

## Innovation

### The Story So Far

Innovation drives economic potential, especially as incomes rise and workforce and investment growth moderate. Promoting innovation is more difficult than cutting interest rates or approving projects. Innovativeness within an economy is an outcome reflecting education, intellectual property rights (IPR) protection, marketplace competition, and myriad other factors. Some countries have formal innovation policies and some do not, and opinions vary on whether government intervention helps or hurts in the long run. Many Chinese, Japanese, and other innovation policies have fallen short in the past, while centers of invention in the United States such as Silicon Valley, Boston, and Austin have succeeded with limited government policy support. In other cases, innovation interventions have helped, at least for a while.

- The 2013 Third Plenum released a series of decisions aiming at improving the innovation environment in China. Compared with previous innovation strategies, the Third Plenum placed a greater emphasis on market forces, calling for “market-based technology innovation mechanisms” while announcing that the “market is to play a key part in determinizing innovation programs and allocation of funds and assessing results, and administrative dominance is to be abolished.”
- In May 2015, China officially launched Made in China 2025 (MC2025), a 10-year strategic plan for achieving new levels of innovation in emerging sectors. The MC2025 agenda diluted the Third Plenum’s emphasis on market mechanisms with more elements of central planning. The blueprint set performance targets for 10 key industries in the proportions of domestic content and domestic control of intellectual property. An associated implementation road map document laid out specific benchmarks for global market share to be achieved by Chinese firms in emerging sectors, generating significant international backlash.
- Recognizing the prevalence of subsidy abuses and excess capacity related to its industrial policy programs, Beijing announced in December 2017 that it would gradually phase out some subsidy programs, such as for photovoltaic power generation and new energy vehicles (NEV).

- In March 2018, the U.S. Trade Representative’s Section 301 Report concluded that key parts of China’s technology push, including MC2025, were “unreasonable or discriminatory and burden or restrict U.S. commerce.” The United States then imposed trade tariffs on \$250 billion worth of Chinese imports over the course of 2018, including some products related to MC2025 and many that were not.
- In May 2019, the U.S. Trade Representative raised tariffs from 10% to 25% on nearly \$200 billion of goods from China and started to review tariffs on the remainder of imports from China. Beijing retaliated by raising tariff rates on some imports from the United States. The U.S. Department of Commerce also added several Chinese high-tech manufacturers to its “Entity List”—a list of companies believed to present national security risks to the United States—effectively restricting those firms’ access to U.S. exports.

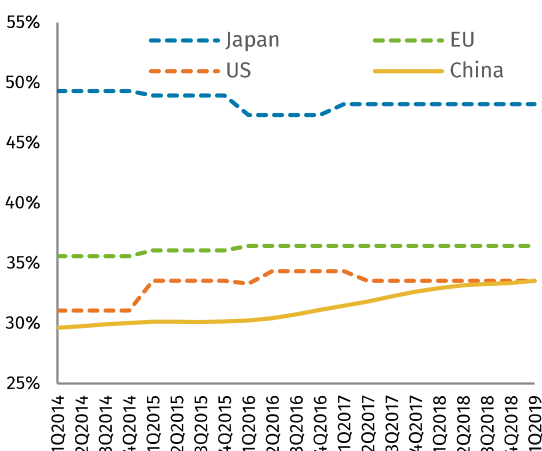
### Methodology

China’s goal is to grow innovative industries and prune low-value sunset sectors. Indicators such as patent filings are increasing, but analysts question their quality. To measure progress, we estimate the industrial value-added (IVA)—a measure of meaningful output—of innovative industries as a share of all IVA in China, which tells us how much innovative structural adjustment is happening. Because China does not publish all IVA data details, we use an indirect approach to do this. Our supplemental gauges look at value-added growth rates in specific industries, China’s performance compared with that of advanced economies in specific industries, China’s trade competitiveness in innovative products, and two-way payments flows for the use of intellectual property.

## Quarterly Assessment and Outlook

### Primary Indicator: Innovation Industry Share in Industrial Value-added

4qma, percentage



Source: OECD, National Bureau of Statistics, Rhodium Group.

