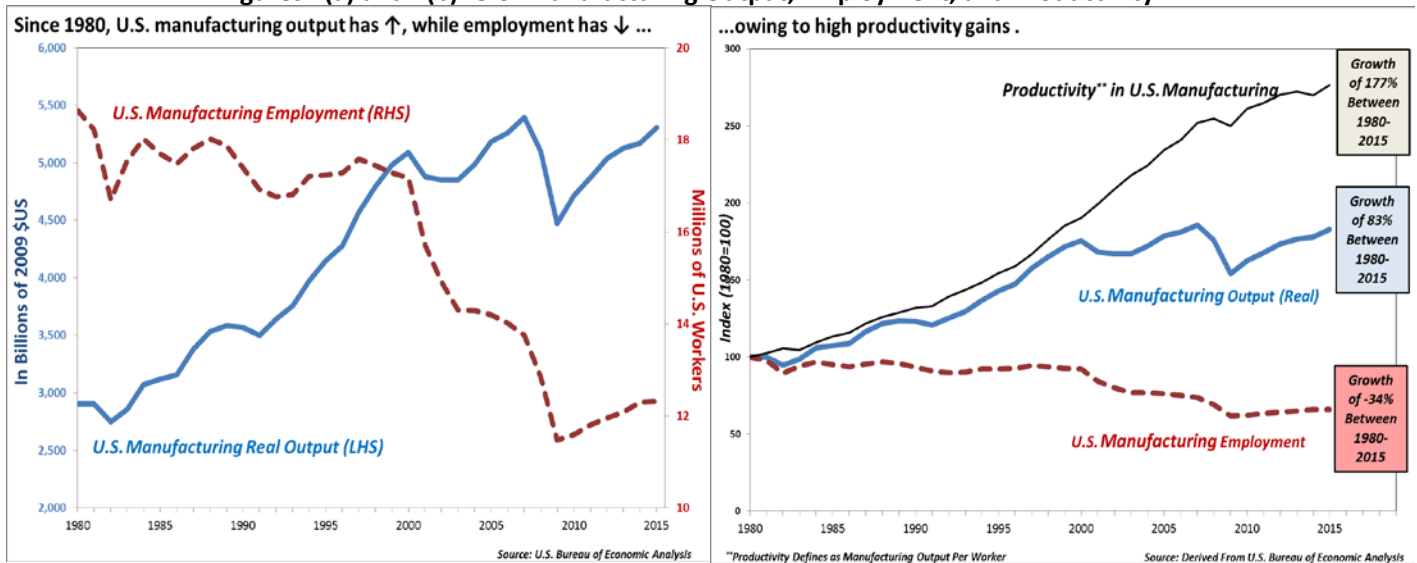
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*This briefing represents the first in a series of EBOTs on U.S. manufacturing offshoring. It describes why many U.S. firms have relocated production networks to China, the world’s largest manufacturing economy. As the U.S. economy has become increasingly dependent on the provision of services and the production of high-tech goods, many U.S. firms have offshored labor-intensive stages of their manufacturing process to China to benefit from cost differentials, operational advantages, better proximity to suppliers and a growing consumer base, and incentives. An accompanying briefing describes the size and composition of U.S. manufacturing offshoring to China.<sup>1</sup>*

**The U.S. Economy’s Increasing Reliance on Services.** After WWII, U.S. manufacturing accounted for 39% of U.S. GDP, which was close in magnitude to the size of the service sector, 44% of GDP. By 2015, manufacturing constituted only 19% of all U.S. economic activity, while the U.S. service sector had grown to 77%. This structural change in the economy –which also occurred in most advanced economies– was not a result of a slowdown in overall U.S. manufacturing. Rather, it was mainly attributable to faster growth in many services sectors, including professional and business services as well as finance, insurance, real estate services.

