

# China's Manufacturing Sector, Industrialization and Economic Globalization

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**Abstract:** *By analyzing the development and industrialization of China's manufacturing industry since reform and opening-up, this paper proposes China has played three roles in economic globalization- as an in-depth participant in specialization of the global manufacturing value chain, as an active facilitator of global inclusive and sustainable industrialization, and as a cooperative innovator in the new industrial revolution. It is significant for comprehensively understanding the role of China in economic globalization.*

**Keywords:** *manufacturing industry, industrialization, globalization, roles*

JEL classification code: L60, O14

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Since reform and opening-up, China's manufacturing industry has been developing rapidly and advancing industrialization fast. The development and industrialization of China's manufacturing industry has a close bearing on economic globalization. China gives full play to its comparative advantages, actively participating in specialization of the global manufacturing value chain, and contributing to global economic growth and economic globalization while promoting the development and industrialization of its own manufacturing industry. In light of the development and industrialization of its manufacturing industry, China plays three roles in economic globalization, namely, as a deep participant in specialization of the global manufacturing value chain, as an active facilitator of global inclusive and sustainable industrialization, and as a cooperative innovator in the new industrial revolution.

## 1. Deep Participant in Specialization of the Global Manufacturing Value Chain

Since reform and opening-up, China's manufacturing industry has taken the lead in opening up to the outside world. Since China's entry into the WTO in 2001, the manufacturing industry has been an active participant in economic globalization and has been developing rapidly based on demographic dividend and comparative advantages. China has become a world factory with the world's largest output since 2010. "Made in China" is found in over 230 countries and regions around the world. China is the only country with manufacturing capacity in all industrial sectors, and more than 220 of the 500 main industrial products in China rank first in the world by output.<sup>1</sup> As shown in Figure 1, according to statistics of the United Nations Statistics Division, China's manufacturing value added reached US\$3079.895 billion in 2016, representing a 24.5% share in the world, surpassing that of the United States, which came second with US\$2183 billion,

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<sup>1</sup> Wei Jigang (2015, May 5). *China's Medium- and Long-term Industrial Development Strategy*. China Economic Times.

# 中国的制造业发展与工业化进程:全球化中的角色

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**摘要:** 本文基于对改革开放以来中国制造业发展和工业化进程的分析, 提出中国在经济全球化进程中承担了三个角色, 全球制造业价值链分工的深度参与者, 全球包容可持续工业化的积极促进者, 共同迎接全球新工业革命合作创新者, 对全面认识中国在经济全球化中的作用具有重要意义。

**关键词:** 制造业; 工业化; 全球化; 角色

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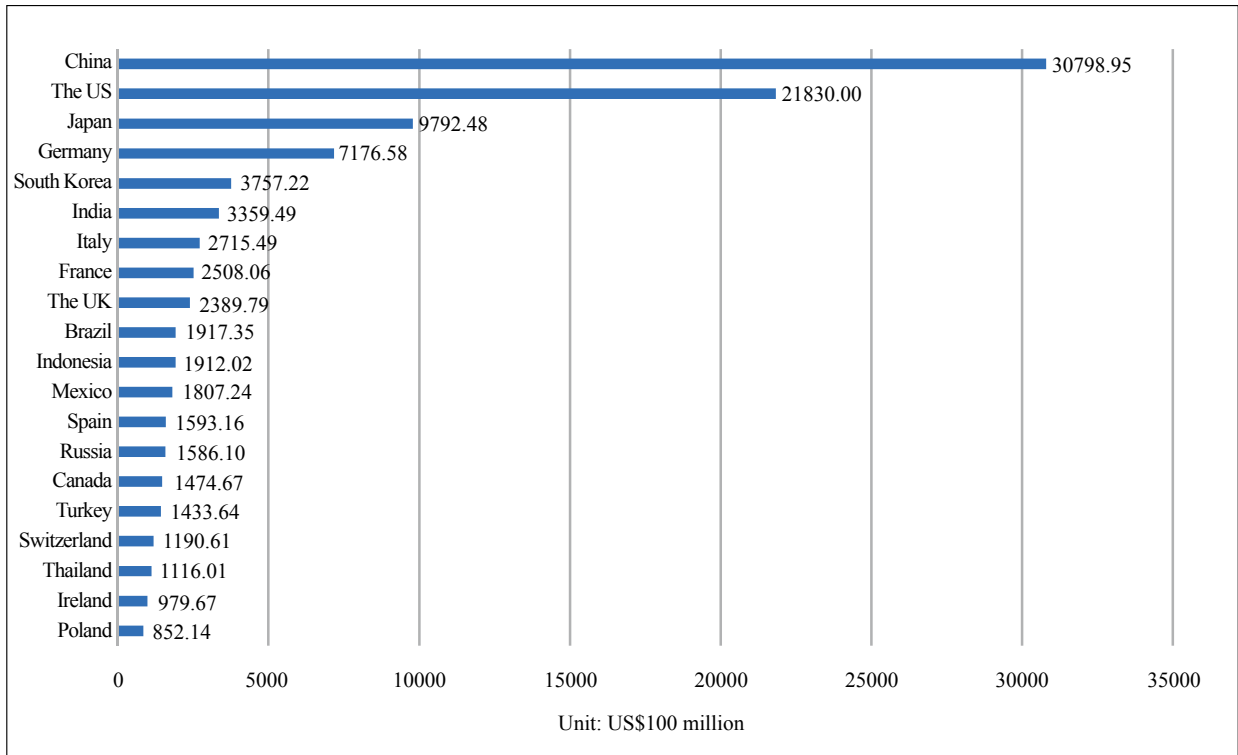
改革开放以来中国制造业快速发展, 迅速推进了工业化进程。中国的制造业发展与工业化进程与经济全球化进程密切相关, 中国充分发挥了自己的比较优势, 积极参与了全球制造业价值链分工, 在促进自身制造业发展和工业化进程同时, 也为世界经济增长和经济全球化进程做出了自己的贡献。从中国制造业发展和工业化进程角度看, 中国在经济全球化进程中可以认为承担了三个角色, 深度参与者——深度参与全球制造业价值链分工, 积极促进者——积极促进了全球包容可持续工业化, 合作创新者——合作创新共同迎接全球新工业革命。

