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Practical Engagement: Drawing a Fine Line for U.S.-China Trade

The U.S. strategy of engaging China economically has generated substantial theoretical debate about potential security benefits and risks but a good deal less in the way of practical policy recommendations. For proponents of economic engagement with the People's Republic of China (PRC), trade not only is good for its intrinsic value but also is anticipated to bring China further into the international order and make it a more responsible actor.[1] Proponents of engagement expect trade to empower more internationalist and cooperative elements within Beijing, whereas critics fear that trade will not moderate Chinese behavior. They warn that the proceeds that China has gained in more than 25 years of rapid economic growth could one day be turned against the United States. The trade, investment, and technology provided by the United States could all make China militarily more powerful than it would otherwise be. In response to the U.S. decision to grant China permanent normal trade relations, Representative Dan Burton (R-Ind.) may have summed up such fears most candidly: "This will give them [the Chinese] more money to buy the rope with which to hang us. They have the largest army in the world, and it's going to get bigger and we're going to pay for it."[2]

The logic linking trade and Chinese military modernization appears straightforward. During the Cold War, tight control over technology transfer was considered a key part of preventing the Soviet Union and the Eastern Bloc countries from improving their military capabilities. With the Cold War behind us, some now see China as the most likely potential great-power

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competitor to the United States and thus are tempted to try to restrict the flow of advanced commercial technologies that may improve the ability of the People's Liberation Army (PLA) to threaten Taiwan or project power in Asia. Others argue more expansively that the United States should not engage in any activities that help China's economy grow, given that increased wealth could be used to expand Chinese military capabilities.

As policymakers choose which measures to apply to the security challenges that might emerge from the bilateral economic relationship, they should address three concrete and interconnected questions: (1) Do U.S. trade and investment provide critical inputs to Chinese growth and military development that could not be found elsewhere in the global economy? (2) If these critical inputs exist, what measures can the United States take to limit China's access to them? (3) Conversely, what U.S. trade and investment policy could be pursued to ensure U.S. security and to help frame China's growth in a nonantagonistic direction?

Excessive unilateral export controls risk harming U.S. innovative capacity.

These three questions suggest a new paradigm for analyzing the issues of security and trade as well as restrictions on the transfer of technology between China and the United States. The global economy, technological development, and the relationship of technological development to government sponsorship and procurement have all changed. The reality is that the economic relationship between the United States and China is perhaps the most conspicuous and important example of how difficult it has become to design successful export control policy in a globalized world.

The most effective response to this new paradigm is to maintain the embargo on the sale of military items and a small but very crucial handful of dual-use items, while relaxing controls on most advanced commercial technologies. This policy will further integrate China into the international system and, more importantly, help preserve the U.S. comparative advantage in technological innovation, thus assuring continued U.S. technological superiority. The arms and defense technology embargo that the United States and the European Union imposed on China after the 1989 Tiananmen Square massacre should remain in place. Despite recent French claims that the EU's ban is outdated and should be lifted, the United States should continue to cooperate with and, when necessary, pressure European suppliers to maintain a common policy with the United States. The United States has taken some tentative steps toward lifting controls on the sales of advanced commercial technologies, such as lifting the ban on the export of some types of supercomputers, but more can be done to ensure that U.S. technology producers are able to exploit rapidly changing markets. In a globalized world, excessive unilateral export controls risk harming U.S. access to critical markets and, therefore, U.S. innovative capacity.

Bilateral Trade, Technology, and the Rise of China

Arguments about the security risks posed by U.S.-China trade are predicated on the fear that the United States, as China's largest export market and among the top three sources of foreign investment, provides China both with money and particularly advanced technologies. Although economists may argue about the actual size of the trade deficit,[3] these debates are at the margins of the widely accepted line of reasoning that connects trade, the economy, and military capability.[4] The concern is that China's rising prosperity makes it possible for the government to devote more resources to all of the country's domestic programs, including spending on military modernization, which rose throughout the 1990s and is increasing again in 2004 by 11.6 percent.[5] Foreign investment, with total utilized U.S. investment of $5.4 billion in 2002,[6] and a positive trade balance allow China to accumulate significant foreign reserves (more than $403 billion by the end of 2003), some of which have been used to purchase advanced weapons systems from Russia and Israel, as well as from other foreign suppliers.

