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Comments on "The Drivers of China's Economic Growth in the Late Stage of Industrialization" by Dr. ZHAO Changwen

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Transformation of China's Pattern of Economic Growth

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- This paper summarizes nicely the shift of China's engine of economic growth
  - from investment and exports to consumption on the demand side
  - from the secondary sector (manufacturing) to the tertiary sector (services) at the industrial level
  - from factor inputs (labor and capital) to productivity growth on the supply side

  as the Chinese economy approaches a higher stage of economic development, which has come be known as the "New Normal".
- In line with the third approach, the Chinese government has emphasized more and more "supply-side reforms" as the key to sustaining long-term economic growth. This is based on the understanding that the sharp fall in the economic growth rate since 2011 is due more to a decline the potential growth rate than to cyclical fluctuations in demand.
- My comments are meant to support this view by focusing on innovation as the key to raising productivity, with private companies playing a more and more important role.

“Innovation” in the Context of China

- Three types of innovation
  1. Original innovation (invention and application of a basic or core technology)
  2. Integrated innovation (creation of a new product or management system by organically combining existing technologies)
  3. Introduction, digestion, absorption, and re-innovation

- Until now, innovation in China has mainly taken the form of (2) and (3), but (1) has also been gaining strength.

- In a broad sense, innovation may involve products, services, organizations, business models, and design as well as technology.

Factors Favoring Innovation in China

- Latecomer’s advantage
  - Not only does China have much room for technological advancement, but also it is able to introduce technologies from abroad cheaply, escaping the high costs and risks of undertaking research and development (R&D) itself.
- China is moving aggressively to open to foreign businesses and introduce and absorb foreign technologies, mainly through the following routes.
  ① Import of capital goods that embody technology
  ② Reverse engineering
  ③ Direct investment by foreign-affiliated companies
  ④ Licensing
  ⑤ Original equipment manufacturing (OEM)
  ⑥ Movement of personnel between companies
  ⑦ Overseas R&D
- China’s large population and 3 decades of rapid growth enabled ”swapping market for technologies."
- China is cultivating the hordes of science and technology-related personnel needed for innovation by enhancing its education system, particularly by encouraging the spread of university education.

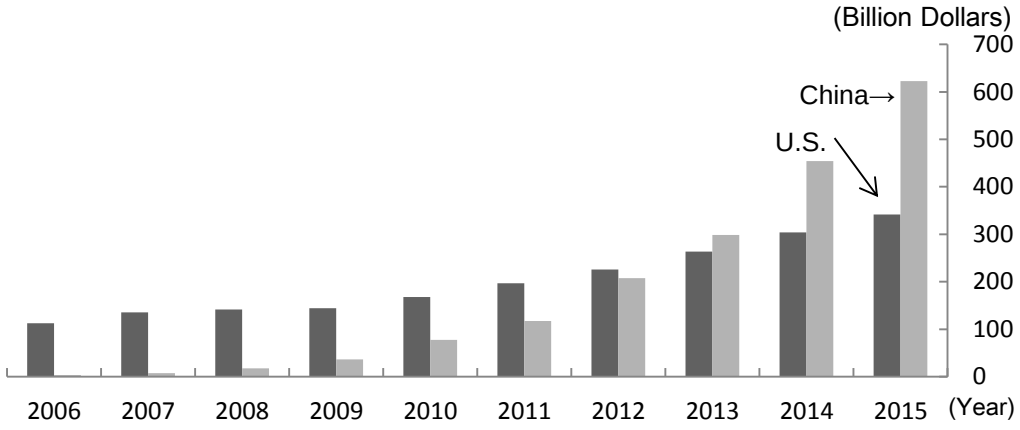
China’s Reputation for Innovation is on the Rise

- Recent and rapid progress by some high-tech industries and companies has reduced China’s historical reliance on technologies imported from overseas and raised its international reputation for innovation.
- At the national level, China ranked 25th out of 128 countries and economies in the "The Global Innovation Index 2016” jointly published by Cornell University, INSEAD, and the World Intellectual Property Organization (WIPO). (Switzerland ranked #1, Sweden #2, UK #3, US #4, Japan #16, Russia #43, and India #66.)
- At the industry level, according to an article in *Forbes* (online version), China leads the world in the following eight innovative services and products:
  - ① Micropayments
  - ② E-commerce
  - ③ Delivery services
  - ④ Online investment products
  - ⑤ Cheap smartphones
  - ⑥ High-speed rail
  - ⑦ DNA sequencing
  - ⑧ Hydroelectricity