## 一、深度参与者: 深度参与全球制造业价值链分工

改革开放以来, 中国制造业率先踏上对外开放之路。在2001年进入WTO后, 中国制造业积极融入经济全球化进程中, 依靠“人口红利”和比较优势, 制造业迅速发展。在2010年以后中国就成为世界产出第一的制造大国, 成为真正的“世界工厂”, 世界230多个国家和地区都能见到中国制造的身影, 在联合国工业大类目录中, 中国是唯一拥有所有工业门类制造能力的国家, 现在我国500种主要工业品中有220多种产量位居全球第一。<sup>1</sup>如图1所示, 据联合国统计局数据库数据, 到2016年, 中国是制造业增加值达到30798.95亿美元, 占世界比重达到24.5%, 比世界第二位美国制造业增加值21830亿美元多出了近万亿美元, 几乎是世界第二位美国 and 第三位日本制造业增加值的总和。

随着中国制造业深度融入全球制造业价值链, 世界制造的版图发生了比较大的变化。总体而言, 高收入

<sup>1</sup> 魏际刚: 《中国产业中长期发展战略问题》, 《中国经济时报》, 2015年5月5日。



**Figure 1: Manufacturing Value Added of Major Countries in 2016**

Source: Database of United Nations Statistics Division

by nearly a trillion dollars, and almost equal to the second and third countries, the US and Japan, combined.

As China's manufacturing industry has been becoming more deeply involved in the global manufacturing value chain, the world's manufacturing landscape has changed greatly. In general, high-income countries still account for about 60% of global manufacturing value added, but the share has been decreasing in the past 20 years, which has a lot to do with Asia, especially China. China's share of global manufacturing value added was negligible in 1970 but rose to one-fourth in 2016.<sup>2</sup> In 1984, the US accounted for as much as 29% of global manufacturing value added, but after ups and downs, it fell to 17.3% in 2016. As for Japan, its share declined from a peak of 21.5% in the 1990s to 7.7% in 2016.

The global manufacturing industry can be divided into three networks, the North American free trade area with the US, Canada and Mexico at the center, the European Union region with Germany, France, the Netherlands and Italy at the center, and the East Asian region with China, Japan and South Korea at the center. According to statistics of the International Trade Center, the proportion of the East Asian region in global exports of manufactured goods increased from 28.11% in 2008 to 32.47% in 2016. In 2016, China accounted for 13.2% of the world's exports, exceeding Japan and South Korea combined, and for 9.9% of the world's imports, which suggests China's imports and exports have a huge influence on the global manufacturing value chain. In terms of geographical extension, the average distance between China and destination countries is 6407 kilometers and the average distance between China and supplying countries is 6153 kilometers, both exceeding Japan (6116 kilometers and 6107 kilometers respectively) and South Korea (5351 kilometers and 5504 kilometers),<sup>3</sup> which shows that the

<sup>2</sup> Mary Hallward-Driemeier & Gaurav Nayyar. (2018). *Everchanging Global Manufacturing Landscape: 12 Facts*. China Economic Report, Issue 4.

