Why China Can’t Innovate
And What It’s Doing About It
by Regina M. Abrami, William C. Kirby, and F. Warren McFarlan

The Chinese invented gunpowder, the compass, the waterwheel, paper money, long-distance banking, the civil service, and merit promotion. Until the early 19th century, China’s economy was more open and market driven than the economies of Europe. Today, though, many believe that the West is home to creative business thinkers and innovators, and that China is largely a land of rule-bound rote learners—a place where R&D is diligently pursued but breakthroughs are rare.

When we ask why, the answers vary. Some people blame the engineers. “Most Chinese start-ups are not founded by designers or artists, but by engineers who don’t have the creativity to think of new ideas or designs,” argues Jason Lim, an editor at the website TechNode.

Others blame the government for the unprecedented scale of its failure to protect intellectual property rights. Apple’s products have been pirated the world over, they point out, but only China has opened...
entirely fake Apple stores filled with employees who think they work for the U.S. company.

Still others blame the Chinese education system, with its modernized version of what the Japanese scholar Ichisada Miyazaki calls “China’s examination hell.” How can students so completely focused on test scores possibly be innovators?

From our decades of field experience and research in China, and the dozens of case studies we have collectively produced, we see some merit in all those views (but we must point out that many of the most innovative Western firms were founded by engineers). Those criticisms don’t tell the entire story, however. China has no lack of entrepreneurs or market demand. And given the government’s enormous wealth and political will, China has the potential to set the kind of economic policies and build the kind of education and research institutions that propelled the U.S. to technological dominance. But will that potential be realized? We see considerable challenges.

A look at how innovation is happening in China—from the top down, from the bottom up, through acquisition, and through education—sheds light on the complexities of the issue, highlighting the promise and the problems China faces in its quest to become the world’s innovation leader.

Innovation from the Top Down
In its 2006 “Medium- to Long-Term Plan for the Development of Science and Technology” (MLP), the Chinese government declared its intention to transform China into “an innovative society” by 2020 and a world leader in science and technology by 2050. That was not empty talk. Beijing has a solid track record of setting policies and incentives, and then watching citizens and local government officials, right down to the village level, fall in line with them.

For nearly 40 years, in fact, the Chinese government has been using its wealth of funds and political will to stimulate innovation from the top. In the 1980s and 1990s, China created the National Natural Science Foundation and the State Key Laboratory program, and revamped its Soviet-style Chinese Academy of Sciences to fund pre-commercial university research on a peer-reviewed (rather than a political) basis, in much the same way that the National Science Foundation does in the United States. At the same time, the state, with support from regional governments, financed the development of high-tech zones to further innovation commercialization. Since 1985, when the first such zone was developed, in Shenzhen, they have proliferated to the point where they are a common stop on official tours of any major Chinese city.

The power of the government to shape nascent innovative industries can be seen in the effects of its policies on the wind turbine industry. In 2002 the government launched an open bidding process for wind farm projects to encourage competition among turbine makers. Foreign imports soon flooded China’s fledgling market. In a pattern that it would repeat in other industries, the government then required state-owned enterprises to source 70% of their components from domestic firms. Foreign firms continued to invest directly in China, but by 2009 six of the top 10 wind turbine firms were Chinese. This capped off a remarkable growth spurt in domestic firms’ share of total sales, from 51% in 2006 to 93% in 2010.

The aim of the 2006 MLP was to reduce China’s reliance on imported technology to no more than 30% within a few years, to increase domestic R&D funding, and to leapfrog foreign rivals in what the government identified as “strategic emerging sectors,” among them biotechnology, energy-efficient technologies, equipment manufacturing, information technology, and advanced materials. To that end, the Chinese government introduced export subsidies for Chinese firms and a policy requiring government ministries and state-owned businesses to procure goods, when feasible, from Chinese-owned companies. Despite objections that those moves violate the terms of China’s membership in the World Trade Organization, few international firms have left, instead resigning themselves to supporting innovation within China.

In fact, whereas in 2004 there were some 600 foreign R&D centers in China, by 2010 that number had more than doubled, and their scale and strategic importance had increased. Pfizer moved its Asia headquarters to Shanghai that year. In 2011 Microsoft opened its Asia Pacific R&D center in Beijing, and General Motors opened an Advanced Technical Center comprising several engineering and design labs. Merck’s Asia R&D headquarters in Beijing is scheduled to become operational in 2014.

There is perhaps no more potent demonstration of China’s ability to set, and often realize, ambitious goals than the government’s backing of high-speed rail and efforts to put humans on the moon, both massive projects that require funding on a scale seemingly impossible in the West and an ability to invent and adapt numerous technologies. We believe such ambitions could jump-start innovation in much the same way that government-funded programs did in the United States in the second half of the 20th century.