During much of the 1980s and early 1990s, Washington particularly feared that commercial ventures in China would divert dual-use technologies to the military or to other countries, especially Iran, Iraq, Pakistan, and North Korea. Supercomputers, satellites, and machine tools all came under scrutiny and regulation. In the late 1990s, the issue of dual-use technology broadened. Attention has been directed not only to the diversion of dual-use technologies to the military but also to the role that U.S. and other foreign firms play in developing China's indigenous commercial technology capabilities that could eventually "spin on" to the defense science and technology (S&T) system.[7]

Technologically obsolete, geographically isolated, and dominated by moribund state-owned enterprises, China's military S&T system traditionally has lagged behind the technology used by the country's commercial producers. An innovative civilian sector in China might change this imbalance, however, by creating what James Mulvenon has called the "digital triangle"—close cooperation among government research and development (R&D) institutes, the military, and commercial enterprises involved in information technology (IT)—to develop advanced technologies for civilian and military use.[8] Seeking access to China's domestic market, U.S. firms often cooperate with Chinese producers and, as a result, may transfer technologies or management skills that could improve China's capacity to coordinate complex military systems.

Finally, opponents of engagement with China fear that technology transfers and foreign direct investment might create a second-order security problem: the threat of technological dependence on China (or on manufacturers located in China). In the case of semiconductors, for example, the fear is that the location of manufacturing facilities in China might prevent the U.S. Department of Defense and U.S. intelligence agencies from securing "first access and assured access to secure advanced chip-making capability."[9]

What Does the United States Contribute to China's Military Modernization?

Although such trends give U.S. defense analysts legitimate reason to fear the impact of engagement with China, there are in fact few gains tied explicitly to bilateral U.S.-China trade that facilitate critical growth in China's military capabilities. As the 2002 U.S.-China Security Review Commission report notes, "It is difficult to document any direct connection between China's bilateral trade surplus and the PRC military budget."[10]

Part of the misconception about the potential military impact of U.S. trade derives from the focus on bilateral numbers. To come to conclusions fairly about what security benefits China derives from trade, bilateral trade between the United States and China must be placed in the context of the PRC's participation in the wider global economy. China has a large trade surplus with the United States but not with the world as a whole, running deficits with Taiwan, Korea, Thailand, and Malaysia. China's overall global trade surplus is not especially large, approximately $25 billion in 2003, and it has fluctuated from year to year. Limiting or denying access to the U.S. market may cause some economic damage but probably less than might be imagined. For example, such restrictions will have relatively little impact on China's overall trade balance. Because China imports the machine tools needed to manufacture export products, if China exports fewer sneakers to the United States, it will import fewer stamping machines and less rubber from other countries, so China's overall trade balance would remain about the same.

In addition, given China's increasingly central place in global supply networks and its role as the final assembly point for many exports originating throughout the region, the pain inflicted by trade sanctions is bound to be felt by more countries than just China.[11] Japan, Taiwan, and Korea produce many of the higher-value capital goods used to produce Chinese exports, and these countries would thus also be hurt by U.S. trade restrictions.

Chinese defense planners clearly are trying to acquire civilian technologies, such as microprocessors and telecommunication equipment, and to convert them to military use, but it is not clear that there is much the United States can do to prevent spin on. Commercial dual-use technologies are not unique to the United States, and currently, only Washington considers the transfer of these technologies to China to be a potential security threat. The Europeans have few direct security interests in a potential conflict in Asia, especially across the Taiwan Strait. Some defense analysts in Tokyo see the rise of China as a potential threat, but Japan continues to develop commercial and political ties with Beijing and to see its own economic security as highly dependent on the development of the Chinese market.[12]

> **The Chinese defense industry's ability to absorb new technologies is limited.**