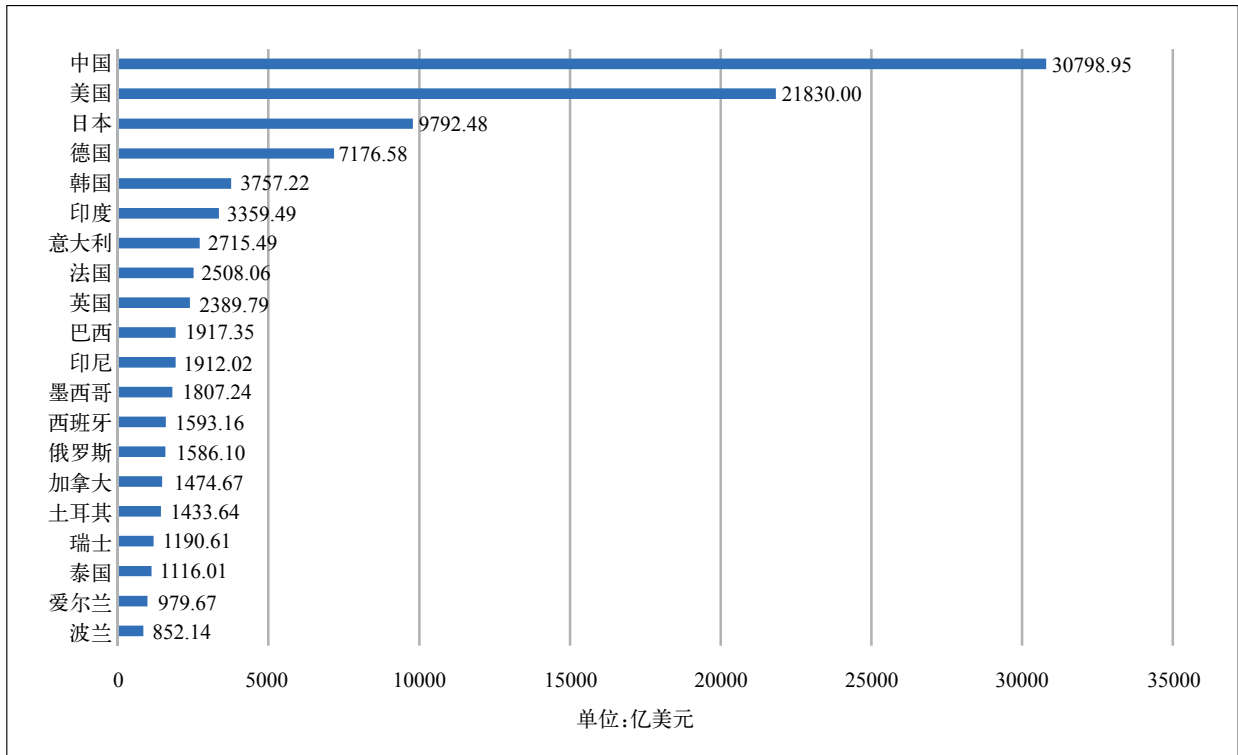


图1 2016年世界主要国家制造业增加值

资料来源:联合国统计司数据库。

国家仍占据世界制造业增加值大约60%比例,但是近20年高收入国家制造业增加值比重在不断下降,在很大程度上与亚洲特别是中国相关。中国占全球制造业增加值的比重从1970年的可忽略不计上升到2016年的占据全球四分之一。<sup>2</sup>在1984年,美国制造业增加值占世界比例曾达到过29%,几经起伏,2016年美国制造业增加值占全球制造业比例降低到17.3%;日本在20世纪90年代制造业增加值占全球制造业增加值比例达到21.5%的峰值,到2016年,该比例降低到7.7%。

全球制造网络看,世界制造业可以分为三大网络,以美国、加拿大和墨西哥为核心的北美自由贸易区,以德国、法国、荷兰、意大利为核心的欧盟区,以及以中国、日本和韩国为核心的东亚地区。根据国际贸易中心数据,东亚地区网络制造业商品出口额占世界比重从2008年28.11%上升到2016年的32.47%,其中中国出口额占世界比重2016年13.2%,超过了日本和韩国之和,中国进口额占世界份额9.9%。这表明中国进出口对世界制造业价值链的影响巨大。尤其是中国制造业商品出口目的地的平均距离为6407公里,与产品供应国平均距离6153公里,这两个物理距离都超过日本(分别为6116公里和6107公里,)和韩国(分别是5351公里和5504公里),<sup>3</sup>这表明中国制造业供应链覆盖全球程度高于日本,更是远高于韩国。

<sup>2</sup> 玛丽·霍尔沃德-德里梅尔 (Mary Hallward-Driemeier)、高拉夫·纳亚尔 (Gaurav Nayyar):《不断变化的全球制造业格局:12个事实》,《中国经济报告》,2018年第04期。

<sup>3</sup> 李娣:《全球三大生产网络比较研究》,《全球化》,2018年第9期。

global coverage of China's manufacturing value chain is greater than that of Japan and even greater than that of South Korea, and reflects the degree of internationalization of China's manufacturing industry and the depth of its integration into the global value chain.