Innovation from the Bottom Up
There are limits, though, to what even so muscular and motivated a government as China’s can mandate when it comes to innovation. Against the government’s intentions and national resources run powerful currents that originate in China’s Communist system and ancient culture.

Consider how those forces can constrain the entrepreneurial creativity bubbling up in China. In the early 1990s Edward Tian
(Tian Suning), a U.S.-educated entrepreneur, founded the telecom start-up AsiaInfo (now AsiaInfo-Linkage), which within three years grew into a thriving company of 320 people with revenue of $45 million.

In 1996, frustrated with the slow pace of technological change in China’s telecommunications industry, then-vice premier Zhu Rongji convinced Tian that it was his duty to leave AsiaInfo in order to lead a new company, China Netcom, as it set out to build a fiber-optic network linking some 300 cities. When one of us (McFarlan) visited the company, in 2001, it was an innovative firm with an open, creative culture, despite the fact that it was jointly owned by four government agencies.

In 2002, when the telecommunications giant China Telecom was broken apart by the government, its 10 northern provincial markets were integrated into China Netcom. Overnight, Tian became responsible for an organization of 230,000.

The culture clash between the two organizations was extraordinary. Tian was seen by many China Telecom employees as an American outsider trying to reform a state-owned enterprise in unacceptable ways. Six months after the merger, McFarlan presented our case study on China Netcom to 70 senior Chinese executives, including 20 from the telecom industry. Rather than draw lessons from the case about the relationship between organizational change and business success, the group attacked Tian for his “un-Chinese” ways of managing—and then charged McFarlan with incompetence for presenting Silicon Valley culture in China in such a positive light. Tian soon stepped down from his CEO role and later from the China Netcom board.

To outsiders, China Netcom eventually looked like a modern telecom firm, with the governance structures needed to be listed on international stock exchanges. But it remained at heart a state-owned enterprise. When we teach our current case on China Netcom, we ask MBA students to scour the company’s board for the real boss. Where, we ask, is the party secretary? The Communist Party requires a representative to be present in every company with more than 50 employees. Every firm with more than 100 employees must have a party cell, whose leader reports directly to the party in the municipality or province. These requirements compromise the proprietary nature of a firm’s strategic direction, operations, and competitive advantage, thus constraining normal competitive behavior, not to mention the incentives that drive founders to grow their own businesses.

But even if the government were to disband party cells and instead redouble its efforts to encourage breakthrough innovation, there remains an even stronger disincentive: the economic realities of the markets in which Chinese companies operate. Why go to the trouble to pioneer innovative offerings when the rewards and growth prospects for incremental improvements are so vast, both at home and abroad?

Consider the B2B portal Alibaba, which in 2001 was so shaky that we feared it would go bankrupt. But by creatively adapting foreign technologies to the needs of developing markets, Alibaba now serves 80 million customers in nearly 250 countries. The success of its auction website, Taobao, eventually forced eBay out of China. Or take Baidu, the Chinese search engine leader, which has grown massively in its home market with an offering that breaks no technological ground and does not challenge political orthodoxy. Having tailored its product, organization, and processes to the needs of China’s patchwork of regional markets, Baidu now has an 80% share of what has become the world’s largest search market.

Just as Japan caught up with the United States technologically in many industries during the three decades after World War II, China is now doing the same through incremental innovations. Adapting technology has become a standard and highly lucrative practice. Getting that technology through acquisitions, though, is an important new trend.

**Innovation by Acquisition**

Much has been written about the current wave of Chinese overseas direct investment, most of which has focused on commodity resources, particularly in Africa and Latin America. The turn toward the United States and Europe for technology, however, is no less significant. Tired of paying licensing fees and royalties, Chinese firms have increasingly, and with their government’s

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**The Communist Party requires a representative in every company with more than 50 employees.**
Creating Leaders Through the Liberal Arts

The Chinese have come to believe the mantra of many American colleges that the best leaders are those with the broadest education in the liberal arts. The goal of a liberal education is not to train specialists but to educate the whole person to be curious, thoughtful, and skeptical.

Today all Peking University students, even in its Guanghua School of Management, take multiple courses in the liberal arts, including literature, philosophy, and history. The university also boasts an elite liberal arts curriculum in the Yuanepei Program, named for Peking University’s famous German-educated chancellor of the early 20th century, the philosopher Cai Yuanpei. Across the street, Tsinghua’s School of Economics and Management has implemented what is perhaps the most imaginative program in liberal arts and general education in any Chinese university.