The case of semiconductors may best exemplify the difficulties of controlling the export and use of advanced information technologies. Although U.S. defense analysts fear that the migration of integrated circuit manufacturing capability to Shanghai during the late 1990s may assist China's development of long-range, precision-strike capabilities; better command-and-control systems; and integrated air defenses, the United States has been unable to reach agreement with its allies and friends on a common multilateral export policy toward China.[13] The United States is the only member of the Wassenaar Arrangement on Export Controls for Conventional Arms and Dual-Use Goods and Technologies that considers China's acquisition of these capabilities a cause for concern. European and Japanese export control authorities have licensed sales of semiconductor manufacturing equipment to China that is at least two generations more advanced than the threshold stipulated by the Wassenaar agreement. When the United States has banned or slowed exports to manufacturers in China, European and Japanese suppliers quickly stepped in to make the sale.

The United States' fear of spin on may be misplaced for at least two reasons. First, Beijing does not have to rely on commercial technology to improve its military capabilities over the next several years. China is already able to purchase relatively advanced destroyers, fighter aircraft, submarines, antiship missiles, and torpedoes from Russia and continues to do so.

Second, the limited technological level of China's "new economy" and the ability of the Chinese defense industry to absorb new technologies, developed abroad or domestically, diminish the impact of the application of commercial technologies on the defense sector. Even after two-and-a-half decades of reform in China, ill-defined property rights, financial inefficiency, and bureaucratic interference characterize the civilian S&T system.[14] Although S&T spending gradually increased in the 1990s, China remains far behind most of the developed world in R&D funding. The PRC's gross expenditure in R&D as a percentage of gross domestic product (GDP) reached 1 percent in 2000, as compared to 2.0–2.5 percent of GDP spent on R&D by most developed countries.[15]

The diffusion of imported technologies historically has also been one of the weakest components of the Chinese S&T system. This weakness has been the result of bureaucratic "stove-piping"—the separation of scientists and research institutes in one bureaucracy from those in another that prevented the exchange of ideas and technology—as well as Beijing's chronic underfunding of the diffusion process. Even in commercial sectors with a relatively direct link to potential military capability, it is difficult to find evidence that new skills and technologies migrated to the defense side of production and made a direct impact on military modernization.

Commercial innovation is now one of the central pillars of U.S. military superiority.

Twenty years of Chinese cooperation with U.S. and other foreign aircraft manufacturers in the aviation sector, for example, have had a limited effect on Chinese military aircraft programs.[16] To be sure, foreign cooperation has probably helped bolster, in broad terms, the production processes and management practices of major Chinese aviation producers in Xi'an, Chengdu, and Shenyang. Yet, despite the joint ventures between major international aviation firms and Chinese aviation firms for the past 20 years, China's principal aircraft manufacturers have consistently failed to produce modern military aviation platforms—one of the main reasons for the Chinese military's purchase of such aircraft from Russia. Furthermore, reports indicate that China's aerospace industries have been unable to capitalize on what little technology was included in the transfers coming from these joint ventures. China's aviation industry remains beleaguered by redundant infrastructure and managers and a workforce with weak skills. This sector's systemic problems will limit any potential spin-on benefits and so continue to constrain rapid modernization of military aircraft production.

Finally, the likelihood that the United States will grow dependent on any one country, much less China, for any one product, especially semiconductors, is exceedingly small. The fear of technological dependence was high in Washington during the early 1990s when, for example, the United States relied on a handful of Japanese companies for flat-panel displays. U.S. dependence on one supplier never became a serious threat, however, because within less than 10 years, dozens of companies in a number of countries manufactured flat-panel displays. China is years away from having a position in the global semiconductor market that is equivalent to Japan's position in the 1990s in the production of flat-panel displays. In 2000, China produced 1 percent of the world's computer chips, and that figure is expected to rise to 2–3 percent in 2005;[17] currently, approximately 80 percent of the chips used in China are imported.[18] China has ambitious plans for the expansion of semiconductor manufacturing capacity (19 new foundries are already in operation or are planned), but U.S. dependence on China is not an immediate threat or inevitable outcome.

What Can the United States Do?