China's active participation in the global manufacturing value chain is reflected not only in exports but also in opening-up to the outside world. Of the 31 divisions, 179 groups and 609 classes of the manufacturing industry, China has opened 22 divisions, 167 groups and 585 classes to foreign capital, and the opening has been further expanded since 2018. In 2017 and 2018 respectively, 4986 and 6152 foreign-invested manufacturing enterprises were established in China, and US\$33.5 billion and US\$41.17 billion of foreign capital were used in the manufacturing industry. In recent years, nearly 2000 multinationals have set up regional headquarters and R&D centers in China. The open Chinese manufacturing industry benefits from foreign capital, technology and talent input and continuously offers handsome returns to foreign-invested enterprises. According to statistics of the China Association of Automobile Manufacturers, 23,709,800 passenger cars were sold in China in 2018, including 5,080,500 German cars, 4,446,300 Japanese cars, 2,477,900 American cars, 1,180,500 South Korean cars and 307,000 French cars, which represented 21.43%, 18.75%, 10.45%, 4.98% and 1.29%, respectively, of the total sales, accounting for nearly 60% of the market.

## 2. Active Facilitator of Global Inclusive and Sustainable Industrialization

Since reform and opening-up, against the background of economic globalization and accompanied by the opening-up and rapid development of the manufacturing industry, China has advanced industrialization quickly. According to industrialization theories, the process of industrialization can be divided into pre-industrialization, early stage, middle stage, later stage and post-industrialization. In light of the composite index of the industrialization level (per capita GDP, output value ratio of primary industry, secondary industry and tertiary industry, proportion of manufacturing value added in gross merchandise value added, population urbanization rate, and employment rate of primary industry), according to our estimation, China entered the later stage of industrialization in 2015 and will have basically realized industrialization by 2020 (see Table 1).<sup>4</sup> A developing country with a population of over a billion, China has advanced industrialization from the early stage to the later stage in only decades and then has substantially reduced poverty. It is an unprecedented miracle in the industrialization history of mankind and is a tremendous contribution to global industrialization as it increases the inclusiveness of global industrialization.

Moreover, under the Belt and Road Initiative, China's industrialization will make a greater contribution to inclusive and sustained industrialization around the world.<sup>5</sup> As the Belt and Road Initiative advances, the contribution of China's industrialization, which is in the later stage of industrialization, will no longer stay at the level of the export of low-cost products in global value chain specialization, but will be embodied in the international flow of capital, technology and labor force, that is, international production capacity cooperation. Production capacity cooperation means transnational or transregional allocation of production capacity resources between two or more countries or regions with such willingness and needs. It generally includes enterprise and project cooperation based on industrial complementarity through a multilateral investment mechanism on the premise of a consensus on connectivity and multilateral cooperation between governments. In light of existing cases of cooperation between China and countries along the Belt and Road, the cooperation projects are mostly infrastructure investments of great strategic importance that make a great contribution to people's livelihood. From the perspective of industrialization, the Belt and Road Initiative shows that the industrialization of

<sup>3</sup> Li Di. (2018). *Comparative Research on the World's Top 3 Production Networks*. Globalization, Issue 9.

<sup>4</sup> Huang Qunhui, et al. (2017). *China Industrialization Report (1995-2015)*. Social Sciences Academic Press, 47.

<sup>5</sup> Huang Qunhui. (2017). *Influence of China's Industrialization on Globalization*. China Industrial Economics, Issue 6.

中国制造业积极参与全球价值链,并不仅仅体现在对外出口,更体现中国制造业对外开放。在制造业31个大类、179个中类和609个小类中,中国完全对外资开放的已有22个大类、167个中类和585个小类,2018年以来开放的类别进一步扩大。2017年和2018年在中国新设立制造业外商投资企业4986家和6152家,制造业领域实际利用外资达335亿美元和411.7亿美元,近些年在中国设立区域总部、研发中心的跨国公司近2000家。开放的中国制造业受益于国外资本、技术和人才的投入,也持续为外资企业提供了良好回报。根据中国汽车工业协会数据,2018年乘用车共销售2370.98万辆,其中,德系、日系、美系、韩系和法系乘用车分别销售508.05万辆、444.63万辆、247.79万辆、118.05万辆和30.70万辆,分别占乘用车销售总量的21.43%、18.75%、10.45%、4.98%和1.29%,市场占有率接近60%。

## 二、积极促进者:积极促进全球包容可持续工业化

改革开放以来,在经济全球化背景下,随着制造业的对外开放和迅速发展,中国快速地推进了工业化进程。按照工业化理论,可以把工业化进程划分为前工业化、工业化初期、工业化中期、工业化后期和后工业化阶段。从工业化水平综合指数(包括人均GDP、三次产业产值比例、制造业增加值占总商品增加值比例、人口城市化率、第一产业就业占总体就业比重5个指标的综合评价)看,根据我们的测算,2015年,中国总体上进入工业化后期,到2020年中国也将基本实现工业化(如表1所示)。<sup>4</sup>一个拥有十几亿人口的发展中大国,用短短几十年时间将工业化从初期推进到后期,进而大幅缩减了贫困人口,这是人类工业化史上前所未有的奇迹,这本身就是对全球工业化进程巨大贡献,提高了全球工业化包容性。