The most important revolution in Chinese higher education today may not be its size and scope but the fact that even under the leadership of engineers, top institutions have come to understand that an education in the absence of the humanities is incomplete. Perhaps this is because educational leaders in China know better than anyone what can happen when a society loses its cultural foundations. This is an education revolution within a revolution, the outcome of which is not yet clear.

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**Innovation Through the Next Generation**

In the first half of the 20th century, China developed strong state-run institutions (Peking University, Jiao Tong University, National Central University, and, at the apogee of research, the Academia Sinica). These were accomplished by a creative set of private colleges and universities (Yenching University, St. John’s University, and Peking Union Medical College, to name but a few). All were Sovietized in the 1950s and destroyed in the political turmoil of the Cultural Revolution.

Now Chinese universities are back. Take Tsinghua University. It was founded in 1911 with American-returned funds from the Boxer Indemnity as a two-year liberal arts college to prepare students for study in the United States. It became a comprehensive university in Nationalist times (John Fairbank, the founder of modern Chinese studies in the United States, learned his Chinese history there in the 1930s) and a Soviet-style polytechnic university in the 1950s. It is now reclaiming its place as a great comprehensive university—more difficult to get into than Harvard or Yale. In 2016 Tsinghua will open its first truly international college—Schwarzman College, named for the U.S. donor Stephen A. Schwarzman—to 200 postgraduate students annually from around the world. The Schwarzman Scholars who reside there will, Tsinghua believes, be the Rhodes Scholars of the 21st century.

Simply in terms of the number of students educated, the recent changes in China’s postsecondary education system are more dramatic than even the great postwar expansion of higher education in the United States or the growth of mass-enrollment universities in Europe in the 1970s and 1980s. After a decade in which most were shuttered, in 1978 Chinese universities opened their doors to fewer than 1 million students. By 1998 enrollment had reached 3.4 million, far short of the 14.5 million attending in the United States.
at the time. In 2012 23.9 million students attended institutions of higher learning in China—some 4 million more than the enrollment at U.S. colleges and universities.

Private colleges and universities now account for more than a quarter of all higher education institutions in China, and they are growing at a faster rate than public ones. Large companies are also getting involved. Alibaba’s Taobao unit, for instance, has established Taobao University, initially to train e-business owners, managers, and salespeople. In time it will offer business education to more than a million online students.

China will soon turn out more PhDs each year than any other country in the world, as Chinese universities aim to be cradles of high-level, creative research and forces capable of transforming research and innovation into higher productivity. The Chinese government and many other sources are pumping enormous revenues into the leading institutions. Within 10 years, the research budgets of China’s elite universities will approach those of their U.S. and European peers. And in engineering and science, Chinese universities will be among the world’s leaders.

Will Chinese universities set global standards in the 21st century? It is possible (even though none currently ranks in the global top 50) simply because of the resources they are likely to have. But the more important question is whether China has a good institutional framework for innovation.

Our answer at present is no. The governance structures of China’s state-owned universities still leave too many decisions to too few, too self-important, people. Chinese universities, like state-owned enterprises, are plagued with party committees, and the university party secretary normally outranks the president. While a few extraordinary party secretaries are central to their universities’ success, as a rule this system of parallel governance limits rather than enhances the flow of ideas.

The freedom to pursue ideas wherever they may lead is a precondition for innovation in universities. But by any comparative measure, faculty members in Chinese institutions have little or no role in governance. Indeed, it was not a good sign when China’s then-vice president (now president), Xi Jinping, visited China’s leading universities in June 2012 to call for increased party supervision of higher education.

**Perhaps Absolute** innovation, like absolute leadership and power, is overvalued. In industry, as in education, China can enjoy for some time what Joseph Schumpeter called the latecomer’s advantage: the ability to learn from and improve on the work of one’s immediate predecessors.

Certainly, China has shown innovation through creative adaptation in recent decades, and it now has the capacity to do much more. But can China lead? Will the Chinese state have the wisdom to lighten up and the patience to allow the full emergence of what Schumpeter called the true spirit of entrepreneurship? On this we have our doubts.

The problem, we think, is not the innovative or intellectual capacity of the Chinese people, which is boundless, but the political world in which their schools, universities, and businesses need to operate, which is very much bounded.

Regina M. Abrami is a senior fellow at the Wharton School, the director of the Global Program at the Lauder Institute, and a senior lecturer in political science at the University of Pennsylvania. William C. Kirby is the Spangler Family Professor of Business Administration at Harvard Business School and the T.M. Chang Professor of China Studies at Harvard University. F. Warren McFarlan is the Baker Foundation Professor and the Albert H. Gordon Professor of Business Administration, Emeritus, at Harvard Business School. They are the authors of *Can China Lead? Reaching the Limits of Power and Growth* (Harvard Business Review Press, 2014).

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