Although the bilateral trade surplus does not provide unique inputs to Chinese military modernization, policymakers still must decide how they are going to manage the potential security risks present in increasing economic and technological flows between the United States and China. U.S. policymakers have been overly focused on the long-term challenges of commercial technology spin on and the prospect of dependence on the Chinese market rather than on how the United States should respond to the systemic changes that have reshaped the global economy and technological innovation as well as the relationship of technological development to government sponsorship and procurement.

The real long-term threat to U.S. security is the potential decline of the innovative capabilities that emerge from the interaction of U.S. industries and research universities, as well as the competition among U.S. commercial producers, in domestic and foreign markets. For this reason, the predominant focus should be on continued innovation as the United States moves into new technology areas and gradually reduces controls over older technologies. Toward this end, U.S. trade policy toward China should do two things: combine control over a very limited number of critical dual-use technologies and aggressively foster U.S. technological competitiveness, including placing greater pressure on China to allow U.S. firms to have fair access to the domestic technology market. Access to the Chinese market is essential to U.S. industrial competitiveness; and Beijing, two years after accession to the World Trade Organization (WTO), continues to erect barriers to U.S. high technology products.

Control

A successful export control policy will focus on how the Chinese military may use any dual-use technology acquired from the United States as well as whether the use of this technology would have any significant impact on the military outcome of a possible conflict. For example, does the import of microprocessors from U.S. companies enable the PLA to develop military capabilities that would otherwise be beyond its reach within a limited time period?[19] Currently, the United States is most concerned with military technologies that could significantly improve China's ability to coerce Taiwan into negotiating with the mainland on Beijing's terms and, more generally, improve the PLA's limited power-projection capabilities in maritime East Asia, which might allow Beijing to seize and hold disputed territories against regional forces as well as deter or complicate a U.S. intervention on behalf of Taiwan. As a result, beyond the embargo on sales of all military items, lethal and nonlethal, on the U.S. Munitions List imposed after the Tiananmen Square massacre, U.S. policy should try to prevent the export to China of dual-use technologies that would aid the PLA in four categories: battle-space awareness, precision-strike munitions, command and control of joint military operations, and information warfare.[20]

All four of these categories are tightly tied to China's possible desire to launch a rapid, coordinated air-and-missile attack on Taiwanese command-and-control facilities, military air bases, and naval facilities as well as key leadership targets on the island—a coercive use of force that some believe to be the most likely conflict scenario across the Taiwan Strait.[21] Greater battle-space awareness could increase the PLA's certainty of the location of its own and enemy troops, as well as those troops' current and upcoming activities. With precision-guided munitions, Beijing could hope to destroy leadership or high-value military targets accurately, quickly, and with a minimum of civilian casualties. Effective joint operations could ensure that the PLA Navy, Air Force, and missile forces (Second Artillery) would all work together seamlessly, creating a more deadly attack. Finally, information-warfare capabilities might allow the PLA to degrade Taiwan's (and possibly the United States') own battle-space awareness and perhaps even create civil chaos in Taiwan.

To limit these four capabilities, only a small number of specific technologies should be controlled, including defense-related systems integration techniques and software, the high-resolution commercial imagery technologies needed for reconnaissance satellites, commercial sensor and laser technologies, and commercially applicable guidance and navigation technologies. U.S. export control policy is likely to be relatively effective in each of these areas because the technology is militarily significant and the United States has unique technological capabilities in each of these systems or is able to build multilateral support for control.

As a key component in battlefield awareness, systems integration techniques could substantially increase China's ability to launch an attack on

Taiwan. In commercial sectors, systems integration might create a new product or process by integrating software and hardware. On the battlefield, these techniques allow commanders to integrate hundreds of various communication, computer, and personnel management systems to produce new and more deadly combat capabilities. The PLA's capabilities in systems integration are currently weak, with only minor successes in linking various components into a single product.[22] Because the field is dominated by established defense contractors such as Lockheed Martin and a few defense-oriented start-up companies, not commercial IT producers, keeping network and core systems integration software out of the hands of the Chinese military is a realistic goal.[23]

Globalization of R&D of new technologies has made their control much more difficult.