不仅如此,“一带一路”倡议下中国工业化进程将对全球包容可持续工业化做出更多贡献。<sup>5</sup>随着“一带一路”推进,已经步入工业化后期的中国工业化对经济全球化的贡献将不仅仅主要停留在基于中低价值链环节的全球分工格局下的低成本产品出口,而是将会表现为资本、技术和劳动力等生产要素的全面的国际流动,也就是产能的国际合作。所谓产能合作可以理解为在两个或者多个存在意愿和需要的国家或地区之间进行产能资源跨国或者跨地区配置的活动。产能合作的合作机制一般表现为在政府达成“互联互通”、多边合作共识国际规则的前提下,借助多边投资机制,基于产业互补性推进的企业和项目合作。从现有的中国与“一带一路”沿线国家合作的案例看,合作项目多是具有基础设施投资性质的、对民生有巨大贡献的重大战略性意义的工程。从工业化视角看,“一带一路”战略的推出,表明一个和平崛起的大国的工业化进程正在产生更大的经济全球化“溢出效应”。在联合国在《变革我们的世界:2030年可持续发展议程》,将促进包容和可持续性的工业发展做为第九项目标提出。中国的工业化进程在“一带一路”倡议下,通过产能合作可以有助于推进“一带一路”国家的包容和可持续性的工业发展。

基于最初倡议,“一带一路”沿线国家至少涉及包括东南亚、中亚、中东欧等地区的65个国家(中国包括在内),覆盖约44亿人口,经济总量约21万亿美元,人口和经济总量分别占全球的63%和29%。如表2所示,我们研

<sup>4</sup> 黄群慧等:《中国工业化进程报告(1995—2015)》,第47页,社会科学文献出版社,2017年。

<sup>5</sup> 黄群慧:《中国工业化进程及其对全球化的影响》,《中国工业经济》,2017年第6期。



**Table 1: China's Index of Industrialization Level in 2015**

Stage		Nation	Four plates	Nine regions	31 Provinces, municipalities, autonomous regions
Post-industrialization (V)					Beijing, Shanghai, Tianjin
Later-stage of industrialization (IV)	Second half	Nation (84)	East (95)	Yangtze River Delta (98), Pearl River Delta (96), Beijing-Tianjin-Hebei (93) Bohai Rim (92), Yangtze River Economic Zone (85)	Zhejiang (97), Jiangsu (96), Guangdong (96), Liaoning (91), Fujian (91), Chongqing (88), Shandong (88)
	First half		Northeast(76) Middle (71)	Heilongjiang, Jilin, Liaoning (76) Six provinces in Central China (71)	Hubei (76), Inner Mongolia (75), Jilin (75), Hebei (70), Jiangxi (70), Hunan (70), Shaanxi (69), Anhui (69), Henan (66)
Middle-stage of industrialization (III)	Second half		West (58)	Northwest China (58) Southwest China (58)	Sichuan (64), Qinghai (62), Ningxia (58), Guangxi (58), Shanxi (57), Heilongjiang (53)
	First half				Tibet (47), Xinjiang (44), Gansu (43), Hainan (42), Yunnan (41), Guizhou (39)
Early-stage of industrialization (II)	Second half				
	First half				
Pre-industrialization (I)					

Note: The numbers in parentheses are corresponding composite indexes of industrialization level.

Source: Huang Qunhui, et al. (2017). China Industrialization Report (1995-2015). Social Sciences Academic Press, 47.

a peacefully rising China is producing the greater spillover effect of economic globalization. The United Nations proposes the promotion of inclusive and sustained industrialization as the ninth goal in *Transforming Our World: the 2030 Agenda for Sustainable Development*. Under the Belt and Road Initiative, China's industrialization is conducive to the inclusive and sustained industrialization of countries along the Belt and Road through production capacity cooperation.

The original initiative involves at least 65 countries (including China) along the Belt and Road in Southeast Asia, Central Asia, and Central and Eastern Europe that cover a population of about 4.4 billion and an economic aggregate of about US\$21 trillion, representing 63% and 29%, respectively, of the world's total. As shown in Table 2, the level of industrialization varies greatly among the 65 countries along the Belt and Road. Only one country is in the pre-industrialization stage, 14 are in the early stage of industrialization, 16 are in the middle stage, 32 are in the later stage, and only two are in the post-industrialization stage. Fourteen countries have a higher industrialization level than China, and 44 have a lower industrialization level. China's industrialization is advanced among the countries along the Belt and Road.<sup>6</sup> Countries along the Belt and Road, at different stages of industrialization and with different levels of economic development, form a gradient with different advantageous industries, i.e. countries dominated by technology-intensive and high-added-value industries (countries in the later stage of industrialization), countries dominated by capital-intensive industries (countries in the middle stage of industrialization) and countries dominated by labor-intensive industries (countries in the

<sup>6</sup> Huang Qunhui, et al. (2015). *Report on Industrialization of Countries along the Belt and Road*. Social Sciences Academic Press, 14-15.

