

# The Linkage between Services and Manufacturing in the U.S. Economy<sup>1</sup>

Observers have traditionally framed manufacturing in terms of the physical output of consumer and capital goods, equipment, and machinery. However, this perspective is on course to shift with the growing realization of services' role in each stage of the manufacturing process. Services enable U.S. manufacturers to become more efficient and competitive, and increase production value and profitability. The rising and inescapable integration between services and manufacturing—a key linkage to ensure the continued global success of U.S. manufacturers.

➤ **Services mean that manufacturing is more productive.**

- Services have enabled manufacturers to become more competitive as a result of cutting-edge technologies.
- Services that are bundled with manufactured goods contribute to the final value of the product, either as inputs “embodied” during the production process (e.g. energy, transport, communications, insurance, accountancy, consulting, design, advertising/ marketing, warehousing, software, legal and other professional expertise) or “embedded” at the point of merchandise sale (e.g. financing, training, maintenance, and after-sales services).
- “Servicification” has been coined to describes the increasing use of services by manufacturing firms in their purchases and production and exports, reflecting the integrated role that services play throughout the process.
- Up to 60 percent of employment in manufacturing firms is found in service support functions, like engineering, transportation, marketing, and IT.

➤ **The importance of services in manufacturing output is growing.**

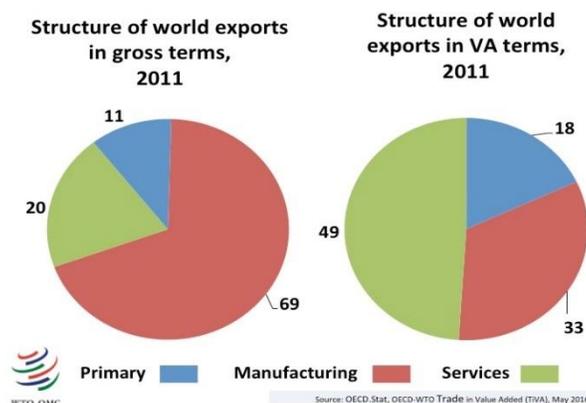
- Three key drivers of the increased use of services by manufacturing firms include increased geographic spread of supply chains; the need to cut costs and improve efficiency; and the desire to deepen and improve customer relationships by providing services related to manufacturers' products.
- Over 50 percent of the average cost of manufacturing an automobile is derived from services, and more than 50 percent of the Apple iPod's value is based solely on services activities.
- A study of 80 multinational manufacturing companies from all sectors showed that while services represented on average 25 percent of revenue for these companies, they constituted as much as 46 percent of the profits.
- Between 25 and 60 percent of employment in manufacturing firms is found in service support functions such as R&D, engineering, transport, logistics, distribution, marketing, sales, after-sales service, IT, management and back office support.

➤ **Services bundled in traded manufactured products is growing.**

- As calculated through the OECD and WTO's new database on trade in value-added, we can now see the “value” contributed by services to intermediate and final merchandise goods (*see below*).
- Services are a critically important component of U.S. trade, with over one-third (34 percent) of total U.S. exports made up of services (as measured on a gross statistical basis). However, when considering the value of the numerous services embodied in the production of goods as described above, services represented 50 percent of total U.S. exports and supported 4.2 million jobs in the United States in 2013.

➤ **Services and data flows improve manufacturing production efficiency.**

- The fourth industrial revolution is upon us, with the emergence of the digital economy and data flows.
- Digital services provide 25 percent of total input of manufacturing, empowering improvements in efficiency through smart technologies.
- Cross-border data flows, which underpin the digital world, grew by 45 times between 2005 and 2014 and generated \$2.8 trillion in economic value in 2014, contributing more to world GDP than global trade in goods.
- For manufacturing firms to become integrated services providers and move into ‘smart’ manufacturing, the free flow of cross-border data as guaranteed in international trade agreements are necessary.
- Manufacturing will continue its paradigm shift towards producing ‘smart’ products through integrating high-tech and high quality services.



<sup>1</sup>Based on the 2017 paper by Sherry Stephenson, ICTSD