



# Enough is Enough: Confronting Chinese Innovation Mercantilism



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## EXECUTIVE SUMMARY

In the last decade, China accumulated \$3.2 trillion worth of foreign exchange reserves and now enjoys the world's largest current account balance. In 2011, it ran a \$276.5 billion trade surplus with the United States. This “accomplishment” stems largely from the fact that China is practicing economic mercantilism on an unprecedented scale. China seeks not merely competitive advantage, but *absolute advantage*. In other words, China's strategy is to win in virtually all industries, especially advanced technology products and services. One may argue that all countries do this and assert it is the essence of competition. But China's policies represent a departure from traditional competition and international trade norms. Autarky, not trade, defines China's goal. As such China's economic strategy consists of two main objectives: 1) develop and support all industries that can expand exports, especially higher value-added ones, and reduce imports; 2) and do this in a way that ensures that Chinese-owned firms win. It is time for policymakers in the United States and other countries to begin responding to today's reality for Chinese mercantilism represents a fundamental threat to not only the U.S. economy, but to the entire system of market and rules-based globalization.

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Because China is so large and because its distortive mercantilist policies are so extensive, these policies have done significant damage to the United States and other economies. The massive subsidies to keep production artificially cheap both reduce the cost of Chinese labor and move the world production system more towards labor and away from capital, reducing global productivity. The theft of intellectual property and forced technology transfer reduce revenues going to innovators, making it more difficult for them to reinvest in R&D. The manipulation of standards and other import restrictions balkanizes global markets, keeping them smaller than they otherwise would be, thereby raising global production costs. Further integration of global supply chains that link the United States and China could be good for both nations but not if Chinese policies continue to be based on absolute advantage and mercantilism. In this case, the results will be more of the same: the loss of U.S. industrial and high-tech output, and the jobs and GDP growth that go with it.<sup>1</sup> The logical evolution of this path for America is something akin to what happened to Great Britain: an economy that was once great but now suffers from a hollowed-out traded sector and hence now experiences great difficulty in creating good jobs and rising living standards.

China's goal of absolute advantage through innovation mercantilism runs counter to the effective functioning of the global trading system, which is grounded in the notion of competitive advantage: nations finding what they are good at or can be good at and exporting products and services in these areas to pay for the imports of goods and services they are not as good at producing. Running an integrated global trading system that

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maximizes global economic welfare is impossible when the second-largest economy rejects the fundamental premise. As such, China's autarkic goals and mercantilist policies are fundamentally at odds with the principles of the open and rules-based international trading system that China committed to when it elected to join the World Trade Organization (WTO) in 2001. Countries that join the WTO make a commitment to a trading system, not an exporting system. Rolling back Chinese innovation mercantilism, while continuing to integrate China into the rules-based system of market-led global trade and investment, should be a key priority of U.S. (and European) trade policy.

The stakes could not be higher, for this conflict is not just about China, but about the future of the entire global trading system, especially as developing nations become more active participants in it. China's autarkic and mercantilist approach reflects a fundamental ideological difference between how China sees its role in bringing about state capitalism and the traditional western model of capitalism supported by global organizations such as the WTO. As China increasingly touts the superiority of the "Beijing consensus" over the "Washington consensus" (the latter rests on the premise that market forces work and governments should play only a minimal role in promoting the interests of their countries' companies and workers), there is a real risk that the former, not the latter, will become the guiding star of other nations around the globe seeking to boost their living standards. We already see this in nations like Brazil and India that are looking to emulate China by ramping up mercantilism. If this happens, it will be extremely difficult to maintain a global trading system that operates along the lines economists originally envisioned. In 1990 Francis Fukuyama wrote his well-regarded book *The End of History and the Last Man* which postulated that "a true global culture has emerged, centering around technological driven growth and the capitalist social relations necessary to produce it and sustain it."<sup>2</sup> Fukuyama did not, and perhaps could not, have foreseen that out of the ashes of the authoritarian anti-capitalist regimes of the right and left could emerge a powerful and successful alternative to free-market capitalism, in this case state capitalism as embodied in what could be termed the Beijing consensus.