表1 2015年中国工业化水平指数

阶段		全国	四大板块	九大区域	31省市区
后工业化阶段(五)					北京、上海、天津
工业化后期(四)	后半阶段	全国(84)	东部(95)	长三角(98)、珠三角(96)、京津冀(93)、环渤海(92)、长江经济带(85)	浙江(97)、江苏(96)、广东(96)、辽宁(91)、福建(91)、重庆(88)、山东(88)
	前半阶段		东北(76) 中部(71)	东三省(76) 中部六省(71)	湖北(76)、内蒙古(75)、吉林(75)、河北(70)、江西(70)、湖南(70)、陕西(69)、安徽(69)、河南(66)
工业化中期(三)	后半阶段		西部(58)	大西北(58) 大西南(58)	四川(64)、青海(62)、宁夏(58)、广西(58)、山西(57)、黑龙江(53)
	前半阶段				西藏(47)、新疆(44)、甘肃(43)、海南(42)、云南(41)、贵州(39)
工业化初期(二)	后半阶段				
	前半阶段				
前工业化阶段(一)					

注:括号中的数字为相应的工业化综合指数。

资料来源:黄群慧、李芳芳等:《中国工业化进程报告(1995~2015)》,第47页,社会科学文献出版社,2017。

究表明,“一带一路”沿线有65个国家,这些国家之间工业化水平差距较大,处于前工业化时期的国家只有1个,处于工业化初期阶段的国家有14个,处于工业化中期阶段的国家有16个,处于工业化后期阶段的国家有32个,而处于后工业化时期的国家只有2个。有14个国家的工业化水平高于中国,有44个国家的工业化水平低于中国。中国在“一带一路”沿线国家中工业化水平处于上游的位置。<sup>6</sup>“一带一路”沿线国家处于不同的工业化阶段,具有不同的经济发展水平,并形成了不同的优势产业类型梯度,即技术密集与高附加值产业(工业化后期国家)主导、资本密集型产业(工业化中期国家)主导、劳动密集型产业(工业化初期国家)主导。这就决定了不同类型产业之间的互补性很强,从而中国与这些国家的产能合作空间巨大。通过产能合作,中国将会促进“一带一路”国家产业升级、经济发展和工业化水平的进一步提升,这对包容可持续的世界工业化进程的推进意义巨大。在“一带一路”倡议下,通过合作可以实现让不同发展水平的国家获得更多平等发展的权利,让基础设施落后的国家加快打通发展的通道,让产业基础薄弱的国家找到了更广合作发展的途径,让不同经济体制的国家有更大包容性发展空间,让利益不同的国家通过合作机制逐步形成利益共同体。<sup>7</sup>

