

VIEWPOINT.

The American Chamber of Commerce in Shanghai - Viewpoint April 2018

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Chasing Innovation: R&D Barriers and Incentives in China



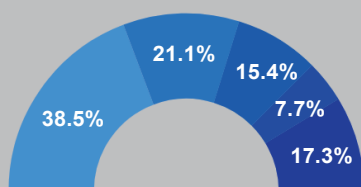
2018

Survey Demographics

The 52 respondent companies vary significantly in size, industry and length of time in China, providing a well-rounded view into the conditions and opinions of foreign companies conducting R&D in China.

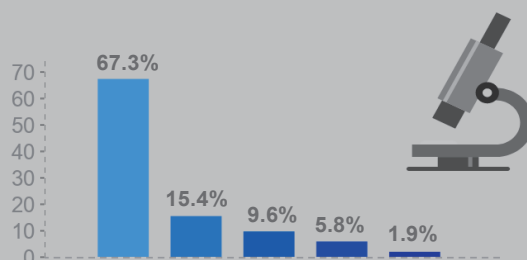
The largest group of respondents were high-end manufacturers (42% of total respondents), followed by bio-pharmaceuticals (19.2%). The remaining respondents represent a wide range of industries, including IT, chemical and consumer goods.

How many R&D employees do you have?



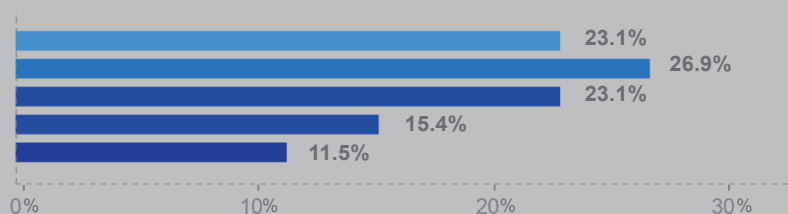
■ <50
 ■ 50-100
 ■ 100-500
■ 500-1000
 ■ >1000

How long have you conducted R&D in China?



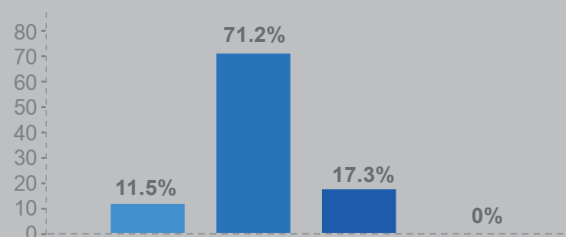
■ Over 10 years
 ■ 5-10 years
 ■ 3-5 years
■ 1-3 years
 ■ Less than 1 year

How much has your company invested in R&D in China?



■ Less than USD 1 million
 ■ USD 1-10 million
 ■ USD 10-50 million
■ USD 50-100 million
 ■ Over USD 100 million

How much experience does your average R&D employee have?



■ 1-5 years
 ■ 6-10 years
 ■ 10-15 years
 ■ 16+ years

Executive Summary

China is eager to transform itself into a modern, innovation-based economy with a strong research and development (R&D) base. Both central and local government bodies have rolled out development plans and investment incentives to encourage foreign companies to increase and upgrade their R&D footprint in China. Shanghai leads this trend and actively encourages foreign companies to increase R&D investment in the city through numerous incentives including tax breaks, trade facilitation measures and subsidies. While many companies have established an R&D presence in China, most are reluctant to bring their core technologies and some companies have recently closed or scaled back their R&D investment.

This report examines the policy environment, trends and challenges facing foreign companies doing R&D in China, and provides recommendations for improving innovation and attracting more high-level foreign R&D. To understand the R&D environment, AmCham Shanghai conducted a survey in January 2018 of 52 member companies with R&D facilities in China. Additionally, we conducted in-depth interviews with about 15 companies in late 2017 and early 2018, talking with heads of R&D departments and government affairs leaders to learn more about the challenges, opportunities and realities of conducting R&D in China.