If free trade is to prevail over the Beijing consensus, it's not enough to tout the superiority of the Washington consensus, for it is in fact now a deeply flawed model for growth and prosperity. It places too many limitations on legitimate government roles to spur innovation and competitiveness. But the Beijing consensus is also not only seriously flawed, it is a fundamental threat to global economic integration. Instead of a choice between these two schools of thought, it is time to consider an alternative model, what might be termed the "Helsinki consensus." Finland and many other countries are fundamentally committed to a vision of global integration and free trade, but at the same time recognize that "good", non-mercantilist innovation policies (e.g. funding for applied industrial research and technology transfer, support for STEM education, R&D tax incentives, national technology strategies, etc.) are critical to enable them to effectively compete in global markets. They focus on both consumer and producer welfare and recognize that globalization is an unalloyed good but only if other nations also play by the rules. Yes, the Washington Consensus suggests funding basic research and education, but it is loath to develop a real national innovation strategy focused on key technologies and industries. It also assumes companies compete against other companies and ignores the fact that

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countries also compete, whether through legitimate or dubious means. The World Bank, IMF, and other multilateral organizations need to start advocating the Helsinki consensus around the world so that nations are not forced into an unproductive choice between the Washington consensus and the Beijing consensus. For if their choice is so limited, too many will default to the latter, especially as they look at the respective economic performances of the United States and China.

### The Nature of Chinese Mercantilist Policies

In contrast to American economic policy, Chinese economic policy is not about maximizing short-term consumer welfare through free markets. Rather it is about maximizing long-term producer welfare and achieving autarky. And it's a particular kind of producer welfare where the owner of the factors of production is the Chinese Communist Party. As such, the focus on producer welfare is tied not just to a particular theory of economic growth but to direct self-interest of the Chinese government and officials in it.

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*After the MLP in 2006, China was to seek the capability to master virtually all advanced technologies, with the focus on Chinese firms gaining those capabilities through indigenous innovation.*

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To maximize producer welfare, China has put in place an array of mercantilist policies whose principal focus is on helping the home economy in an unfair manner at the expense of the global economy. For Chinese mercantilists, it is not enough to compete to make a better product. Instead, they seek destroy the competition and make the only product.

There are two distinguishing features of these mercantilist policies. The first is their scope and size. While virtually all governments have crafted economic development policies to boost competitive advantage, China has developed the most comprehensive set of policies, with most of them violating the spirit, if not the letter of the law of the WTO. The second is their focus on Chinese firms, rather than Chinese establishments (e.g., Chinese factories and offices owned by Chinese or foreign firms). Most governments provide incentives to any establishment within their borders, regardless of its nationality. For Chinese leaders, at least since after 2006, Chinese firms are the key. Chinese mercantilist policies champion Chinese firms in two ways: the first is through policies designed to unfairly spur exports and reduce imports that help Chinese firms but also foreign firms in China. These policies include currency manipulation, relative high tariffs (three times higher than U.S. tariffs); and tax incentives for exports. The second is through policies designed to help Chinese firms while discriminating against foreign establishments in China. These policies take numerous forms including discriminatory government procurement; controls on foreign purchases designed to force technology transfer to China; land grants and rent subsidies to Chinese-owned firms; preferential loans from banks; tax incentives for Chinese-owned firms; cash subsidies; benefits to state-owned enterprises; generous export financing; government-sanctioned monopolies; a weak and discriminatory patent system; joint-venture requirements; forced technology transfer; intellectual property theft; cyber-espionage to steal intellectual property (IP); domestic technology standards; direct discrimination against foreign firms; limits on imports and sales by foreign firms; onerous regulatory certification requirements; and limiting exports of critical materials in order to deny foreign firms key inputs.

In essence, China has long worked to attract foreign companies to operate there, often using unfair or illegal practices. And it is now targeting help to Chinese-owned firms.

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## The Shift to “China Inc.” Through Indigenous Innovation

Until the mid-2000s China actively encouraged foreign direct investment in the country through a vast array of incentives, many of them mercantilist and unfair in nature. While the consequences of the mercantilist policies might not have always been good for the U.S. economy, and especially for many production workers in traded sectors, U.S. multinational corporations benefited from access to a low-cost production platform. And Americans in their role as consumers benefited from lower cost goods. And while China occasionally engaged in policies that brought complaints from U.S. industry, by and large U.S. industry was satisfied with the relationship.

In 2006, that began to change. For that was when China made the strategic decision to shift to a “China Inc.” development model focused on helping Chinese firms, often at the expense of foreign firms. Chinese leaders decided that attracting commodity-based production facilities from multinational corporations (MNCs) was no longer the goal, as it had been since the early 1980s when Deng Xiaoping made the decision to open China up to international investment. The path to prosperity and autonomy was now to be “indigenous innovation” (or in Chinese, *zizhu chuagnxin*) with Chinese firms the focus.<sup>3</sup>

The seminal document advocating this shift was “*The Guidelines for the Implementation of the National Medium- and Long-term Program for Science and Technology Development (2006-2020)*.” The so-called “MLP” sought to “create an environment for encouraging innovation independently, promote enterprises to become the main body of making technological innovation and strive to build an innovative-type country.”<sup>4</sup> This was much more than a strategy to target some key areas where China had some preexisting capabilities. Rather, the MLP “must be made a national strategy that is implemented in all sectors, industries, and regions so as to drastically enhance the nation’s competitiveness.”<sup>5</sup> The MLP called on China to “master core technologies” in virtually every area Chinese state planners could imagine. Included were some 402 technologies, from intelligent automobiles to integrated circuits to high performance computers. After the MLP in 2006, China was to seek the capability to master virtually all advanced technologies, with the focus on Chinese firms gaining those capabilities through indigenous innovation.