<sup>6</sup> 黄群慧等:《“一带一路”沿线国家工业化进程报告》,14-15页,社会科学文献出版社,2015版。

<sup>7</sup> 张国庆:《“一带一路”为共同发展提供了中国方案》,《全球化》,2017年第7期。



**Table 2: Income Level and Industrialization Stage of Countries along the Belt and Road (2014)**

Stage		Plate	Countries and corresponding income levels
Pre-industrialization (I)		South Asia (1)	Nepal (low-income)
Early stage of industrialization (II)	Front-section (I)	Central Asia (1), Southeast Asia (3), South Asia (1)	Tajikistan (low- and middle-income), Cambodia (low- and middle-income), Myanmar (low- and middle-income), East Timor (low- and middle-income), Afghanistan (low-income)
	Middle-section (II)	Southeast Asia (1), South Asia (1)	Laos (low- and middle-income), Pakistan (low- and middle-income)
	Later-section (III)	Central Asia (2), Southeast Asia (1), South Asia (3), West Asia and Middle East (1)	Kyrgyzstan (low- and middle-income), Uzbekistan (low- and middle-income), Vietnam (low- and middle-income), India (low- and middle-income), Bangladesh (low- and middle-income), Bhutan (low- and middle-income), Yemen (low- and middle-income)
Mid-stage of industrialization (III)	Front-section (I)	Central and Eastern Europe (2), West Asia and Middle East (2)	Albania (middle- and high-income), Moldova (low- and middle-income), Syria (low- and middle-income), Armenia (low- and middle-income)
	Middle-section (II)	Mongolia and Russia (1), Southeast Asia (2), West Asia and Middle East (2)	Mongolia (middle- and high-income), Indonesia (low- and middle-income), the Philippines (low- and middle-income), Georgia (low- and middle-income), Egypt (low- and middle-income)
	Later-section (III)	South Asia (1), Central and Eastern Europe (4), West Asia and Middle East (2)	Sri Lanka (low- and middle-income), Republic of Montenegro (middle- and high-income), Macedonia (middle- and high-income), Bosnia and Herzegovina (middle- and high-income), Ukraine (low- and middle-income), Iraq (middle- and high-income), Azerbaijan (middle- and high-income)
Later stage of industrialization (IV)	Front-section (I)	Central Asia (2), Southeast Asia (2), South Asia (1), Central and Eastern Europe (1), West Asia and Middle East (7)	Kazakhstan (middle- and high-income), Turkmenistan (middle- and high-income), Thailand (middle- and high-income), Brunei (high-income), Maldives (middle- and high-income), Bulgaria (middle- and high-income), Iran (middle- and high-income), UAE (high-income), Saudi Arabia (high-income), Qatar (high-income), Kuwait (high-income), Oman (high-income), West Bank of Jordan River and Gaza Zone (low- and middle-income)
	Middle-section (II)	East Asia (1), Mongolia and Russia (1), Central and Eastern Europe (3), West Asia and Middle East (2)	China (middle- and high-income), Russia (high-income), Croatia (high-income), Serbia (middle- and high-income), Romania (middle- and high-income), Bahrain (high-income), Jordan (middle- and high-income)
	Later-section (III)	Southeast Asia (1), Central and Eastern Europe (9), West Asia and Middle East (2)	Malaysia (high-income), Poland (high-income), Czech Republic (high-income), Slovakia (high-income), Hungary (high-income), Slovenia (high-income), Estonia (high-income), Lithuania (high-income), Latvia (high-income), Belarus (middle- and high-income), Turkey (middle- and high-income), Lebanon (middle- and high-income)
Post-industrialization (V)		Southeast Asia (1), West Asia and Middle East (1)	Singapore (high-income), Israel (high-income)

Source: Huang Qunhui, et al. (2015). *Report on Industrialization of Countries along the Belt and Road*. Social Sciences Academic Press, 14-15.

early-stage of industrialization). The different types of industry are highly complementary, so there is a great deal of room for production capacity cooperation between China and these countries. Through production capacity cooperation, China will promote the industrial upgrading, economic development and further industrialization of countries along the Belt and Road, which is of great significance for promoting inclusive and sustainable industrialization in the world. Under the Belt and Road Initiative, cooperation enables countries at varied development levels to have a more equal right to development, enables countries with a backward infrastructure to speed up development, enables countries with a weak industrial base to find broader channels for cooperation and development, enables countries with different economic systems to have more inclusive development space, and enables countries with different interests to gradually form a community of shared interests.<sup>7</sup>

<sup>7</sup> Zhang Guoqing. (2017). *The Belt and Road Provides Chinese Solution for Joint Development*. Globalization, Issue 7.

表2 “一带一路”最初倡议的沿线国家收入水平与工业化阶段(2014年)

阶段	所在板块	涵盖国家及其对应收入水平
前工业化阶段(一)	南亚(1)	尼泊尔(低等)
工业化初期(二)	前段(I)	中亚(1)、东南亚(3)、南亚(1)
	中段(II)	东南亚(1)、南亚(1)
	后段(III)	中亚(2)、东南亚(1)、南亚(3)、西亚中东(1)
工业化中期(三)	前段(I)	中东欧(2)、西亚中东(2)
	中段(II)	蒙俄(1)、东南亚(2)、西亚中东(2)
	后段(III)	南亚(1)、中东欧(4)、西亚中东(2)
工业化后期(四)	前段(I)	中亚(2)、东南亚(2)、南亚(1)、中东欧(1)、西亚中东(7)
	中段(II)	东亚(1)、蒙俄(1)、中东欧(3)、西亚中东(2)
	后段(III)	东南亚(1)、中东欧(9)、西亚中东(2)
后工业化(五)	东南亚(1)、西亚中东(1)	新加坡(高等)、以色列(高等)

资料来源:黄群慧等:《“一带一路”沿线国家工业化进程报告》,14-15页,社会科学文献出版社,2015版

### 三、合作创新者:合作创新共同迎接全球新工业革命

当前世界正迎来新工业革命时代,新工业革命的核心特征是工业发展的信息化、数字化、智能化、网络化、服务化和绿色化,新工业革命催发了大量的新技术、新产业、新业态和新模式。中国作为发展中大国,新工业革命意味着工业化和信息化、数字化、智能化、网络化的融合,而对发达国家则是再工业化与信息化、数字化、智能化、网络化的融合。与以前积贫积弱国情不同,中国已经形成了完备的产业体系和庞大的制造基础,具有了抓住这次科技和产业革命历史性机遇的产业基础条件。同时,中国具有规模超大、需求多样的国内市场,也为新工业革命提供了广阔的需求空间。因此,面对新工业革命,中国正在与世界各国一起进行开放协同创新,培育全球经济增长新动能,促进全球经济增长。通过创新发展,新工业革命背景下中国的经济增长动能也正在转换。2017年由新技术、新产业、新模式、新业态等构成的经济新动能对经济增长的贡献度超过三分之