**U.S. Manufacturing Output Is Still Growing Despite Fewer Jobs.** While U.S. manufacturing growth has not kept pace with that of the service sector, it has not been stagnant either. From 1980 to 2015, real manufacturing output grew by 83% despite a concurrent 34% drop in manufacturing employment (Figure 1). By 2016, the 12.3 million U.S. manufacturing workers represented 8% of the workforce, down from 18% in the 1980s.

**Figures 1(a) and 1(b): U.S. Manufacturing Output, Employment, and Productivity**



**Productivity Gains in Manufacturing Explain Diverging Trends Between Output and Employment.** The productivity growth in manufacturing associated with greater output from fewer workers (Figure 1b) was led by the high-tech computers/electronics sector, which grew by 7.8% per annum in real terms since 1980. As production in that capital-intensive sector became increasingly dependent on automation<sup>2</sup>, many high-tech firms with small, specialized, and high-paid staff have often found it more profitable to remain in the United States and not risk their high productivity levels and intellectual-property related trade secrets. By contrast, firms in labor-intensive sectors, or with labor-intensive production stages, have often found it profitable to offshore to low-wage countries. Many such firms that remained in the United States, including those in the apparel/textiles and low-tech electronics sectors, exhibited low to negative growth in output since 1980, as cheaper imports from China and developing countries gradually began filling U.S. domestic demand.

<sup>1</sup> See Hammer, “The Size and Composition of U.S. Manufacturing Offshoring to China” (Forthcoming).

<sup>2</sup> Industrial robots and automation depend on capital-intensive processes, such as additive manufacturing, advanced design, digital connections, materials science and biotechnology, and energy production. Baily and Bosworth, *Journal of Economic Perspective*, Winter 2014.

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**Manufacturing Cost Differentials Between the U.S. and China Have Motivated Much of the Offshoring.**

Much of the economic and industry literature identifies manufacturing cost differentials as the leading reason to offshore, with labor and indirect costs (e.g. overhead) accounting for the vast majority of the differences (Figure 2). The U.S. Bureau of Labor Statistics provides recent, data, showing manufacturing wages in China as considerably lower than any other major U.S. trading partner (Figure 3), or just 11% of what was paid in the U.S. in 2013 for comparable work. More recent studies show that Chinese manufacturing wages are between 10-25% of U.S. wages for comparable work.<sup>3</sup> While the magnitude of these wage differentials is large, it is offset, in part, by U.S. labor productivity advantages.

Despite the wage differentials, Chinese wages are growing fast due to rising domestic job scarcity, higher productivity, and higher costs of living. Such wage increases have led some Chinese manufacturing firms to move to Vietnam, Indonesia, the Philippines, Mexico, and back to the United States (reshoring), and automate a greater share of their manufacturing.<sup>4</sup>

**Flexible Hiring, Scalability Options, and Intra-Firm Trading**

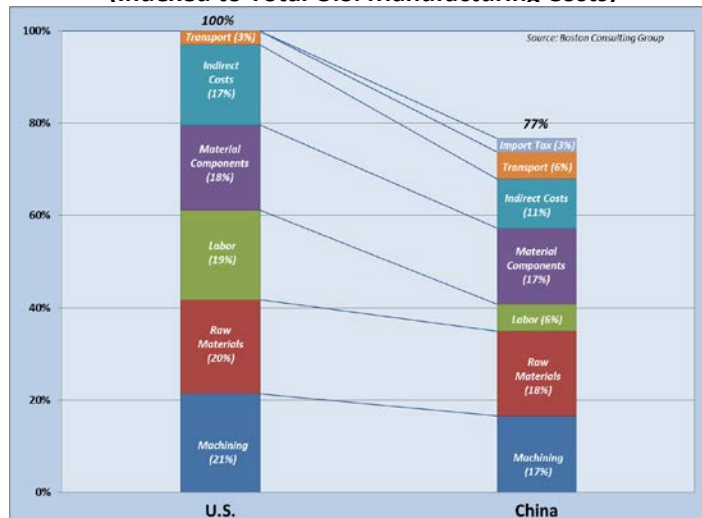
In addition to maintaining a high degree of flexibility in hiring workers and managers,<sup>5</sup> China's rapidly growing manufacturing sector has been flexible in production (as measured by factor mobility<sup>6</sup> within China). This flexibility has allowed U.S.-owned manufacturers to quickly increase production in China when needed, and benefit from economies of scale. It has also allowed U.S. parent companies to lower per-unit costs of intermediary inputs from China, which their U.S. affiliates in China often supply. According to the BEA, U.S. parent firms imported \$34 billion of manufactured goods from affiliates of U.S. multinationals in China between 2009 and 2014, though how much was imported from affiliated parties is less clear.