With 426 foreign-invested R&D centers, Shanghai ranks as the top location for foreign R&D in China. However, R&D conducted in Shanghai continues to be at the low end and focused on product development for the local market. The most prohibitive barriers identified by companies are a lack of IPR protection, market access restrictions and an unlevel playing field, with several companies noting that there is no incentive to bring core technology or high-end R&D to China unless their IPR is protected. Some also noted the need for closer integration among universities, start-ups and foreign companies to foster a more mature innovation ecosystem.

Key survey findings

- **75%** of respondents' primary reason for establishing R&D operations in China was to meet the demands of the local market.
- Fewer than **4%** of respondents indicated that their China operations were their most important global R&D center, while over **60%** said they were just "one of many supporting global R&D centers" or "of minimal importance."
- **30.8%** replied that their main R&D focus in China is adapting/redesigning global products for the Chinese market. Only **11.5%** are conducting advanced/cutting-edge research.
- Lack of IPR protection ranked as the number one barrier to R&D.
- Nearly **60%** ranked tax breaks as the most beneficial incentive, and another **21%** ranked this as number two.

Recommendations

Many companies appreciate the Shanghai government's R&D incentives and efforts to support R&D, but the programs have limited impact because they do not align with the core needs of innovative companies, namely improved IPR protection and market access. To help the Shanghai government achieve its goals, we urge it to:

1. Increase market access
2. Improve IPR protection
3. Allow internet freedom
4. Ensure a level playing field
5. Expand the innovation ecosystem

I. Shanghai's pursuit of innovation & the role of foreign companies

In the past five years, China has worked to transform its economy from an investment-heavy, export-oriented growth model to one based on high-tech manufacturing and domestic consumer demand. To achieve this goal, China has focused on the need for more innovation, identifying it as one of the five key components in its 13th Five-year Plan (2016-2020). Shanghai is positioning itself at the forefront of this trend, aiming to be "an innovation center of science and technology of global influence"¹ by 2020. China has steadily grown its R&D spending from \$9.5 billion in 1991 to \$185 billion in 2009, at which point it became the world's second-largest R&D spender. It has since remained in second place, with the latest data showing China's R&D spending at \$409 billion in 2015, second only to the \$503 billion spent by the U.S.²

In May 2017, the Shanghai municipal government approved 33 measures aimed at creating "a new open economy system, with systemic innovation at its core." Five months later, the Shanghai government issued a document titled *Several Opinions of the Shanghai Municipal People's Government on Further Supporting Foreign-Funded Research and Development Centers in Participating in Shanghai's Building of Globally Influential Science and Technology Innovation Center*, which provided 16 guidelines for supporting foreign R&D centers (hereafter referred to as the *16 Guidelines*³). This document similarly called for "accelerating the march toward a globally influential science and technology innovation center, adhering to a global perspective and international

standards... and promoting the cross-border flow and global allocation of innovation factors." These initiatives are part of the Shanghai government's efforts to attract more foreign R&D.

Foreign companies play a major role in both Shanghai's overall economic growth and development, and in its innovation ambitions. According to official data from the Shanghai government, at the end of November 2017, Shanghai was home to 614 regional headquarters for multinational companies, with foreign-invested companies (FIEs) contributing over a quarter of Shanghai's GDP. Although foreign-invested firms account for only 2% of Shanghai's total number of companies, the government's *2017 White Paper on Foreign Investment in Shanghai* says, "these foreign invested firms contributed 27% of GDP, 60% of industry output, 65% of imports and exports, 33% of tax and 20% of jobs in the city."

According to Shanghai government data, at the end of 2017 Shanghai was home to 426 foreign-invested R&D centers, ranking it first among Chinese cities. Twenty of these centers have invested more than \$10 million, and six of the companies surveyed for this report have invested over \$100 million. According to government data for the first eight months of 2017, foreign-invested R&D centers accounted for more than 50% of the output value and total sales of new products in Shanghai. As the data indicates, foreign R&D centers boost China's economy, support Shanghai's establishment as a "headquarters economy" and help expand technological innovation – all of which contribute to Shanghai's and China's innovation goals.



1 The idea was first introduced by the central government in May 2014, and officially included as part of the national strategy in the 13th Five-Year Plan in March 2016.