The ability to buy high-resolution satellite imagery from private companies has essentially leveled the playing field in certain aspects of image-based intelligence. China or any other state or nonstate actor can currently purchase 1-meter resolution images from vendors in a few countries, including Russia and India. In any war-fighting scenario, however, timeliness remains an issue, as the PLA would want access to images as quickly as possible.[24] Being denied advanced imagery technology will perpetuate China's dependence on foreign suppliers and leave Beijing vulnerable to the type of counterintelligence used by the United States in Operation Enduring Freedom. During that campaign, the United States paid millions of dollars to a commercial firm—Space Imaging—for exclusive rights to photographs taken above the war zone, primarily to deny Al Qaeda the ability to monitor U.S. troop movements.[25] Without dedicated high-resolution imaging systems of its own, China faces the risk of either battlefield blindness during any operation or reliance on its own lower-resolution imaging satellites.

Sensors are an integral part of "network-centric" warfare, because they can detect individual vehicles, ships, or aircraft well beyond visual range and also provide targeting information on a near real-time basis. Many of these sensors are commercial, off-the-shelf items that have a small likelihood of being controlled effectively, but the United States maintains a technological lead in sensor input as well as in the creation of network nodes. Export control policy should be concentrated on precisely these areas.[26] Lasers, which the PLA could use to improve its own targeting and to confuse the targeting of U.S. precision-guided munitions, should also be controlled, but the United States will have limited impact on most of these technologies. China is developing its own indigenous laser capabilities that it can use for targeting or target interference.[27] More sophisticated lasers used for directed-energy weapons and space-object tracking will not be widely available outside of the United States in the next 10 years and thus are more susceptible to control.

Finally, export controls that have been in effect since the beginning of the Cold War on the guidance systems for intercontinental ballistic missiles (ICBMs) have probably delayed China's ability to deploy more advanced ICBMs and should thus be maintained. By contrast, the United States will be able to exert little control over the guidance and navigation technologies that could be used in a potential short-range ballistic or cruise missile attack on Taiwan. The guidance systems found in commercial aircrafts are light and accurate enough to control a cruise missile, and the widespread availability of such guidance equipment means it cannot be effectively controlled.[28] ICBM guidance equipment is more sophisticated and only available from a very few suppliers.

What is notable about the list of technologies described is how few of them the United States can hope to control. Preventing the export of a handful of advanced commercial technologies to China, although a critical tool, is a small part of a larger trade strategy focused on fostering future innovation in U.S. companies. Commercial innovation is now one of the central pillars of U.S. military superiority. Excessive export controls harm U.S. technological innovation and thus pose a more systemic threat to long-term U.S. security than the loss of any individual system would.

Technological Innovation

The brevity of the list of technologies the United States should try and control is the product of two processes that have occurred over the last 10 years: the increasing importance of commercial producers in R&D and the globalization of technological innovation. Unlike during the Cold War, government spending and procurement no longer play a dominant role in commercial R&D, especially in IT sectors. In the 1970s, the major semiconductor manufacturers were essentially government defense contractors; the Pentagon was the source of almost 50 percent of the funding for semiconductor R&D from the 1950s to the 1970s.[29] In 2002, according to David Rose, director of export, import, and information security affairs at Intel Corporation, all government procurement (including Defense Department contracts) accounted for less than 1 percent of U.S. semiconductor sales, and that number is declining.[30]

With the diminishing importance of government funding, private firms play a greater role in maintaining the United States' national security. Military capabilities are closely tied to the innovative capabilities of commercial producers. According to a 1999 Defense Science Board Task Force on Globalization and Security, the Defense Department relies "increasingly on the U.S. commercial advanced technology sector to push the technological envelope and enable the [d]epartment to 'run faster' than its competitors."[31]

Private firms have been the main engine of the globalization of technological innovation. During the 1990s, multinational corporations dispersed manufacturing, research, and development around the world. Information technology has made it possible to locate all aspects of the R&D process throughout the world, and U.S. companies' use of licensing agreements, R&D alliances, and foreign subsidiaries has expanded.[32] Countries such as China and India that were once outside the mainstream of technological innovation are now important players in the global process. As a result, there is now an enormous flow of capital, people, and ideas between the United States and the rest of the world. U.S. firms establish development laboratories in Beijing; Indian scientists return from Silicon Valley to set up their own firms in Bangalore; and doctoral students from throughout Asia work in research laboratories at universities all over the United States.