One way China sought to implement indigenous innovation was through regulations requiring the creation of catalogues of innovative products the central government would rely on when making procurement decisions. To qualify for inclusion the product not only had to be made in China, the intellectual property on which it was based had to be Chinese or transferred by a non-Chinese firm to China. Applicants were asked about whether their shareholders were foreign or domestic, presumably to ensure that Chinese-owned firms would be the main beneficiaries. Chinese agencies took steps to rescind the official rules in July 2011 in response to intense foreign pressure. This policy was an important, but not the only, manifestation of China’s shift via the MLP to China, Inc.

Since 2006, China has shifted more to the Japanese and Korean model of development, based on helping its own domestic companies grow by moving up the value chain and gaining global market share. As such, conflict now exists not just between American and Chinese workers; it’s between American companies and Chinese companies, just as it did

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between Japanese companies and American companies in the 1980s and early 1990s. This fundamentally changes the dynamics and the politics of U.S. trade policy toward China.

### Chinese Justifications for Innovation Mercantilism

Chinese leaders are aware that China's mercantilist policies are being scrutinized by policymakers in other nations, particularly the United States. And they have developed highly sophisticated justifications for them based on careful analysis of U.S. economic policies, practices and vulnerabilities. Moreover, these justifications are often repeated whole cloth by Western defenders of Chinese economic policy. They include:

- China may engage in some mercantilist practices but so does the United States.
- China is doing nothing different than America did when it was at China's stage of development.
- China needs the jobs.
- China needs to run trade surpluses to maintain adequate foreign currency reserves.
- China would not run a trade deficit with the United States if the United States ended its export controls on high-tech products.
- Indigenous innovation is key to raising standard of living.
- Indigenous innovation is needed to reduce dependency on exports.
- Indigenous innovation is needed to deal with high labor costs.
- Indigenous innovation is needed to deal with future demographic challenges.
- Indigenous innovation is needed to address environmental challenges, including global warming.
- Indigenous innovation is needed to deal with social imbalances.
- Indigenous innovation is needed because China receives such low returns on its foreign investments.
- Don't blame China, it is poor and dependent.
- Intellectual property is a form of Western imperialism.
- Give China time: it is still learning to be a market-oriented economy.
- China can help the U.S. economy by investing its massive current account surpluses in the United States.
- United States' weak economy is its own fault, not China's.
- China isn't mercantilist.
- If the United States pressures China, the United States will become protectionist.
- The United States has no right to interfere in internal Chinese matters.

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*This strategy of promoting strategic emerging industries, the centerpiece of Chinese economic policy, at best will generate the equivalent of 14 months of Chinese economic growth.*

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This report analyzes the logic and factual basis for each of these justifications and asserts that none of them withstand close scrutiny. These claims are no more than rhetorical flourishes employed by Chinese officials to distract and throw off balance their opponents. As such, they should not be taken seriously.

The claim that China needs to practice innovation mercantilism to get rich, is particularly faulty. The evidence shows that the lion's share of productivity growth in most nations—and especially large- and medium-sized ones—comes not from expanding higher productivity industries, as China seeks to do, but from boosting the productivity of all firms and organizations, even low-productivity ones. Consider that China set a goal for the value-added of “strategic” emerging industries to reach 15 percent of overall GDP by 2020. This strategy of promoting strategic emerging industries, the centerpiece of China's economic policy, at best will generate the equivalent of 14 months of Chinese growth. In other words, China does not need indigenous innovation to raise living standards.

### **Why America Should Care About Chinese Mercantilism**

It's not as if American experts and policymakers are not aware of what China is doing, particularly as it shifts to indigenous innovation. But there is considerable disagreement both over whether Chinese policy is mercantilist and whether it represents a threat to the U.S. economy. Unfortunately however, the debate about Chinese economic and innovation policy mostly gets it wrong.

On one side are the analysts who look at China's heavy-handed statist practices, its lack of respect for intellectual property, and its massive subsidies of particular technologies and argue that there is no way for this model to be successful, and therefore America does not need to worry. In fact, it is increasingly in vogue to argue that “China is about to fail.” The advice? Just be patient. No need to do anything. Proponents of this view believe as an article of faith that the Washington Consensus is the only real playbook for economic prosperity. Any nation misguided enough to follow an alternative model, especially one as distorted as the Beijing consensus, must by definition fail. Moreover, if the Chinese government is misguided enough to subsidize its exports, American consumers are the better off for it.