Comparison of Online Retail Sales in China and the United States

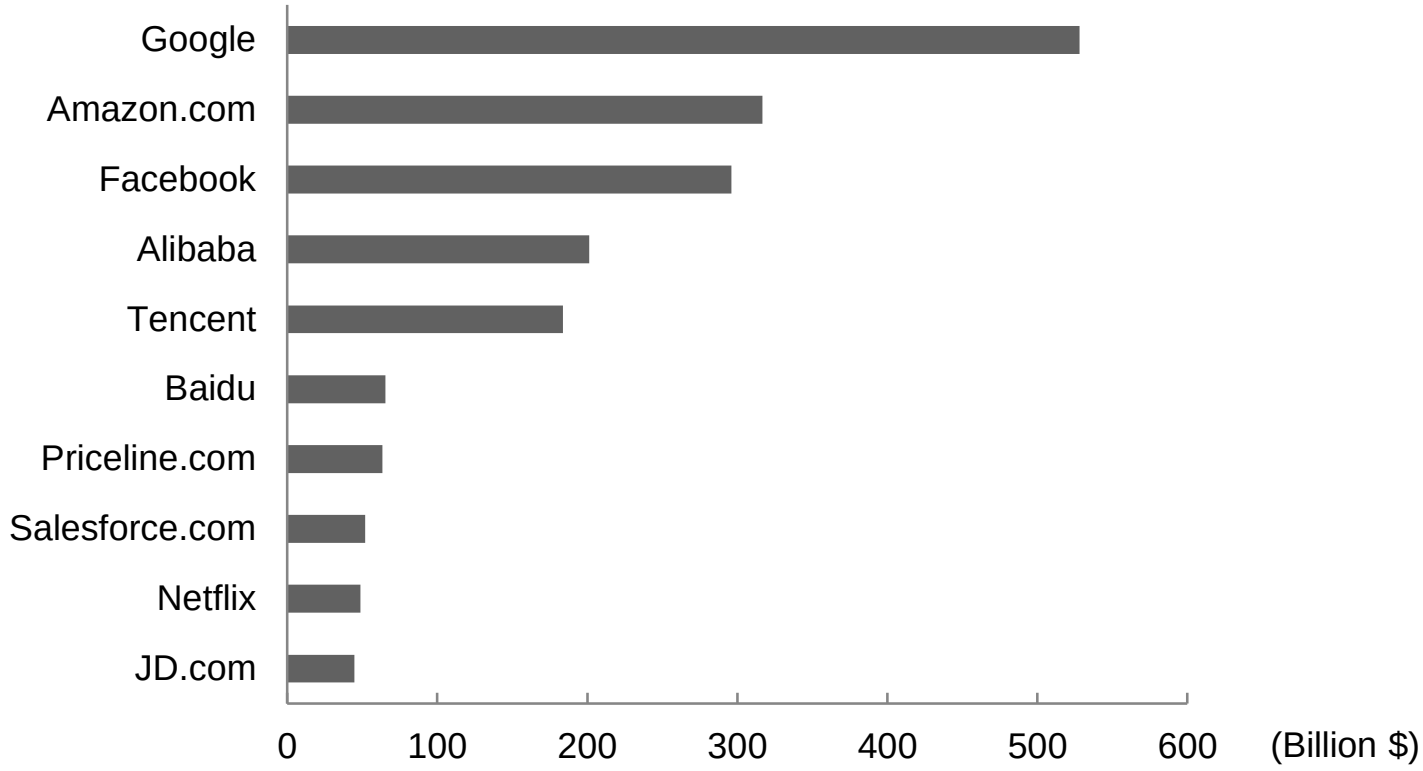
a) Share of total retail sales

b) Online retail sales volume



Source: Compiled by Nomura Institute of Capital Markets Research based on data from the U.S. Department of Commerce, the National Bureau of Statistics of China and the China Internet Network Information Center (CNNIC).

World's Top Ten Internet Companies by Market Capitalization (End of 2015)



Sources: Compiled by Nomura Institute of Capital Markets Research based on data from Bloomberg.

The Internet Industry as Leading Sector of Innovation

- Whither the digital divide?
  - Contradicting the expectation from “digital divide" theory that rapid improvements in information and communications technology will cause developing countries to lag further and further behind, China has leveraged its latecomer advantage to realize the full benefits from the spread of the internet.
- The "Internet Plus" Action Plan
  - "To encourage the healthy development of e-commerce, the industrial internet, and internet banking, and to guide internet-based companies to increase their presence in international markets, we will develop the ‘Internet Plus’ action plan to integrate the mobile internet, cloud computing, big data, and the Internet of Things with modern manufacturing." (Li Keqiang, Report on the Work of Government, National People’s Congress, March 2015)
- “Made in China 2025”
  - The "Made in China 2025" plan focuses on information and communication technology based on the internet and should be considered "the Internet plus manufacturing" version of the "Internet Plus" action plan.