### 3. Cooperative Innovator in the New Industrial Revolution

A new industrial revolution is coming with information-based, digital, intelligent, service-oriented and environment-friendly industrial development as the core features. The new industrial revolution gives rise to a number of new technologies, industries, business formats and models. As a major developing country, the new industrial revolution in China means the integration of industrialization with informatization, digitalization, intelligence and networking, while for developed countries, it means the integration of reindustrialization with informatization, digitalization, intelligence and networking. China has formed a complete industrial system and a tremendous manufacturing base allowing it to grab the historic opportunity with this technological and industrial revolution. In addition, the ultra-large domestic market with diversified demands provides a vast space of demands for the new industrial revolution. Therefore, faced with the new industrial revolution, China is engaged in open and collaborative innovation with other countries around the world to develop new drivers of global economic growth and thus to promote global economic growth. Through innovative development, the growth drivers of China in the context of the new industrial revolution are shifting. In 2017, new growth drivers including new technologies, emerging industries, new models and new business formats contributed to over one-third of the economic growth of China and to over two-thirds of new jobs. In 2017, the annual average growth rate of online retail sales exceeded 30%. Emerging consumption patterns including information consumption and green consumption grew rapidly.

Germany's Industry 4.0 represents the orientation of the global manufacturing industry and is the leading technical and economic paradigm in the new industrial revolution. At its core, Industry 4.0 integrates advanced technologies including sensor, IoT, industrial big data and AI through the building of cyber-physical system (CPS) to promote deep integration of logistics and information networks and realize digitalized, networked and intelligent industrialization.<sup>8</sup> China's manufacturing industry has been learning Germany's Industry 4.0 and seeking cooperation with German enterprises to increase the development quality of the manufacturing industry, promote its transformation and upgrade it, and meet the opportunities and challenges of the new industrial revolution. Cooperation in these areas has made rapid progress in recent years. For example, in early 2019, the Fraunhofer-Gesellschaft Society and Shanghai Jiaotong University signed an agreement to jointly build a project center for smart manufacturing in Lingang based on their respective advantages to conduct in-depth cooperative studies around cutting-edge technologies of smart manufacturing and Industry 4.0. It is the first in China and the tenth in the world project center of the Fraunhofer-Gesellschaft Society. In 2018, Siemens and Alibaba Cloud partnered to foster industrial IoT in China. They will employ Alibaba Cloud's infrastructure to introduce Siemens' IoT operating system and promote further development of its digital services in China. On March 16, 2018, the Bosch Power Tool "Industry 4.0" smart manufacturing demonstration factory was completed in Chengdu, China. The factory will promote sustained development of Bosch in China, and it is a great achievement in cooperation between Made in China 2025 and Industry 4.0.

China is actively welcoming the new industrial revolution as a cooperative innovator and is working hard to promote the development of high-quality manufacturing and deepen industrialization, so as to promote economic globalization in the new industrial revolution. ■

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一,对新增就业的贡献度超过三分之二。2017年网上零售额年均增长超过30%,信息消费、绿色消费等新兴消费快速增长。

以中国和德国的合作为例,中国和德国正在积极推进在新工业革命中的合作创新。德国工业4.0代表未来世界制造业发展的方向,是新工业革命最具代表性的主导技术经济范式,其核心是通过构建信息物理系统(CPS),深度整合传感器、物联网、工业大数据、人工智能等先进技术,推动物流世界和信息网络世界的深度融合,从而实现工业化的数字化、网络化和智能化的制造与服务。<sup>8</sup>中国制造业一直在通过学习德国工业4.0、寻求与德国企业合作来提高制造业发展质量、促进制造业转型升级、迎接新工业革命机遇与挑战。近些年这些方面合作进展较快,例如,2019年年初德国弗劳恩霍夫应用研究促进协会与上海交通大学签署正式合约,依托各自优势,双方将在临港地区成立上海交通大学弗劳恩霍夫协会智能制造项目中心,围绕智能制造和工业4.0前沿技术开展深入合作研究,这将是德国弗劳恩霍夫协会在中国成立的第1个、全球第10个项目中心;又如,2018年德国西门子与阿里云的合作,开始共同构建起工业物联网生态,使用阿里云基础设施推出其物联网操作系统,推进西门子的数字化业务在中国进一步发展;2018年3月16日德国博世集团的博世电动工具“工业4.0”智能制造示范工厂在中国成都正式落成,该工厂将会促进博世在集团在中国业务的持续发展,也是成都市“中国制造2025”与“德国工业4.0”对接合作的重大成果。

总之,在当今世界正迎来了新工业革命背景下,中国正以合作创新者的角色积极迎接全球新工业革命时代的到来,努力推进制造业高质量发展、深化工业化进程,从而促进新工业革命的经济全球化进程。■

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