But this school of thought ignores the fact that the Beijing consensus model has shown success; an economy growing at more than 10 percent per year for a decade is not failure. And even if China's policies will mean its economic stagnation in the long term, they certainly inflict lasting damage to the U.S. and other countries, both in the short term and the long term. Moreover, the standard for judging the threat from Chinese mercantilism is not whether China will succeed in dominating the industries America is good at, but rather whether Chinese mercantilist policies per se will harm the U.S. economy. On that basis, there should be no doubt.

The other prevailing view is the polar opposite. Rather than see the Beijing consensus as a flawed model that can only lead to failure, including failed innovation, devotees see an industrial and technology leviathan, eating America's technology lunch through superior implementation of world-class technology policies. They would like the Beijing consensus

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to replace the Washington consensus. And when pressed about whether China is using mercantilist means to win, China devotees protest vigorously. They insist that our economic problems are all our own making, and call for a stop to all the “China bashing.” For these China defenders, China bashers include anyone who argues that Chinese intellectual property theft, forced technology transfer as a condition of market access, currency manipulation, government procurement bias in favor of Chinese firms, standards manipulation, and a host of other mercantilist practices are rampant and hurting the U.S. economy. To be sure, China has “good” innovation policies like R&D support and R&D tax incentives. But these are supplemented by an array of unfair, mercantilist policies.

### What Should America, Europe and Other Market-Oriented Nations Do?

If the United States is to effectively address this central challenge, it’s critical that policymakers and experts have an accurate view of Chinese economic policy and China-U.S. trade. Unfortunately the two prevailing views on these topics are misguided. The “free trade” view holds that efforts to press China to end its mercantilism will only backfire, and limit what is largely a mutually beneficial trading relationship. For this camp virtually all trade is win-win, even when it is lopsided (mercantilist on one side, free trade on the other).

The “protectionist” view in contrast, holds that trade with China is fundamentally bad for American economic interests. There is no way, the view goes, that American workers can compete with Chinese workers who are paid less than 10 percent of American wages. Better we impose protective tariffs, “Buy American” provisions, and other protectionist measures and build our own autarkic economy.

Both views miss the mark. Free traders are right that it is in the economic interests of the United States for China to be an integral part of the global trading system. But they are wrong in thinking that these benefits can accrue if China’s policies undermine that trading system and China continues its strategy of absolute advantage implemented through mercantilist policies. Until China renounces its mercantilist strategy and the policies supporting it, the U.S. economy, particularly its industrial and technology base, will be hurt, more than helped, by trade with China.

“Protectionists” are right in that it is important to ramp up the pressure on China to get it to start playing by the rules. But the notion that America can’t be competitive against China, even if the latter plays by the rules, is wrong, as is the notion that global integration with China can’t be in America’s and the world’s interests. America doesn’t need to close its borders to be a vibrant competitor. It must, however, require that other nations, especially large ones, like China, play by the rules.

Yet there is no evidence that China intends to voluntarily abandon its innovation mercantilism. Despite ongoing efforts by successive U.S. administrations to engage the Chinese in dialogue, there’s little evidence that this process is doing anything more than helping to manage particular issues that come up. In cold-war terms, at best it is containing, not rolling back, Chinese mercantilism. It’s time to realize that China does what it does not because its policymakers don’t understand the merits of the American

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*China does what it does not because its policymakers don’t understand the merits of the American system and the Washington consensus. They fully understand the arguments embedded in the Washington consensus. They just reject them in favor of the Beijing consensus.*

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system and the Washington consensus. They fully understand the arguments embedded in the Washington consensus. They just reject them in favor of the Beijing consensus.

As a result, it is time that the United States and the market-based global trading community at large take stronger action to press China to join the community of trading nations and curtail its mercantilist policies. The United States can and should take a number of specific steps unilaterally, but it should also press its like-minded trading partners to take steps on a bilateral and multilateral base, including through the WTO.

But the single most important steps are to recognize the severity of the problem and then commit to real, sustained and vigorous action to address it. Until Chinese innovation mercantilism is seen as the serious threat to U.S. economic prosperity that it is, U.S. responses will not be as strong as they should be, and easily trumped by other concerns, especially foreign policy ones.

Once policymakers take the threat seriously, the next step is to take serious action. It's not the purpose of this report to lay out a comprehensive set of action steps, although many are listed. Rather, trade and foreign policy experts both inside and outside the U.S. government need to make a serious effort to explore and identify all possible avenues of action to reduce Chinese mercantilism.

