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# Research Brief 2013-2

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### *The State of China's Defense Research and Development: Great Expectations*

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### Summary

The current status of China's defense research and development (R&D) capabilities is mixed. The defense R&D sector is undergoing significant structural and institutional change while benefitting from continued, substantial government support for funding, infrastructure, and cross-innovation community development efforts, all taking place in an age of increasing globalization. This brief outlines key internal and external factors likely to impact China's progress in pursuit of its defense R&D ambitions as well as considerations for U.S. policymakers.

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Beijing views the present period through 2020 as a window of opportunity for maximizing China's leverage of the still-globalizing economy for the purpose of developing a dual-use, modern defense industrial development system to serve China's ambitious military modernization goals. For China's defense sector, it is the best of times in terms of government support; it also could be the worst of times from their perspective because of enforced reforms and, more so, if these efforts do not achieve their intended results by the leadership's 2020 deadline. Clearly, the pressure is on to reform and substantially improve China's defense R&D performance by then.

The current status of China's defense R&D capabilities is mixed. China's defense R&D sector is undergoing significant structural and institutional change. Several key internal and external factors are important in determining how effective these changes might be.

## INTERNAL FACTORS

In addition to the leadership transition already underway and its inevitable influence over the pace and direction of future defense R&D priorities, there are several other key internal factors affecting China's defense R&D status and outlook. These include, but are not limited to:

- Level of support and continued funding from government and other sources;
- Level of autonomy (from all levels of government authority) in decision-making;
- Degree of openness to, and interconnectedness with, other key actors in and across the scientific and R&D community as well as throughout China's innovation-oriented clusters, zones, and regions;
- Demographic trends (urbanization, migration, population, education skill sets, and transition to younger versus older researchers, among others);
- Level of corruption and other market and systemic disruptions (including secrecy of the defense sector);
- Party-Army-business relations, potential conflicts of interest, and the level of compliance (or resistance to same) by China's defense in-

dustry with ongoing Party reform efforts; and

- Degree of success or failure (real and perceived) in delivering reliable, advanced defense capabilities to the Chinese military and export markets.

## EXTERNAL FACTORS

Numerous external factors also could impact China's defense R&D status. External factors worth keeping in mind include the following:

- The current and long-term state of the global economy (whether globalization continues apace as Beijing expects);
- The direction and scope of China's brain drain/gain;
- The level of international conflict and competition affecting demand for globally sourced defense items (including, increasingly, from China);
- Demonstration of Chinese combat capabilities (or lack thereof) in a regional or international conflict; and
- The degree of external threat perceived by leaders in Beijing and elsewhere, as well as responses to same.

## ASSESSMENT

An assessment of China's current defense R&D sector reveals several important considerations for U.S. defense policymakers.

China's defense R&D development strategy rests on connections that can be made across a diverse array of actors, institutions, and innovation systems—both foreign and domestic, civil and defense-related—and the technology transfers, spillovers, and innovative ideas and practices they convey. An increasingly important part of this effort is the attraction of overseas educational partner institutions, some of whom see China as a "gold mine" for educational expansion opportunities. Chinese professionals in highly specialized, particularly scientific, fields are also being incentivized to return.

Spending on basic research and development programs with potential defense implications can be expected to continue to rise along with increased military spending.

In terms of both military spending and funding of scientific endeavors, China is becoming a more attractive marketplace for domestic and international businesses, scientists, and researchers, who are knocking on Beijing's increasingly open door in greater numbers to take up residence and exploit the expanding sources of support. This is particularly so as funding for these activities has become more scarce in the West since the 2008 financial crisis. Notwithstanding the many complexities—indeed, difficulties and uncertainties—inherent in conducting such activities in China, the growing opportunities available, along with well-funded, government-sponsored incentives (at the central, provincial, and local government levels) designed to promote foreign investment, faculty appointments, and scientific research in China, could play a potentially important role in expanding China's own defense R&D community and related capabilities, as it is intended to do.

China's defense conglomerates increasingly are being shaped in the mold of Western defense contractors: as large-sized, mainly defense-sector-oriented enterprises that are also engaged in rising levels of international business (commercial and defense) across the globe, whose particular competitive advantages include close and long-standing contractual relationships with government and military clients, and as particularly capable complex systems integrators (or, at least, are advertised as such). Yet this vision of developing a modern defense industry similar to that found in the West (along the lines of Lockheed Martin, Boeing, Northrup Grumman, EADS/Airbus, and others) is a far cry yet from being realized.

China's opening of parts of its defense industrial sector to domestic and foreign investment, if modest at this stage, presents the potential for a similar dynamic to that which took hold in the commercial sector where enterprises could in time (in this case, global defense industrial enterprises) come to view the China market as one in which they "cannot not" be invested. This dynamic could take hold if China's defense sector is viewed by defense firms as a strategic and competitive investment, particularly in the context of declining Western military budgets and China's expected increased spending on military modernization.

It is unclear at present whether ongoing defense R&D sector reforms are focused simply on fixing persistent institutional problems common in the past or focused also (or more so) on improving processes due to the types of challenges that success can bring. The likelihood is that it is a mix of both. But it is important to not presume that continued reforms indicate failures per se, as has often been the case in the past. It is important instead to determine whether ongoing reforms indicate progress among China's leadership and/or a growing openness to change—or even to accepting failure—in the pursuit of more effective and efficient innovative processes, institutions, and personnel (for instance, if pursuing but failing to achieve high-risk, yet high-reward scientific research). Analysts are advised to at least be alert to this possibility despite the long-established pattern in China of institutional and systemic reforms following periods of defense industry and R&D failings, particularly given the PLA's recent revelations of various advanced military platforms such as subs, fighter jets, and missile and space technologies.

## CONCLUSION

If China comes to be viewed (as it was and remains in the commercial sphere) as an essential market in which international scientific experts and defense firms feel they cannot not be engaged in an increasingly globalized environment, this could tip the scales toward anticipating more progress in China's ability to realize its defense R&D ambitions than toward the otherwise more likely scenario of modest, incremental progress amid continued reform efforts.

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