The 50 Most Innovative Companies 2015

Rank	Company	Country	Rank	Company	Country
1	Apple	U.S.	26	Tata Motors	India
2	Google	U.S.	27	General Electric	U.S.
3	Tesla Motors	U.S.	28	Facebook	U.S.
4	Microsoft	U.S.	29	BASF	Germany
5	Samsung Group	Korea	30	Siemens	Germany
6	Toyota	Japan	31	Cisco Systems	U.S.
7	BMW	Germany	32	Dow Chemical Company	U.S.
8	Gilead Sciences	U.S.	33	Renault	France
9	Amazon	U.S.	34	Fidelity Investments	U.S.
10	Daimler	Germany	35	Volkswagen	Germany
11	Bayer	Germany	36	Visa	U.S.
12	Tencent	China	37	DuPont	U.S.
13	IBM	U.S.	38	Hitachi	Japan
14	SoftBank	Japan	39	Roche	Switzerland
15	Fast Retailing	Japan	40	3M	U.S.
16	Yahoo!	U.S.	41	NEC	Japan
17	Biogen	U.S.	42	Medtronic	U.S.
18	The Walt Disney Company	U.S.	43	JPMorgan Chase	U.S.
19	Marriott International	U.S.	44	Pfizer	U.S.
20	Johnson & Johnson	U.S.	45	Huawei	China
21	Netflix	U.S.	46	Nike	U.S.
22	AXA	France	47	BT Group	UK
23	Hewlett-Packard	U.S.	48	MasterCard	U.S.
24	Amgen	U.S.	49	Salesforce.com	U.S.
25	Allianz	Germany	50	Lenovo	China

Source: Compiled by Nomura Institute of Capital Markets Research based on Boston Consulting Group, ”BCG Global Innovation Survey, 2015”.

China's Top 10 PCT Applicants (Number of Applications filed, by city, 2015)

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Ranking	City	Number of Applications	Share (%)
1	Shenzhen	13,308	46.9
2	Beijing	4,490	15.8
3	Shanghai	1,060	3.7
4	Guangzhou	623	2.2
5	Hangzhou	426	1.5
6	Wuhan	387	1.4
7	Qingdao	339	1.2
8	Chengdu	300	1.1
9	Nanjing	269	0.9
10	Amoy	178	0.6
Total (including other areas)		28,399	100.0

Source: Compiled by the author based on the "Monthly Report on Patent Business Activities and General Administrative Statistics of the SIPO" of the State Intellectual Property Office (SIPO) of China.

China's Top 10 PCT Applicants (Number of Applications Filed, 2015)

Ranking	Company	Number of Applications	HQ Location
1	Huawei Technologies	3,538	Shenzhen
2	ZTE	3,150	Shenzhen
3	BOE Technology Group	1,414	Beijing
4	China Star Optoelectronics Technology	1,185	Shenzhen
5	Xiaomi	546	Beijing
6	Tencent Holdings	365	Shenzhen
7	Yulong Computer Telecommunication Scientific	269	Shenzhen
8	Baidu Online Network Technology	220	Beijing
9	Beijing Qihoo Technology	218	Beijing
10	DJI	210	Shenzhen

Source: Compiled based on documents distributed at the press conference hosted by the SIPO on January 14, 2016.

Factors Hindering Innovation in China

- Insufficient protection of intellectual property rights
- Failure of state-owned enterprises to fully utilize their personnel and capital endowments for innovation.
  - R&D is conducted less efficiently in SOEs than in small and medium-sized enterprises and private-sector companies which are subject to competitive pressure.
- Lack of both capital and experience in the venture capital industry that supports innovative and high-tech companies in China.
- Absence of an active market for ideas
  - University of Chicago Professor Ronald Coase, founder of new institutional economics and winner of the 1991 Nobel Prize in Economics, pointed out:
    - While the Chinese market transformation has spawned a booming market for goods and services and allowed China to become a leading global player in manufacturing, it has not yet created an active market for ideas. Indeed, the whole process of creating, spreading, and consuming ideas, from the education system to the media, has remained under tight ideological control and state surveillance. The state monopoly in China has severely curtailed the production of ideas." (Coase, Ronald and Ning Wang, *How China Became Capitalist, Palgrave Macmillan*, 2012.)

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Books in Japanese	*The New Normal of the Chinese Economy*, Nikkei Publishing Inc. 2015. *China Facing Two Traps*, Nikkei Publishing Inc., 2013. *China as Number 1*, Toyo-keizai Shimposha, 2009. *Economists Who Changed China*, Toyo-keizai Shimposha, 2007. *Japan-China Relations - A Win-win Game*, Toyo-keizai Shimposha, 2005. *China's Economic Reform - The Last Lap*, Nihon-keizai Shimbunsha, 2005. *Dilemma Facing the Chinese Economy*, Chikuma Shobo, 2005.
Japanese Government Committee Memberships	1996 - 97: Economic Council (Advisory Council to the Prime Minister) 1997 - 99 and 2003 -2010 : Foreign Exchange Committee (MOF) 2004 - 05: Working Group on Globalization, Council on Economic and Fiscal Policy (Cabinet Office)
Homepage	“China in Transition” (since January 2002) http://www.rieti.go.jp/en/china/index.html

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