Another immediate step is to take stronger action under existing authorities. This will require expanding the resources of the United States Trade Representative's Office as President Obama's FY2013 budget does. Given the scope of the challenge of fighting global (and especially Chinese) mercantilism, USTR is significantly underfunded. Any increase in the USTR budget should be tied to a strategic reprioritization toward enforcement.

Moreover, USTR too often engages in fighting the last wars—the tariff war and the war to sign trade agreements. It's not set up, either institutionally or philosophically, to fight the current war—the war against rampant innovation mercantilism fueled by a wide array of non-tariff barriers. To help address this, Congress should authorize and appropriate \$5 million to create an Office of Globalization Strategy within USTR, run by a Deputy for Globalization Strategy. Similar to the State Department's Office of Policy Planning, the office would be charged with systems thinking about the design of U.S. trade policy in the context of globalization to ensure renewed U.S. competitiveness.

USTR also needs to become more assertive in bringing enforcement cases against China. Companies are often reluctant to initiate complaints because they know that they will face retribution from the Chinese government. The U.S. government should address this conundrum by making it national policy for USTR to bring cases whenever U.S. interests are being hurt, even if U.S. companies don't want them to proceed.

Perhaps the most significant challenge facing the United States in pressing China to reform is that too many U.S. officials believe that they have few arrows in the quiver to use in forcing China to change. They can harangue Chinese leaders at G-20 summits or attempt to persuade them at S&ED meetings, and take the occasional WTO action. But by and

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large the view is that America is largely impotent to get China to change unless China sees change in its own interest. The best we can do, the thinking goes, is hope that China will change on its own before the damage to us is too great.

This fundamentally passive stance must be revised because the status quo situation is not tenable. It's incumbent upon the U.S. foreign trade establishment to thoroughly analyze all the current legal means by which we can pressure China to change and to take vigorous action based on those.

But while necessary, this is not sufficient, for much of what China does skirts international law. As a result, U.S. policymakers need to do two things. The first is to identify areas where stronger legal tools are needed and press for their implementation, either domestically or in global agreements like the WTO. For fundamentally the WTO system is designed around "trade" agreements relating mostly to imports and exports and issues like tariffs. Thus, it addresses issues like export restraints and export quotas. But more systemic distortions, such as government-run production cartels or the use of regulation and standards to discriminate against foreign firms is not really addressed. The second is to band together with other like-minded nations to use the power of exclusion and pressure.

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The most important question for the United States is what its overall strategic goal should be vis-à-vis strategic trade engagement with China. To date, that engagement has largely been what can be described as "whack a mole." The United States expends resources to identify, respond to, and combat particular instances of Chinese mercantilism. Even if it wins such battles, all too often the damage has already been done. The whack-a-mole strategy ultimately will be unsuccessful going forward because the Chinese government has shown that it can erect new mercantilist policies faster than the United States can get it to remove old ones. As a result, a new strategy needs to be grounded in a results-oriented trade regime. America and the broader community of free-trading nations, should hold China to specific goals. One is the significant reduction of its global trade surplus. China also needs to be held accountable for specific, quantifiable commitments to reduce levels of intellectual property piracy, use of global rather than domestic technology standards, and abandoning requirements for joint ventures and forced tech transfer, among other steps toward fair trade.

While the United States needs to step up its unilateral actions against Chinese innovation mercantilism, to be fully effective it will need to enlist the support of other free-trade nations. Accordingly, the United States should work with the Europeans, Canadians, Australians, Japanese and whoever else will come aboard to lay out a renewed vision for globalization grounded in the perspective that markets should drive global trade and investment, that countries should not seek to accrue sustained trade surpluses, that currency prices should not be manipulated for competitive advantage, and that fair competition forces countries to ratchet up their game by putting in place constructive innovation policies that leave all countries better off.

This new alliance of free-trading nations needs to get progressively tougher on China until it significantly scales back its mercantilist policies. In addition, it should create a new free trade zone, involving only those countries genuinely committed to adhering to the

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principles and reality of open, free, and fair trade. Toward that end the United States should also work to establish a Trans-Atlantic Partnership (TAP): a new trade agreement with Europe and perhaps all the Commonwealth nations.

The World Trade Organization must also better understand that what has been transpiring is not occasional and random infractions of certain trade provisions by a wide variety of countries that need to be handled on a case-by-case basis. WTO officials need to realize that many of its members, particularly China, do not accept the principles the WTO stands for and as such constitute a threat to global integration. The WTO must develop an enforceable regime that addresses the many non-tariff mercantilist actions nations take. One place to start would be to institute enforceable actions with regard to rules for joint-venture and technology-transfer requirements and to allow the interpretation of requirements to be based on real conditions on the ground not some provisions in a government legal code. A second area of opportunity is in how to address state-owned enterprises (SOEs). The idea that opaque, heavily subsidized, and favored SOEs are competing with firms that must raise their own capital in the marketplace makes a mockery of the idea of fair and welfare-enhancing competition. A third area is standards. Standards manipulation for competitive advantage should be more easily WTO-actionable.