2 Data is from CSIS's *China Power Project*, and based in current year dollars.

3 The 16 measures laid out in this document seek to improve the overall investment environment for R&D in Shanghai by strengthening IPR protection, providing a wide range of subsidies, expanding import/export green channels, and simplifying visa and insurance policies regarding employment of foreign workers.

Despite these efforts, our survey data and interview feedback show that the Shanghai government must do more if it expects companies to expand their R&D investments in ways that aid Shanghai's innovation ambitions. Due to concerns over intellectual property rights (IPR) protection, technology transfer and market access, most companies are reluctant to bring their most valuable intellectual property and R&D processes to China.

II. The changing landscape of foreign R&D in China

Foreign companies have long pursued R&D in China, with many making significant investments and establishing large facilities. This trend continues today, but along with an evolving policy landscape, the growth of Chinese cutting-edge technology, a highly skilled workforce, and a rapidly changing consumer base whose buying power is beginning to rival major western markets, the strategic goals and rationale behind foreign R&D in China have changed significantly.

When foreign companies began setting up R&D centers in China, they were incentivized to do so because of the low cost of land, labor and capital. These centers focused almost exclusively on low-level research contributing to broader global R&D objectives. One company with a long history of R&D in China described its early operations as a "cheap extension of our global team."

Today's R&D environment in China has changed considerably.

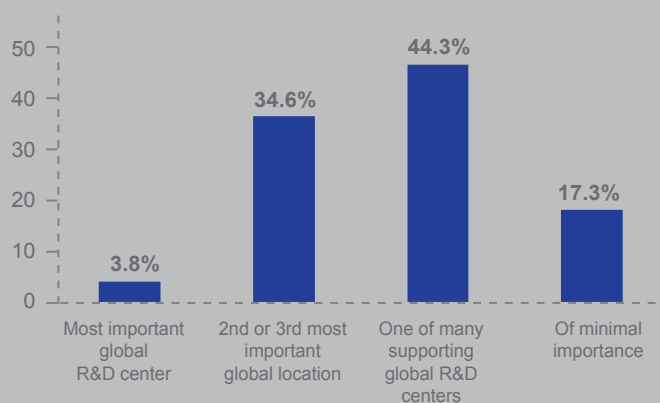
Rather than acting as a cheap extension of their global team, foreign companies are investing in R&D in China to meet the demands of the domestic market. China's rapidly growing consumer base often demands different types of products than in the west, and preferences tend to change more quickly as well – all of which increasingly requires China-specific R&D. Meanwhile, the availability of a higher level of talent and technology has further attracted foreign R&D, while the high costs of land and labor have now become major impediments. But while the importance of conducting R&D in China for China has grown significantly, most companies remain hesitant to bring their core technologies.

R&D scope and focus

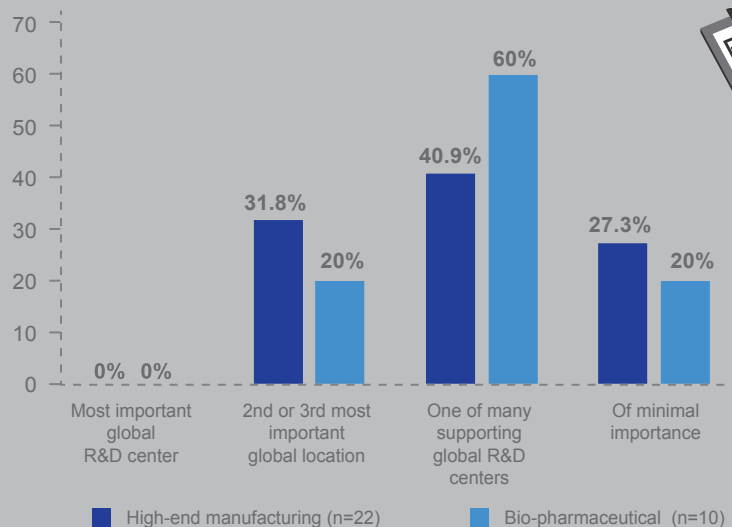
In terms of global R&D operations, respondents indicated that China remains of relatively low importance compared to other regions. While just over a third of respondents ranked their China R&D as the "second or third most important global location," the majority said China was only "one of many supporting global R&D centers" (44.2%) or "of minimal importance" (17.3%). Only 3.8% (2 respondents) said China was their most important global R&D center.