Punitive technology policy would eventually weaken U.S. military capabilities.

The globalization of the R&D of new technologies has made their control much more difficult. During the 1980s, faced with security challenges from the Soviet Union or economic competition from Japan, U.S. policymakers created export controls designed to prevent the transfer of a limited number of critical technologies between fundamentally separate national economies. Technological innovation was territorially bound, with little cooperation, contact, or exchange between scientists in California and Moscow—or even Tokyo. Today, in stark contrast, the personal interaction and sharing of knowledge between scientists in different parts of the word is a critical driver of technological innovation.

The correct response to these increasing flows and other countries' recent relative gains is not to limit the technological activities of U.S. firms. Punitive technology policy would seriously damage the competitiveness of U.S. industries and, given the Defense Department's reliance on U.S. commercial producers for the next generation of transformational technologies, eventually weaken U.S. military capabilities. Rather, U.S. companies must be able to participate in the global market and help shape the emerging technological trajectory in India and China. Accordingly, unilateral export controls on commercial technologies harm U.S. industry by allowing Japanese, European, Korean, and other national competitors to fill the marketplace. Eventually, unilateral export controls could create a degree of dependence on the countries that dominate these markets and hurt the Defense Department's access to advanced technologies.

Many of the risks of the commercialization and globalization of R&D are uncontrollable, but the United States should be ready to try to exploit the possible security gains of exporting high-technology commercial products to China. U.S. sales to China promote dependence on U.S. technology—something the Chinese worry about—and give U.S. intelligence agencies knowledge of the potential weaknesses in the technologies the Chinese have purchased from abroad, as well as how they might be exploited in a conflict or for more routine information collection. U.S. technology firms located in or exporting to China may also crowd out Chinese producers. The presence of foreign firms offering high salaries to the best Chinese scientists and engineers makes it more difficult for the PRC to attract technical talent to its own defense R&D programs, which hampers Chinese efforts to develop a spin-on system and thus maintains the technological gap between U.S. forces and the PLA. Chinese officials have complained, for example, about Intel's recruitment of some of the country's top engineering graduates.[33]

The reality is that systemic U.S. technological superiority depends on engaging China.

In addition to fostering domestic policies focused on expanding private and public R&D, improving mathematics and science education, and increasing investment in technology infrastructure, the U.S. strategy must be built on fair access to international markets, particularly China. U.S. trade officials should continue to push China to live up to its WTO commitments. Chinese technology producers are finding new ways to exclude foreign penetration of their markets through the use of rebates of value-added taxes; the failure to provide adequate protection of intellectual property rights (IPR); and the definition of new standards in digital video disks, cellular phones, and wireless technologies. A March 2004 letter from Secretary of State Colin Powell, Secretary of Commerce Don Evans, and U.S. Trade Representative Robert Zoellick protesting regulations requiring all wireless imports to contain data-encryption technology now produced only in China is an example of the type of pressure that the United States should be prepared to use.[34] U.S. technology trade with China will need to be predicated on the country's adherence to the commitments defining its WTO membership: transparency, nondiscrimination, elimination of trade barriers, and IPR protection.

Preserving Technological Superiority in a Globalized World

Commercial engagement with China is not an immediate security risk to the United States. The direct links between bilateral trade and military modernization are tenuous. Moreover, the long-term economic and national security of the United States is progressively tied to U.S. participation in the global economy. This link is especially true in high-technology sectors, in which U.S. military predominance is increasingly dependent on the innovativeness of commercial producers who look more frequently to participation in the Chinese market as being critical for not only manufacturing and sales but also R&D.

The problem of designing effective export control policies for China exemplifies paradigmatic changes in the relationship among technology, trade, and national security since the fall of the Soviet Union. The globalization and commercialization of R&D allows states that are potentially hostile to the United States to acquire off-the-shelf technologies for sensors, information processing, and precision guidance from suppliers in Europe, Japan, Korea, and Taiwan. Because the United States cannot hope to limit the availability of most of these technologies, export controls are a secondary part of a larger technology policy to preserve U.S. technological superiority. The United States' primary focus must be to exploit the current generation of technologies and develop the next one better and faster than any other country.