It's not too late for the United States and allies to contain and roll back Chinese innovation mercantilism. But action will be resisted not only by Beijing but also by Washington. Many in the U.S. foreign policy establishment refuse to recognize the real nature of the threat, preferring to see themselves first as members of a global community of elites, rather than as American patriots. As such, they will offer a number of rationalizations for the status quo.

Perhaps the most pernicious concept limiting tougher action against Chinese innovation mercantilism is that as long as the United States is not mercantilist it still benefits from trade with China. But this is not the right way to frame the issue. The right way is to ask whether reduced Chinese mercantilism would have non-trivial beneficial impacts on the U.S. economy. Only the most zealous neoclassical ideologues and "Friends of China" would assert that it would not.

Even if some will admit that Chinese economic mercantilism hurts the U.S. economy, many in the trade establishment ascribe America's economic problems to America. According to this view, rather than focus on China's unfair practices, we should instead get our own house in order. Of course, as ITIF has long argued, the United States needs to do more to be more globally competitive.<sup>6</sup> But unless China reduces its innovation mercantilism, these actions will fall far short of producing the kind of high-growth economy America needs.

Finally, many in the Washington trade and foreign policy establishment will assert that any efforts to roll back Chinese mercantilism will lead to a destructive trade war. But the trade war is already more than a decade old, and China has fired virtually all of the shots and done almost all of the damage. Working to roll back Chinese mercantilism is not protectionism; it is a defense of the global, free market economy.

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We have seen this movie before. In 1989, Shintaro Ishihara, then Japan's Minister of Transport and Akio Morita, Sony co-founder and Chairman, wrote an influential essay titled "The Japan That Can Say No."<sup>7</sup> It criticized the American economic model and advocated that Japan start standing up to America, including on economic policy issues. China is rapidly approaching the same position where it will soon be "The China That Can Say No" and not have to negotiate with the United States over trade issues.

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But at least for the foreseeable future China needs America more than it need China. It needs American markets and technology. It is therefore critical that the United States and its free-trade allies take the needed steps now to "contain and roll back" Chinese innovation mercantilism, before it is too late. For each year we wait means losing some of the leverage we have. At some point within the next decade, the leverage of the free trading, market-oriented nations will be gone with the very real possibility of the Beijing consensus, rather than the Washington or Helsinki consensus holding sway, not just in China, but in much of the developing world. That would be bad for America, bad the world, and ultimately bad for mercantilist nations. It's time to say, "Enough is enough!"

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"We must improve our capabilities for original innovation, integrated innovation and re-innovation through digesting introduced technologies to transform to an innovation-driven economy and society."

(Chinese President Hu Jintao, December, 2011)<sup>8</sup>

## INTRODUCTION

The intellectual foundation of the global trading system stems from the work of classical economist David Ricardo (1772-1823). His theory of comparative advantage, which holds that the market determines comparative advantage and that more trade is always welfare-maximizing, has long been the north star guide for U.S. international trade policy.<sup>9</sup>

Ricardian theory assumes that comparative advantage is static (e.g., some countries are good at wine, others at textiles). But "new trade theory" holds that nations can develop competitive advantage (e.g., become good at textiles and not just wine) through economic policies. This theory emerged because it became clear that some nations, particularly Japan and the fast-growing Asian Tigers, employed conscious industrial (and often unfair mercantilist) policies to create competitive advantage in key industries.

The theory (if not always the practice) of competitive advantage is also supportive of trade and globalization, for it, like Ricardian theory, is based on the principle that economies should export products and services for which they have (or want to have) competitive advantage and use the earnings to import that which they need and cannot competitively produce. Over the last sixty years this model has generally worked, and while there have been tensions between nations over the use of unfair trade practices, these tensions have either been managed through existing global trading institutions or were not so great as to cause wide-scale distortions and dislocations.