- Our assessment of China's innovation reform progress in 1Q2019 is positive. Innovative industries are playing a more important role in China's manufacturing sector, as shown by our primary indicator.
- China's innovative sector outperformed others as overall industrial activity rebounded in 1Q2019. It was boosted by policy support and optimism surrounding trade talks with the United States, which have become a point of concern in light of recent tensions.
- Beijing marginally reduced market entry barriers, improved the intellectual property regime, and expanded capital market access for domestic tech companies, which are positives for innovation, although systemic trends remain troubling to firms and foreign officials.

### This Quarter's Numbers: Parity with the United States Reached

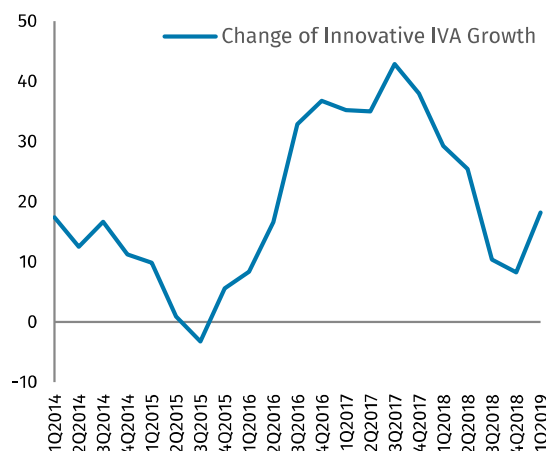
China's innovative sectors continued to outperform other industrial sectors in early 2019. Our primary indicator, **Innovative Industry Share in Industrial Value-Added (IVA)**, increased for the fourteenth consecutive quarter. As of 1Q2019, China's innovative manufacturing sectors accounted for 33.5% of total value-added in industrial activities—on par with the U.S. level (33.5% as of 2017) and just below the European Union (36.4% as of 2017). This marks a significant moment in China's development and helps explain why many advanced economies, including the United States, feel

that China's policy obligations to peers should be on a par with developed nations, not with developing economies.

Policy measures to counter China's slowing economy benefited innovative industries. Additional liquidity in the financial system, frontloaded fiscal policy support, tax cuts, and expectations of a trade war truce earlier in the year contributed to rebounding industrial activity in general and innovative activity in particular. Reported IVA growth, at 8.5% year-on-year, was the highest since 2014. Stimulative policies, which were responsible for this uptick, often benefit the traditional industries such as steel and cement more than high-tech industries. Four of the seven industries we use as proxies for innovative activity grew faster than the industrial average this period (see **Industrial Value-Added Growth Rates for Specific Innovative Industries**).

As noted in previous editions, industries with a higher share of foreign ownership have weathered the domestic slowdown better. The communication, computer, and electronics manufacturing sector, where over 70% of companies have received foreign investment (including Hong Kong and Taiwan), saw the strongest IVA growth, though the growth rate has decreased since 4Q2018. The auto sector, where foreign investors are required to form joint ventures with local partners, lags the rest, falling to 4% growth in 1Q2019, its slowest single quarter in our five-year observation window. Conditions in the auto sector are dragging down overall industrial activity because of difficulties with implementing new emissions regulations, overcapacity, and consumer pessimism.

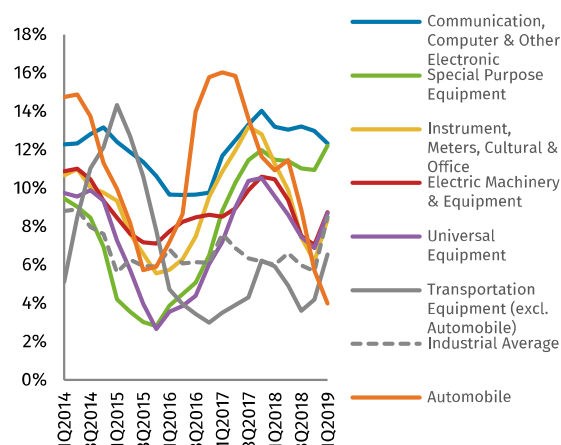
### Supplemental 1: Volatility in Innovative Industry 4qma, bp



Source: National Bureau of Statistics, Rhodium Group.