These sentiments were most pronounced in the biopharmaceutical sector, where no respondents said China was their most important R&D location and only 20% ranked it among their top three. While the high-end manufacturing sector drew many more "2nd or 3rd most important" responses (31.8%), it similarly had no companies claiming China as their top R&D center and was also heavily weighted toward the options of lesser importance (68.2%).

How important are your R&D operations in China compared to your Global R&D footprint?



Importance of China R&D operations (by sector)



consumers. In many cases companies pursue both of these strategies concurrently. In interviews, many companies emphasized the importance of this approach to their ability to grow. Companies must develop products for the local market to expand their market share. This remains a core reason for having significant R&D capacity locally, according to many company representatives, as there is often little market incentive to conduct their most advanced research in China.

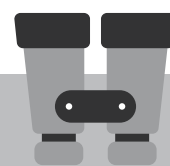
The third strategy – innovating new products in China for export (while also selling them

When looking at the type of R&D foreign companies conduct in China, three strategies emerge: global to local, local to local, and local to global. For the past 10-15 years, global to local has been the dominant strategy. This entails low-level R&D focused on modifying and adapting existing products to China's consumer market.

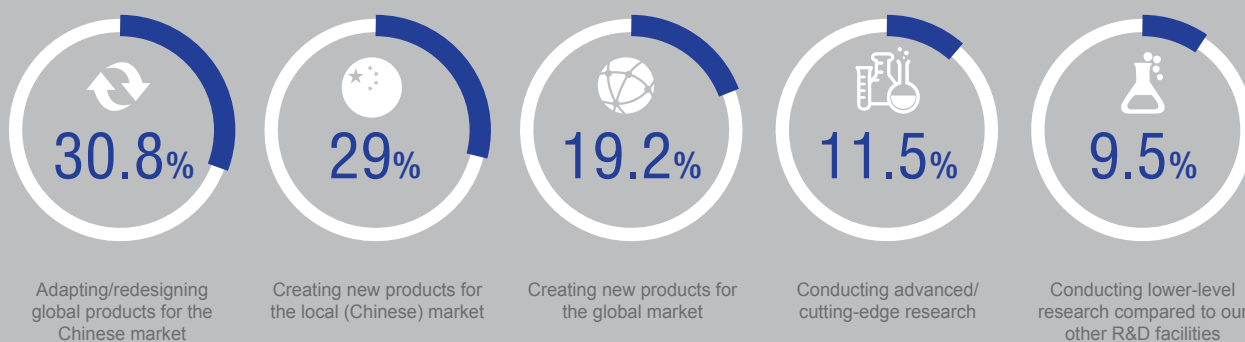
Companies pursuing the local to local strategy move beyond just adapting products to local market conditions and begin developing new products aimed at domestic

domestically) – is what the government seeks to achieve. Many large foreign companies doing R&D in China have begun doing this, albeit on a limited scale. Companies need not pursue all three strategies, or consider them as a sequence. Some companies enter the market today pursuing the second or third step only.

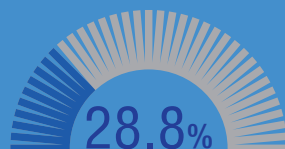
We asked companies to identify their primary R&D focus in China and discovered that most pursue a global to local strategy of adapting products to the China market.



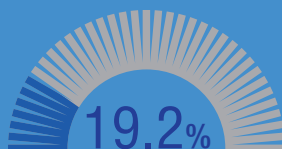
What is the main focus of your R&D operations in China?



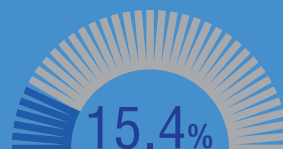
What are the most significant barriers to conducting R&D in China?