But to paraphrase Reinhart and Rogoff, (authors of the influential book *This Time Is Different*) it really is different this time. For China is not only practicing mercantilism on an unprecedented scale; it is pursuing it to gain absolute advantage. In other words, China's strategy for globalization is to win in almost all of industries through its new goal of indigenous innovation. As hard as it may be for adherents of Western neoclassical economics to grasp (for they assume that all nations are Ricardians), China doesn't want to make some things and buy others; they want to make virtually everything, especially advanced technology products and services. As such Chinese economic strategy consists of two main objectives: 1) develop and support all industries that can expand exports, especially higher value-added ones; and 2) develop strategies to reduce, if not eliminate imports, especially non-raw materials imports. China uses many means to achieve these goals, including legitimate policies like funding science and having a competitive corporate tax code. But they also have enacted a vast array of unfair, mercantilist practices. This model, more than any other, explains Chinese economic policy. As economist columnist Robert Samuelson stated, "The trouble is that China has never genuinely accepted the basic rules governing the world economy."<sup>10</sup>

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*Running an integrated global trading system that maximizes global welfare is impossible when the world's second-largest economy undermines its very premise.*

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Because so many people now just take it for granted that China will engage in these practices it's easy to overlook just how far out of step China is from the WTO consensus. But China's approach represents an extreme form of mercantilism and as such is fundamentally at odds with the principles of an open and rules-based international trading system that China committed to when it elected to join the World Trade Organization (WTO) in 2001. Countries that join the WTO make a commitment to joining a trading system, not an exporting system. If countries wish to pursue mercantilist policies, they might be free to do so, but not if they are members of the WTO, since mercantilism violates the spirit of the WTO.

Even if China usually sticks to, but just barely, the substandard rules governing global trade and economic activity, while doing other things that are more trade restrictive than necessary, its goal of absolute advantage runs counter to the effective functioning of the global trading system, which is grounded in the notion of competitive advantage: nations finding what they are good at or can be good at and exporting products and services in these areas to pay for the imports of goods and services they are not as good at producing. Running an integrated global trading system that maximizes global welfare is impossible when the world's second-largest economy undermines its very premise.

To be clear, China has every right to focus on boosting Chinese per-capita income. But this does not justify beggar-thy-neighbor mercantilist policies. Moreover, China's system does not, in fact, maximize China's economic welfare; certainly not Chinese consumer welfare. If China's economy were based on the neoclassical economics view that the goal is to maximize consumer welfare, China would seek to import much more, which would immediately raise Chinese incomes by as much as 17 percent.<sup>11</sup> Rather, China's economic policy is based on maximizing producer welfare, even if that policy imposes significant costs on Chinese consumers, especially in the short run. And it's a particular kind of producer welfare where the owners of many of the factors of production is in fact the Chinese Communist Party. As such, the focus on producer welfare is tied not just to a particular theory of economic growth but to self-interest of the Chinese government and officials in it.

This report argues that there are two predominant views in America of China-U.S. trade and that both miss this point to generate fundamentally mistaken policy conclusions. The "free trade" view holds that we should support the current system with China, as problematic as it might be, and that vigorous efforts to press China to end its mercantilism will only backfire, leading to a destructive "trade war" that would dramatically limit what is largely a mutually beneficial trading relationship with China.<sup>12</sup> For this camp virtually all trade is win-win, even when it is lopsided (mercantilist on one side, free trade on the other).

But because China is so large and because its distortive policies are so extensive, these policies have done significant damage to the United States' and global economy. These impacts should not be minimized. The massive subsidies to keep production cheap, including currency manipulation, artificially reduces the cost of Chinese labor and moves the world production system more towards labor and away from capital, reducing global

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productivity. The theft of intellectual property and forced technology transfer reduces the revenues going to innovators making it more difficult for them to reinvest in R&D and produce innovation for the global economy. The manipulation of standards and other limitations on imports balkanizes global markets, keeping them smaller than they otherwise would be, thereby raising global production costs. The policies to limit Chinese imports reduce global market integration.

In contrast, the “protectionist” view holds that trade with China is fundamentally bad for the United States, and would be even if China were to reform and abide by the spirit of comparative advantage. There is no way, the view goes, that American workers can compete with 815 million Chinese workers who are paid less than 10 percent of American wages.<sup>13</sup> Better we impose protective tariffs, “Buy American” provisions, and other protectionist measures to build our own autarkic economy.<sup>14</sup>

Neither view is accurate and both are counterproductive to rational and constructive debate. Free traders are right that it is in the economic interests of the United States and the world for China to be an integral part of the global trading system. But they are wrong in thinking that these benefits can accrue if China continues its strategy of absolute advantage implemented through mercantilist policies. Until China moves away from this strategy and the policies supporting it, the U.S. economy, particularly its industrial and technology base, will be hurt, more than helped, by trade with China. Moreover, making it clear to China that its continued mercantilism will come with real costs, rather than starting a trade war, may in fact strengthen the position of those individuals within their government who are supportive of a goal of comparative advantage achieved through a more market-oriented path.

