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A New Technonationalism? China and the Development of Technical Standards

Chinese technology executives, government officials, and members of its research community are debating how far to push the country's strategy for promoting technology standards at home and abroad.

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Last year's highly publicized controversy over China's attempts to promote its own wireless communications standard WAPI (wireless authentication and privacy infrastructure) called attention to the country's quest for greater international technological leadership and independence. As the WAPI case illustrates, Chinese efforts to assert itself technologically through an active standards-based technology policy has the potential for creating considerable conflict with its trading partners while raising concern in the advanced industrialized countries that China has embarked on a new technonationalist course. Although China ultimately backed away from its insistence on the WAPI standard, many observers expect it will not end the conflicts being generated by the country's emerging standards strategy.

Students of modern Chinese history should not be surprised by evidence of technonationalism in its approaches to modernization. The roots of technonationalism go back to the 19th century, becoming especially pronounced after the People's Republic was established in 1949. Although China relied heavily on the Soviet Union for science and technology during the 1950s, the souring of that relationship helped make legitimate the emphasis placed on technological self-reliance in Mao Zedong's development ideology. China's most dramatic technological achievements of the second half of the 20th century—in nuclear weaponry and space technology—were characterized by a high degree of independent development and tend to support technonationalist instincts. In light of this history, the surprise is not that we see today the manifestations of technonationalism; it is more that over the past 25 years, China has been as willing as it has been to sacrifice self-reliance and increase its dependence on foreign technology.

This change of direction began with the introduction of the open-door policy toward foreign science and technology during the late 1970s. One result was China sending thousands of students abroad for advanced training, the acquisition of vast amounts of foreign technology, the steady liberalization of foreign investment (and technology transfer) policies, surging foreign investment beginning in the early 1990s, and ultimately entry into the World Trade Organization in 2001. During the same period, though, China also initiated extensive reforms in its domestic R&D system.

Over the past 25 years, then, we can see Chinese technological development following two tracks: One is characterized by heavy reliance on foreign technology (increasingly associated with expanding foreign direct investment); the other involves a significant reconfiguration of domestic institutions for higher education and research, the introduction of

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high-priority focused national research and development programs, and in the past 10 years significant increases in spending on research and education.

Reflecting both strong traditions of self-reliant technonationalism and the new interest in technoglobalism so apparent in the post-Mao era, both tracks have contributed to the enhancement of Chinese technological capabilities. While often mutually reinforcing, the two approaches are also not without contradictions. Chinese manufacturers (the technology users) often prefer performance characteristics associated with imported technology. Members of the Chinese research community (the domestic technology producers), on the other hand, often feel this preference for foreign technology frustrates development of a national innovation system. Meanwhile, China's entry into the WTO has created new conditions for both exacerbating and resolving these tensions.

By facilitating increased foreign penetration of the Chinese industrial economy, WTO membership has created considerably more competition for Chinese enterprises. Increased foreign investment has led to perceptions among many Chinese executives, government ministers, and scientists that the country is becoming excessively dependent on foreign technology, a dependence that threatens national security and undermines the gains Chinese industry would otherwise be able to realize from participation in the global economy. For instance, in a number of product lines in different industries, including consumer electronics, Chinese firms work with only the slimmest of profit margins, while the global technological leaders—with their control of intellectual property, standards, and technological architecture more generally—earn attractive rents from technology licensing.

Such concern is being expressed at a time when the effort to rebuild and reform the indigenous educational and research systems are beginning to show results. It is not surprising, therefore, that China's technology policy leaders are calling for more domestically developed Chinese technology in Chinese products; that Chinese innovators are being asked to be more aggressive in defining and claiming intellectual property rights; and that the development of indigenous Chinese standards is to be encouraged in the context of reforming and reorganizing the country's standards regime. Hence, we see a series of new initiatives for standards setting as part of a new national standards strategy. While these developments could be taken as a sign of a troubling new technonationalism, such an interpretation, without qualification, could lead to unnecessary misunderstandings of the complex mix of forces at play.

The effective implementation of a national standards strategy in China will be affected by a number of factors. First, the motivations for developing distinctive Chinese standards vary considerably. National information security considerations figure prominently in some standards-setting initiatives. In others, royalties, profits, and relative gains are the drivers. In some cases, developing standards that are more culturally compatible may be an issue. More generally, a sense of growing technological capabilities and market power for standards setting—especially in the context of technonationalism—may be at work. However, as we look at WAPI and other cases, it is clear that interpretations of technonationalism themselves vary considerably within China. While some parties might see national and local interests served by having a strong national standards strategy, many others—who have benefitted from international standards—could be disadvantaged by such a strategy.

We should not assume that there is a true consistency of objectives about standards in China. If anything, collective preference formation is becoming a more complex problem as the technical, industrial, and government regulatory communities become more differentiated as a result of economic changes and new government-industry relationships. Thus, when looking at the sources of initiative for new standards, we see the consequences of years of reform and organizational change. While government ministries (whose interests are not always identical or even very compatible) still play prominent roles, Chinese companies (with a variety of ownership arrangements and relationships with the state), newly established industrial associations, research institutes, and universities have also become important actors. Initiatives from one or more of these groups are not necessarily welcomed by—or compatible with the interests of—others. China's standards strategy, in short, must accommodate a considerable heterogeneity of interests.

The prospects for its success, especially with reference to the availability of the necessary resources, must also be assessed. Proponents of a vigorous strategy normally call attention to two resources of particular relevance: One is the growing technological capability noted earlier; in this view, an aggressive standards strategy should be pursued because China believes it has the technological capability to set technically advanced standards. The other is market size; with such a large and growing market, the argument goes, standards set for and by China will become standards internationally as well.

The efficacy of both factors, however, has been questioned. Some observers have argued, for instance, that appeals to the Chinese market, rather than leading to standards that will be accepted internationally, might actually result in a more parochial standards arrangement that would put China at a disadvantage. As for the question of technological capabilities, most examples of China's standards-setting initiatives are clear evidence of the work of an increasingly capable technical community. At the same time, they also show that standards-development efforts involve and can often depend on important contributions from foreign partners.

Foreign involvement points to both the existence of limitations on Chinese technological capabilities and the need for ongoing ties with technology leaders, as well as to the fact that international collaboration is increasingly important in the development of new technologies. China's standards strategy must deal with this manifestation of technoglobalism, suggesting that, in time, Chinese efforts to develop indigenous standards will be far more accommodating to non-Chinese interests than the WAPI case initially suggested. Foreign governments and corporations, as seen also in the WAPI case, are increasingly mobilized to see that they are.

There can be little doubt that China's market size, increasing technological capabilities, cultural preferences, and sense of growing international importance do indeed ensure that the country will become an increasingly active promoter of technical standards. But, as noted here, it would be a mistake to assume that its approach to a standards strategy is monolithic or that it is insensitive to non-Chinese interests. Instead, we should recognize that the world's engagement with China on standards issues is quite feasible, and that successful engagement will proceed with due recognition of the diversity of interests at play within the country.

This is not to deny that the interest in standards setting is serious or that it is unrelated to the deep strains of technonationalism in China; the Chinese government remains committed to the promotion of Chinese standards through its R&D spending and regulatory policies. But, for China's foreign commercial and governmental interlocutors, it is important to recognize that the country's transition from socialism toward a market economy has generated increasingly complex and diverse economic interests, and the globalization of research and innovation works in favor of moving that transition toward acceptance of a more interdependent technoglobalism. C

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