

# 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 often 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 determining 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 2013 Third Plenum’s emphasis on market mechanisms with more elements of central planning. The blueprint set specific performance targets for 10 key industries in proportions of domestic content and domestic control of intellectual property. An associated implementation roadmap 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 in photovoltaic (PV) power generation and new energy vehicles (NEV).
- In March 2018, the U.S. Section 301 Investigation 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.

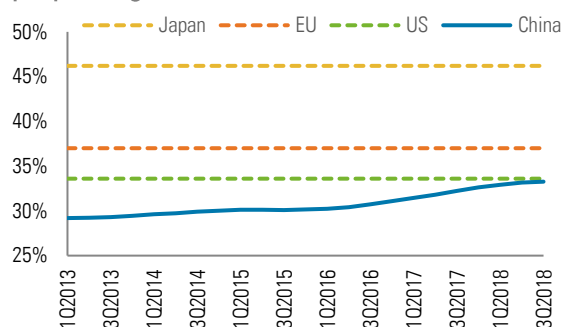
## METHODOLOGY

*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 presently 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: National Bureau of Statistics, Rhodium Group.

- Our assessment of China’s innovation progress is slightly positive, the same as last quarter. The primary indicator, which measures the weight of innovative industries in China’s economy, continues to increase albeit at a slower pace than in our last review: higher-innovation industries are outgrowing others.
- Our data tell two interesting stories in this review period: that U.S. trade action against China has had minimal impact on its innovation goals so far, and relatedly, that a heavier concentration of foreign firms in innovative sectors is helping China’s higher-end sectors outperform a slowing economy.
- However, upcoming investment and export restrictions targeting Chinese companies could negatively impact China’s innovation drive.

## THIS QUARTER'S NUMBERS

**Innovative Industry Share in Industrial Value-added**, our primary indicator, slightly increased from 33.2% to 33.3% this quarter. This is the 11th quarter of consecutive growth for this indicator, and it shows that innovative industries continue to play a larger role in China's industrial mix.

While China's innovative industries are outperforming a slowing economy, the pace at which they are growing vis-à-vis other sectors slowed modestly in this review period to 10 basis points (bps), down from 25 bps in 2Q2018 (see **Volatility in Innovative Industry**). This occurred for two reasons: first, because the non-auto transportation equipment sector (i.e., rail, ships, aircraft) did not grow during the review period. Infrastructure investment grew by only 3.3% year-on-year (yoy) in the first nine months of 2018 – a dramatic drop from around 20% average growth in 2017 (though we expect this to turn around in 2019). Second, many high-polluting producers (i.e., steel mills) front-loaded production, anticipating government production curbs during the winter to improve air quality. As a result, the “non-innovative” share of industrial activity increased. We expect these effects to last into 4Q2018. Still, China is on pace to catch up to the U.S. level of IVA from innovative industries over the next few quarters.

One of the reasons for this outperformance of innovative industries is the role that foreign firms play in China's high-tech sectors. Of note, our primary indicator captures the aggregate output of both domestic and foreign companies operating in China. And official statistics show that foreign investments play a major role in driving high value-added industrial output. For example, foreign-funded (including Hong Kong, Macau, and Taiwan) businesses accounted for 77% of China's total high-tech exports in 2016 (the most recent year of available data).

This significant presence of foreign firms in China's innovative industries, and their lower dependence on volatile local financing sources, has lately provided a crucial buffer against the consequences of deleveraging, which tightened credit conditions for many sectors. For example, the industry category “communication, computer & electronics,” which accounts for 27% of total innovative-industry value-added as of 3Q2018, grew at 13.2% yoy, up from 13% in 2Q2018 (see **Industrial Value-Added Growth Rates**). This was more than double the industrial average of 6% in 3Q2018. This subsector also has the largest share of foreign-funded company participation in high-tech industries: foreign firms accounted for 44% of total assets in communication and

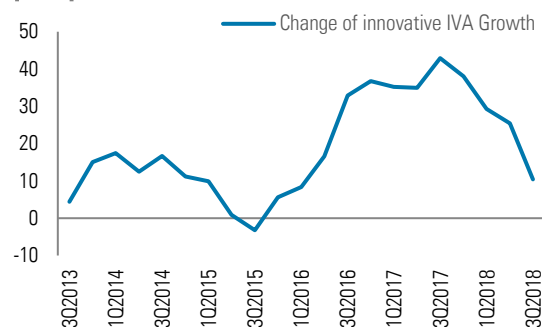
electronics manufacturing, and 68% of total assets in computer and office equipment manufacturing as of 2016.

Foreign high-tech companies are not immune from China's economic slowdown, of course, and the past quarter saw increased uncertainty about the outlook for the Chinese consumer in particular. For example, consumer electronics giant Apple expressed concerns about the Chinese market in early January 2019 while issuing a weaker-than-expected earnings report for the fourth quarter of 2018, amplifying market concern about China's economic trajectory.