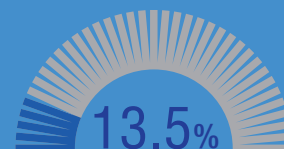
Lack of IPR protection



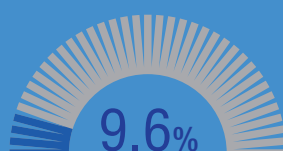
Government policies that favor local companies/unlevel playing field



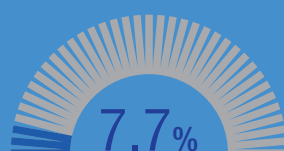
Lack of talent



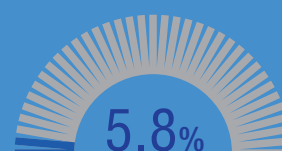
Unclear government policies and regulations/lack of transparency



Data security/data localization issues

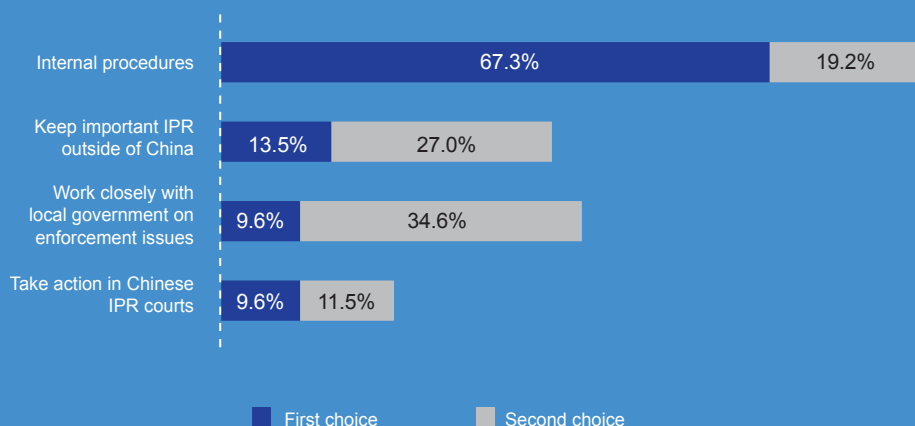


High costs



Restricted access to information (internet and other media)

How do you manage IPR risks?



When asked why companies established R&D facilities, 75% said their primary reason was to meet local market/customer demands and more than 30% of respondents said the focus of their R&D operations in China is adapting/redesigning global products for the Chinese market. There are signs, however, of change. Nearly 20%

of the respondents said they create new products for the global market and 11.5% said they conduct advanced/cutting-edge research. This trend is strongest in the biopharma sector, with 30% saying they conduct advanced/cutting-edge research, compared to only 9.1% of high-end manufacturers.

Barriers to foreign R&D

Foreign companies pursuing R&D in China face many barriers, several of which prevent them from bringing their core R&D to China. Surveyed about the most significant of these barriers, lack of IPR protection was the largest impediment (28.8%). No other factor drew greater than a 20% response, though "government policies that favor local companies/unlevel playing field" came close, at 19.2%.

IPR protection and an unlevel playing field were especially pronounced in the high-end manufacturing sector, being the top two responses (31.8% and 27.3%, respectively). While these were ranked second and third by bio-pharma respondents, "unclear government policies and regulations/lack of transparency" took the top spot at 40%.

In discussions, interviewees regularly identified IPR protection as the greatest impediment to conducting high-level research in China, with several saying it is a fundamental barrier preventing them from bringing their core technology to China. Survey data confirmed this, with "lack of IPR protection" ranking as the most significant barrier to R&D.

We also sought to understand how companies deal with the IPR risk created by the R&D work they undertake in China. The majority selected "internal procedures" (67.3%) as their top method of managing the associated risk. A sizable number also identified working closely with the government as a viable option. Nonetheless, nearly half (42.7%) ranked "keep important IPR outside of China" first or second. This demonstrates the significant impact of China's weak IPR protection and how it damages the country's ability to attract foreign cutting-edge R&D. This lack of adequate legal protection for intellectual property is further highlighted by the more than 80% of respondents who ranked "take action in Chinese IPR courts" among the least effective ways to manage IPR risk.