## Supplemental 2: Industrial Value-Added Growth Rates for Specific Innovative Industries

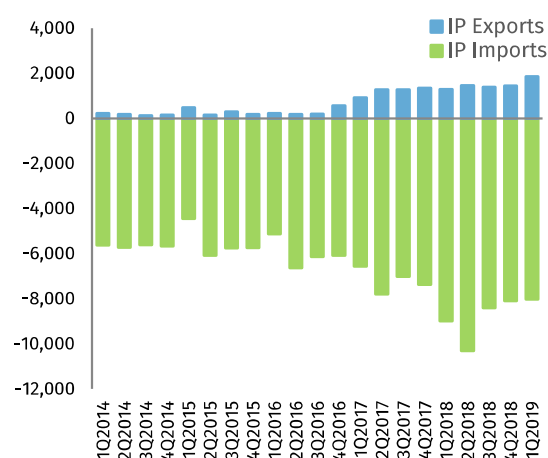
4qma, percent



Source: National Bureau of Statistics, Rhodium Group.

## Supplemental 3: Intellectual Property Flows

USD Million



Source: National Bureau of Statistics, Rhodium Group.

## Policy Analysis

China's innovation policies in early 2019 emphasized reducing market entry barriers, improving the legal infrastructure for IPR protection, and providing better capital market access to domestic technology companies. Authorities implemented new measures to address problematic past practices, with some material improvements. Beijing also launched a capital market initiative to sustain funding for innovative companies as the economy cools.

Historically, foreign investment and global value chain participation have been main drivers of industrial upgrading and technology advancement in China; in the current period, Beijing announced new opportunities for

foreign investment (see **Cross-Border Investment**), which will likely support innovation. In July, the Ministry of Commerce updated its “negative list” to reduce the number of restricted sectors for foreign investment from 48 to 40. In addition, the Ministry of Industry and Information Technology rescinded two “white list” regulations in shipbuilding and new energy vehicle battery manufacturing that excluded certain foreign investors from entering the market. While hurdles to implementation remain, these are positive steps toward a more competitive environment in domestic industries, which is conducive to innovation outcomes.

China needs stronger IPR protection to foster and commercialize innovation. Over the past six months, Beijing addressed several problematic policies that undermined IPR protection amid ongoing U.S.-China trade talks, suggesting that these changes were made in response to U.S. complaints. As noted in the **Spring 2019** edition, the State Council in March removed several controversial provisions in the Technology Import and Export Regulation, which were specifically cited in the U.S. Trade Representative's March 2018 Section 301 Report as proof of China's discriminatory treatment of foreign IPR. The revisions likely contributed to Washington's decision on June 3 to suspend a pending World Trade Organization complaint—originally launched in March 2018 in tandem with the Section 301 case—regarding China's IPR protection regime. Additionally, the National People's Congress Standing Committee (NPCSC) passed several amendments to the Trademark Law and Anti-Unfair Competition Law in April. These included shifting the burden of proof from the plaintiff to the defendant when evidence of a violation is strong and explicitly outlawing obtaining trade secrets through electronic intrusion. In an unusual move, the NPCSC fast-tracked the process, and the changes became effective immediately. Although these actions addressed some U.S. concerns about forced technology transfer and cyber theft, they did not prevent the trade war from escalating (see **Trade**).

Meanwhile, Beijing launched a major capital market initiative to attract and support domestic technology companies as the long-running boom in private equity and venture capital investment moderates. The Shanghai Stock Exchange Science and Technology Innovation Board (STAR) started trading in late July. One of Beijing's goals is to give domestic innovators more access to direct financing. Companies that seek to list on the STAR board must only register with the exchange, rather than wait for government approval. Profitability and minimum capital

requirements have also been relaxed for companies that can demonstrate sufficient technology or innovation potential.