**Proximity to Global Supply Chains and Growth Markets.**

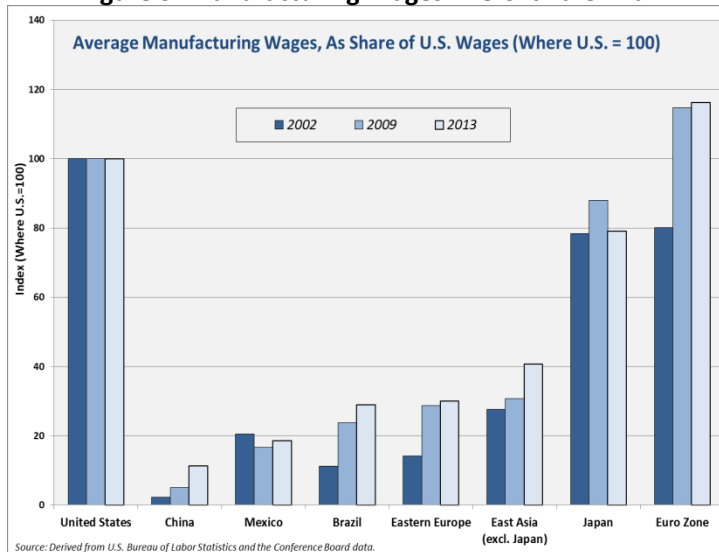
Many multinational firms have also sought to bring their production lines closer to their supply networks<sup>7</sup> and a growing Chinese consumer base. According to the BEA, in 2014, sales by U.S.-owned manufacturing affiliates in China exceeded \$204 billion to the local market.<sup>8</sup> Computer and electronics (e.g., semiconductors) accounted for the largest share of these sales (34%).

**Other.** China's post-2001 WTO accession tariff reductions, improving customs procedures, low transportation costs, and infrastructure enhancement have also influenced multinationals to offshore to China. Firms have also been encouraged by policies (e.g., lower taxes, grants, land-use rights, R&D support) and "incentives transfers" which exchange market access for technology and greater use of local content in manufacturing.<sup>9</sup>

**Figure 2: Manufacturing Costs in U.S. vs. China, 2008 (Indexed to Total U.S. Manufacturing Costs)**



**Figure 3: Manufacturing Wages in U.S. and China**



<sup>3</sup> Deloitte, "Global Manufacturing Competitiveness Index Report" (2016) and *The Economist*, "A Tightening Grip," Mar 12, 2015.  
<sup>4</sup> Financial Times, "China's Robot Revolution," June 6, 2016.  
<sup>5</sup> Apple, Inc. took 15 days in China (compared to 9 months in the U.S.) to hire 8,700 managing engineers. VentureBeat, "iPhone Manufacturing", Jul 2013.  
<sup>6</sup> World Bank, World Development Report: Reshaping Economic Geography, 2009.  
<sup>7</sup> Baldwin, "Global Supply Chains: Why They Emerged, Matter, Where They Are Going", *Global Value Chains in a Changing World*, WTO, 2013.  
<sup>8</sup> U.S. Bureau of Economic Analysis, "Activities of Majority-owned Foreign Affiliates of U.S. Multinational Enterprises – China" database.  
<sup>9</sup> China Business Review, "Foreign Company R&D: In China, For China," June 1, 2015; and STC, "Phenomenon of Technology Transfer", Nov 30, 2016.