III. Incentivizing R&D: does it work?

The government has provided many incentives for foreign companies to conduct R&D in Shanghai. The latest are outlined in 2017's *16 Guidelines*, and include a wide range of subsidies. According to a statement by Shang Yuying, head of the Shanghai Municipal Commission of Commerce, "R&D centers will obtain policy and financial support from the local government and enjoy more simplified services in terms of

entry and exit procedures, talent introduction and customs clearance." She added: "We hope to attract more global R&D centers of multinational companies that are at the highest level within the company and carry the function of allocating R&D resources around the globe."⁴

To gauge the effectiveness of such measures, we asked respondents to rank the top three government incentives. Tax breaks was the clear favorite, with 57.7% of respondents ranking it first and over 86% of respondents choosing it as a top three incentive. "Customs and CIQ green channels" was the only other incentive ranked first by more than 10% of respondents (17.3%), yet it failed to be identified as a top-three incentive by even half of the respondents. The purported benefit of other incentives was limited, though "funding for a specific project" drew a noticeable response of 21.2% as the second-ranked incentive.

High-end manufacturing respondents were especially fond of tax breaks, with 63.6% ranking them number one and an additional 18.2% ranking them second. Bio-pharma respondents favored Customs and CIQ channels as their top option (60% ranked this first), but also chose tax reforms as the second-most beneficial incentive.

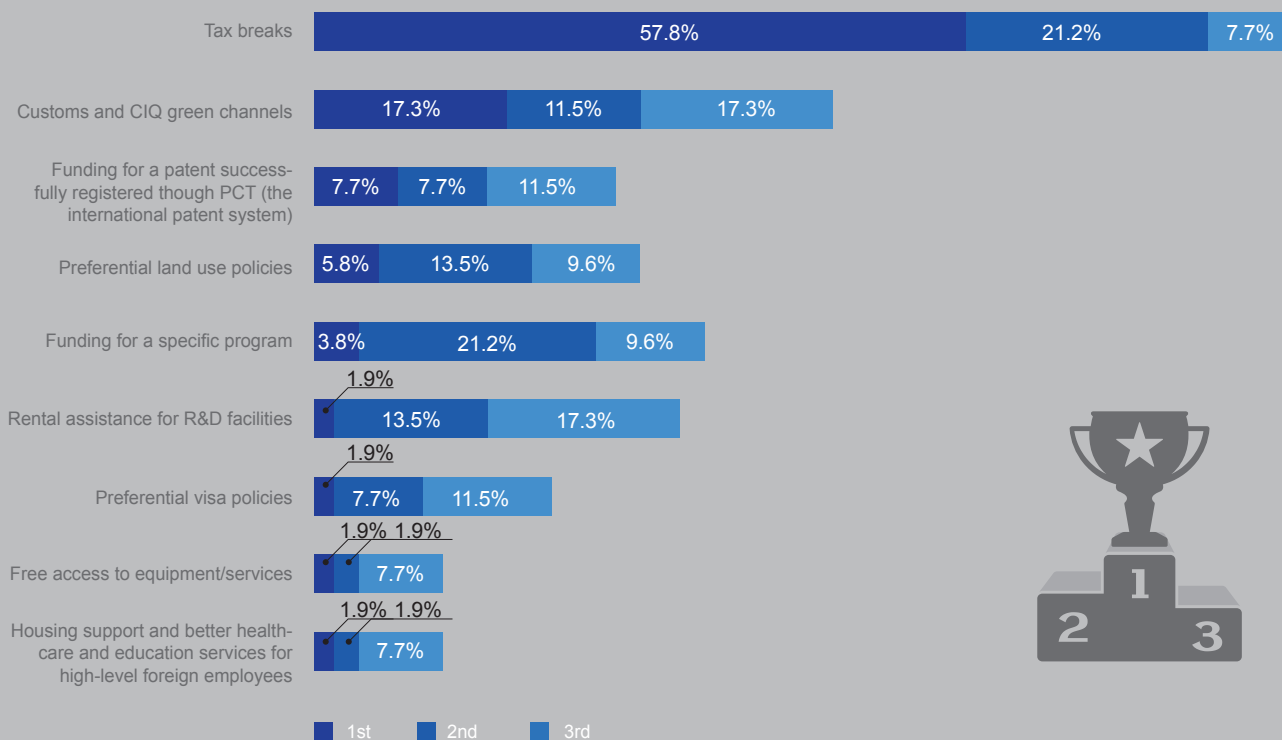
We also asked members to choose those factors that would most influence them to expand R&D operations in China. Better IPR protection was the first choice, identified by 57.7% as their top priority – far beyond any other option. Concerns over IPR were particularly prevalent in the high-end manufacturing sector, where 77.3% choose it as one of the top two options. Interestingly, the high-end manufacturing sector selected "education reform promoting creativity and innovation" second, at 40.9%. Meanwhile, bio-pharmaceutical respondents' primary concerns were market access and fewer regulatory hurdles, both reaching 60% as the top two factors that would lead them to expand operations.