Another important conclusion in this period is that the Section 301 investigation by the U.S. Trade Representative (USTR), initiated in March 2018, has had minimal impact on China's innovation progress so far. The USTR concluded that China's industrial policies were “unreasonable or discriminatory and burden or restrict U.S. commerce.” The United States imposed a 25% tariff on \$16 billion of Chinese imports that were directly related to MC2025, and a broader set of \$200 billion in imports that were not directly related to China's industrial policy efforts. Yet MC2025 industries grew steadily even after U.S. tariffs became effective in August 2018. Communication, computer, and electronic equipment industries grew at more than twice the industrial average, as noted above. Electric machinery, another industry targeted by the U.S. tariff list, grew by 7.5% in 3Q2018, down somewhat from 9.4% in 2Q2018, but still above the industrial average. We believe the industry is likely to bounce back in the fourth quarter, according to preliminary data from October and November 2018. It still may be too early to see an impact from tariffs; however, these indicators will warrant greater scrutiny going forward.

### Supplemental 1: Volatility in Innovative Industry

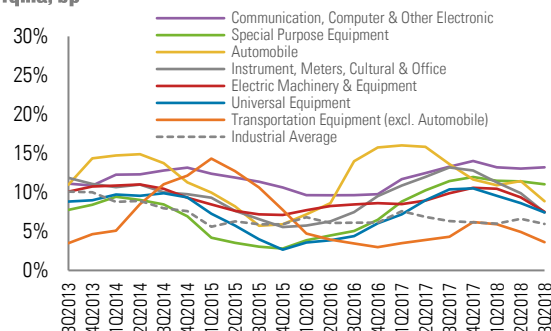
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Source: National Bureau of Statistics, Rhodium Group.

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

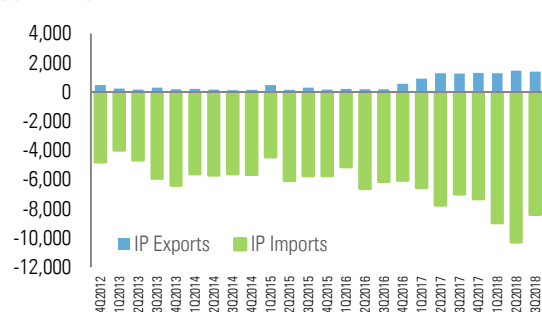
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Source: National Bureau of Statistics, Rhodium Group.

### Supplemental 3: Intellectual Property Flows

USD Million



Source: National Bureau of Statistics, Rhodium Group.

## POLICY ANALYSIS

The U.S.-China trade war continued to boil in this review period, and China's innovation policy was a central focus of dispute. A key question is whether Beijing will soften its industrial policy ambitions to mitigate the potential for additional punitive trade action from the United States.

On December 6, Premier Li Keqiang held the first meeting of the National Science and Technology Leading Group (STLG). The STLG is perhaps the most prominent government body tasked with managing China's innovation policies. Curiously, the official meeting readout did not mention MC2025, which may have been a deliberate omission. In the days following the meeting, some international media reports speculated that Beijing might be in the process of revising its MC2025 program to address U.S. concerns. There is some evidence supporting this speculation: in recent months, references to MC2025 in government publications and officials' public remarks have almost entirely disappeared.

Some analysts suspect that Beijing is merely rebranding its industrial policies without changing the content. The USTR, for example, updated its Section 301 Report in November 2018, concluding that despite the fact that Beijing seemed to be deliberately downplaying MC2025, "China fundamentally has not altered its acts, policies, and practices related to technology transfer, intellectual property, and innovation, and indeed appears to have taken further unreasonable actions in recent months."

In the absence of material concessions from China on industrial policy, the United States continued to ramp up investment and trade restrictions. On November 19, 2018, the U.S. Department of Commerce issued for comment the draft list of "emerging technologies" that would be subject to expanded export controls, including artificial intelligence (AI) and robotics as well as much else. Beginning on November 10, 2018, the Committee on Foreign Investment in the United States (CFIUS) started requiring reviews of critical technology investments, from aircraft to telephone apparatus manufacturing. These export control and investment screening measures are likely to impact China's innovative industries negatively over the long term, because many Chinese companies depend on U.S. partners to supply core technologies and key components. In addition, the U.S. decision to arrest an executive of Chinese telecommunications giant Huawei marks a more distinct break in the trajectory of commercial relationships between U.S. and Chinese firms. The U.S.-China technology symbiosis of the past three decades is changing, and innovation performance on both sides is likely to suffer during the transition.

A slightly more positive development during the review period occurred on December 4, when Beijing released a memorandum of understanding (MOU) among 38 government agencies related to intellectual property rights (IPR) protection. The MOU called for coordinated government actions against IPR violations. Potential

penalties included denying access to capital markets, as well as restrictions on land supply and transportation facilities. Although the MOU did not have the same legal status as legislation or the binding effect of regulations, it was still a notable step forward because the MOU had actionable rules and buy-in among a broader set of constituencies within the government.