Admittedly, commercial engagement with China presents a range of economic and security challenges for the United States. Recent debates about outsourcing or the loss of manufacturing and white-collar jobs are only the beginning of what will be a long and difficult process of accommodating the growth of the Chinese economy. In the security realm, the Taiwan Strait remains an explosive flash point, and ambiguity exists about the PRC's future intentions toward the U.S. presence in Asia.

Given uncertainty about Beijing's future intentions, many security analysts will be tempted to see any increase in Chinese power as a threat to the United States, producing an essentially untenable policy proposition: economic warfare with China. The truth is, however, that the danger China might pose in 20 years will depend on its behavior as well as its power. Furthermore, it is not difficult to imagine circumstances, such as Beijing's recent support for the war on terrorism and involvement in counterproliferation efforts on the Korean peninsula, under which a powerful and cooperative

China would be more in U.S. interests than a weak and disruptive one. Beyond these more general arguments in support of engagement, the reality is that systemic U.S. technological superiority depends on aggressively maintaining its own engagement in all international markets, including China.

The ideal outcome for the United States might be something like the status quo: a relatively stable, weak, and cooperative China. It would be almost impossible, however, for U.S. decisionmakers to agree on some measure of how powerful China should become. Moreover, given the size of the Chinese domestic and Asian regional economies, it would be even more difficult to use trade policy as a way to limit China to that level of growth. Without egregious behavior by Beijing, other states would not adopt a policy of economic containment, forcing the United States to wage its economic warfare alone.

Export controls will play a smaller role than they did during the Cold War.

China's support on a range of issues important to the United States would surely end if Beijing felt that Washington was trying to damage the Chinese economy. The pressing security concerns of the United States have drastically changed as a result of the September 11 terrorist attacks on the Pentagon and the World Trade Center. In Washington, the attacks shifted focus away from the threat posed by potential peer competitors to that posed by failing states, terrorists, and weapons of mass destruction. The United States now looks to other great powers to help manage common challenges, and China is now more widely viewed as a cooperative partner. As Powell recently stated, "[W]e welcome a global role for China, so long as China assumes responsibilities commensurate with that role."[35]

Because the Chinese Communist Party's domestic legitimacy rests on its ability to manage the economy, create new employment, and adjust to disruptions created by reform, Beijing must work hard to ensure a peaceful international environment supportive of growth. Good relations with the United States are central to this effort. The more dependent China becomes on the U.S. market, the greater the incentives for Beijing to exercise restraint and behave responsibly. Trade relations generate domestic constituencies that call for continued cooperation with the United States and eventually inhibit Beijing's flexibility (similar to what has occurred between business interests and the government in the United States).

China's restraint, of course, has limits. Economic ties will not provide much of a bulwark against more aggressive behavior if Beijing feels challenged in other areas that are closely tied to the legitimacy of the regime, especially in the case of Taiwan. Yet, responsible international behavior is part of a 20-year trend that bilateral economic relations will allow the United States to continue to encourage.

Engagement with China should proceed in parallel with the continued embargo of military items and with export controls on a few dual-use items. These controls should be designed to prevent or slow PLA gains in the development of increased battlefield awareness, precision-guided weapons, information-warfare capabilities, and greater command and control of joint military operations. As technologies that could enable the PLA to develop these capabilities, defense-related systems integration techniques and software, high-resolution imagery technologies needed for reconnaissance satellites, sensor and laser technologies, and guidance and navigation technologies should all be tightly controlled.

In a globalized world, export controls will play a smaller role than they did during the Cold War in U.S. efforts to maintain technological superiority. The preservation of the United States' comparative advantage in technological innovation will require that the United States be engaged in global markets, particularly China. The alternative strategy—staying at home and stockpiling the current generation of technologies—could lead to the erosion of U.S. systemic advantages and ultimately to the rise of other technologically ambitious states as the leaders of the future.

Notes

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