These responses are especially noteworthy, since the Shanghai government is seeking to increase foreign R&D. But most government actions and incentives do not coincide with the needs of the companies they are aimed at. Clearly the key to expanded R&D in China is better IPR protection.

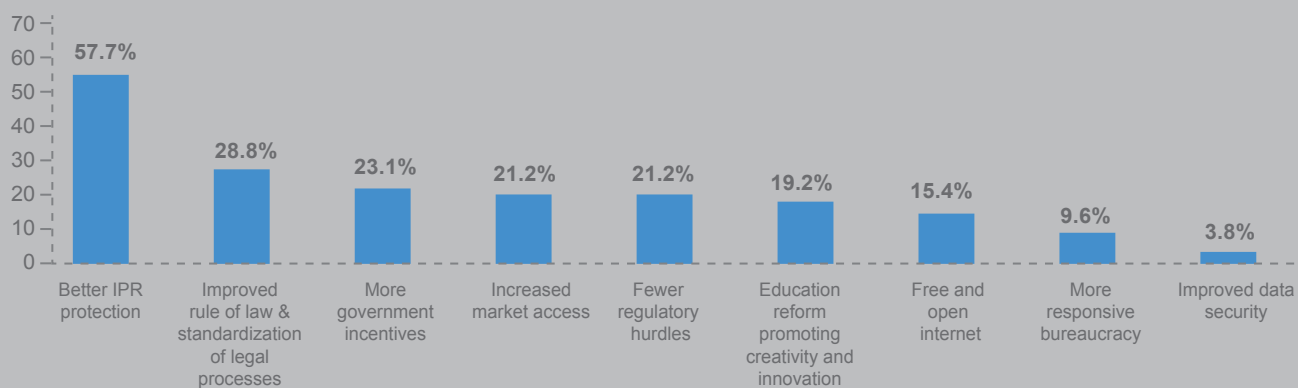
While the *16 Guidelines* and other policies are encouraging, these incentives are unlikely to fully achieve the government's intended objectives. The consensus among survey respondents is that they will only increase R&D in China if it

⁴ From the October 17, 2017 *China Daily* article "Shanghai unveils steps to attract foreign R&D centers," which reports on Shang Yuying's media briefing about the new guidelines.

Please rank the top three government incentives which have been most helpful to your R&D



Please select the top two factors that would most influence you to expand your R&D operations in China



makes strategic and financial sense. While incentives such as subsidies, simplified procedures and improved customs clearance are welcome, they fail to address larger concerns about market access and IPR protection.

Market access concerns vary by industry. Bio-pharmaceuticals see diminishing incentives to conduct

R&D in China as they face significant market entry barriers and few safeguards for innovative discoveries. Drug manufacturers often face long approval times, and frequently the market is flooded with cheap knockoffs by the time the manufacturer receives product approval. This reduces the financial incentive of conducting the long and expensive drug discovery process.

Recommendations

Shanghai's government provides many incentives for foreign R&D. Companies welcome these policies but the government's areas of emphasis do not adequately match foreign companies' needs. To meet its development goals Shanghai must not only provide incentives and subsidies but also tackle systemic problems such as market access, IPR protection and an unlevel playing field. Some of these issues may be beyond the Shanghai government's purview, but given Shanghai's leading role in both openness and innovation, we encourage Shanghai to champion the changes necessary to meet China's innovation ambitions. To support R&D in China, AmCham Shanghai recommends that the Shanghai government:



1. Improve market access: Western firms conduct R&D because of market incentives rather than government directives. If companies cannot fairly access the market they have little reason to pursue R&D. The Chinese government should continue to eliminate barriers to foreign companies.

Specific recommendations:

- Open sectors of the economy that are closed to foreign ownership and investment.
- Remove joint venture requirements, equity caps and pressure to transfer technology.
- Accelerate approvals for innovative drugs and medical devices. Relieve pricing pressures on innovative medicines and allow companies to charge a higher price for innovative medicines.
- Eliminate unnecessary data localization regulations. Such policies restrict market access (i.e. cloud computing) and limit foreign companies' ability to conduct international business in a free and secure manner.



2. Improve IPR protection and rule of law: Lack of IPR protection is the primary concern of foreign companies conducting R&D in China. Several companies interviewed for this survey indicated this is a fundamental barrier and will not consider moving core technologies to China until the problem is resolved.

Specific recommendations:

- Increase penalties for IPR infringements. Penalties can include both criminal charges and financial fines. Penalties should be meaningful and enforced fairly and consistently.
- Expand and improve the specialized IPR court system. We are encouraged by the 2014 establishment of specialized IPR courts in Beijing, Shanghai and Guangzhou. This network should be expanded nationally and granted more authority.



3. Internet freedom: Many companies say that internet restrictions are a barrier to attracting top talent. Scientists are curious by nature and need a work environment that provides open access to information. Several interviewees mentioned the inability to access Google Scholar and other important information hubs. While companies address this problem with the use of VPNs, tighter controls on the internet could diminish access to information.

Specific recommendations:

- Ensure access to global information networks by allowing the continued use of VPNs that are affordable and secure.
- Experiment with eliminating internet restrictions in the Shanghai FTZ. This would allow a greater exchange of ideas and information which is important to R&D researchers. The Shanghai FTZ plays a special role as a testing ground for reforms and would be an ideal place to demonstrate the benefits of a more open internet.



4. Ensure a level playing field: To incentivize MNCs to bring core R&D technologies to China and contribute to cutting-edge innovation, create a level playing field. Industrial policies such as Made in China 2025 provide many subsidies, incentives and other programs that foreign companies can rarely enjoy.

Specific recommendations:

-Simplify the process for foreign companies to apply for government scientific grants and subsidies, and allow all companies fairly to compete for funding. This would improve competition and lead to better results from these programs.

-Allow foreign companies to participate in government initiatives to award startup grants. Foreign companies also have expertise and can help improve the results of these grant programs.

-Expand Customs green channels for importing/exporting R&D materials: Many R&D centers cannot easily import necessary material for research, a process that often takes 3-4, or even 6 months. The government should copy the visa invitation program that fast-tracks visa approvals for certified companies and create a similar program to help companies import materials.

-Ease restrictions and regulations for importing used high-quality lab equipment. Many companies buy high-quality and specialized lab equipment to conduct research. This lab equipment is often well maintained and can be used for many years. Allowing companies to more easily import this type of equipment can help control costs.



5. Improve the innovation ecosphere: Shanghai's innovation ecosphere lags behind that of Boston, Silicon Valley or even Beijing and Shenzhen.

Specific recommendations:

-Increase communication among MNCs' R&D operations, universities, research institutions, start-ups, and the government. Establish a government-led R&D forum to keep companies abreast of the latest policy developments, including tax incentives, and serve as a channel for them to express their concerns to the government.

-Improve the quality and commercialization of university research. Companies highlighted the minimal role of universities in R&D and innovation in China (only two companies identified "proximity of top universities" as an important influencing factor when deciding where to establish R&D centers in China). Companies have begun to work more with local universities to build closer ties and locate talent. The Chinese government should encourage these initiatives and provide incentives for these types of partnerships.

-Improve investment financing: The government finances much R&D, but decision makers often lack the experience or scientific background to judge projects. The government should use more experts when allotting funding to ensure it focuses on science- and market-based ventures. The Government should consider allowing some funds to operate more like PE and VC funds which are less risk averse and willing to invest in innovation.

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