“Protectionists” are right in that it is important press China to play by the rules. But the notion that America can’t be competitive against China, even if the latter dramatically reduces its mercantilist policies is wrong. America can win and doesn’t need to resort to shutting itself off from globalization to be a vibrant competitor. It just needs a fair and rules-based playing field (supplemented with robust domestic innovation and competitiveness policies).

It is important to note that even if China were to embrace the notion of competitive advantage and dramatically reduce its mercantilist policies, some U.S. workers would still lose their jobs to China trade but others would gain jobs.<sup>15</sup> Such disruptions are part and parcel of globalization and the price nations pay for the greater benefits of global integration. But defenders of the trade status quo fail to appreciate that there’s a fundamental difference between dislocation produced by economic restructuring by nations pursuing comparative/competitive advantage and dislocation produced by absolute loss of competitive advantage via foreign mercantilism. The former hurts some workers, companies and communities but generates economic growth. The latter hurts many more individuals, companies and communities and generates economy-wide loss.

If China renounced its autarkic strategy and embraced a competitive advantage strategy and if the United States adopted a national competitiveness and innovation policy America would still lose jobs from trade but it would gain just as many, if not more, jobs from trade

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*China has every right to focus on boosting Chinese per-capita income. But this does not justify beggar-thy-neighbor mercantilist policies.*

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in higher value-added, higher wage industries, powering faster economic growth. But if Chinese policies continue to be based on absolute advantage, the results will be more of the same: the absolute loss of U.S. industrial and high-tech output and the jobs and GDP growth that go with it.<sup>16</sup> The logical evolution of this path is something akin to what is happening to Great Britain: an economy that was once great now suffering from a hollowed-out traded sector and experiencing great difficulty in creating robust numbers of good jobs and rising living standards.

Washington Consensus	Beijing Consensus	Helsinki Consensus
We're #1 so we don't really have to try hard.	We're inferior and are justified doing almost anything, no matter how unfair, to overcome this.	We have some advantages but will lose them if we don't work hard to become more globally competitive.
Consumer welfare is what matters	Producer welfare is what matters.	Both consumer and producer welfare matter and have to be balanced.
Government's job is to ensure that markets are competitive and that entry, exit, and prices are not distorted.	Government's job is to control the market so that the nation is competitive and so that entry, exit, and prices are distorted.	Markets generally work, but government needs to play an enabling role to drive innovation and competitiveness.
Globalization is an unalloyed good for us, even if other nations engage in innovation mercantilism.	We will pursue mercantilist policies in our own interest regardless of what other nations do.	Globalization is an unalloyed good for us only if other nations play by the rules and if we spur innovation at home.
Mercantilists only hurt themselves.	Mercantilists help themselves and everyone is or should be mercantilist.	Mercantilists can hurt themselves but also us.
America's role in the global economy is to be a shining "city on the hill" which, by force of example, shows misguided nations why mercantilism is wrong.	China's role is to look out for China.	A country's role is to be a tough competitor that looks out for itself but in a way that doesn't unfairly hurt the global economy and that works to enforce rules of fairly growing the global innovation economy.
Government can do little to spur innovation; it's "manna from heaven."	Government plays the central role in driving innovation.	The private sector leads in innovation, but will underperform without smart government innovation policies.

**Table 1: The "Washington," "Beijing" and "Helsinki" Consensus' on Trade and Competitiveness**

Chinese officials are clearly aware of the damage their mercantilist policies have had on the American economy (and other economies), but they portray China as a partner in the global economy, albeit one that as a poor developing nation should be allowed to cut corners that more developed nations should not.<sup>17</sup> They like to paint the United States as a

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*Making it clear to China that their continued mercantilism will come with real costs may strengthen Chinese reformers' position.*

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key trading partner. In fact, they don't really see the United States as a trading partner. Rather America is an "importing partner" (with America doing most of the importing) and a "tech-transfer partner" (with virtually all of the technology flowing from the United States to China). In other words, America's role is to serve as an import platform for producers in China (now mostly multinationals, but increasingly domestic Chinese firms) and as a source of technology to help Chinese firms move up the technology and value-added scale so that they can displace U.S. multinationals on the world stage.

And this aggressive approach towards the implementation of China's mercantilist policies suggests that there is a fundamental ideological difference between how the Chinese state sees its role in bringing about state capitalism and the traditional western model of capitalism supported by global organizations such as the WTO.

But the even larger threat is that the Beijing consensus will replace the Washington consensus as the guiding star of other nations around the globe seeking to get rich. We already see this in Brazil and India which are looking to emulate China in certain respects by ramping up mercantilism.<sup>18</sup> If this happens, it will be extremely difficult to maintain a global trading system that operates along the lines most economists originally envisioned.

What we need is neither the Washington consensus—which is flawed in the conceptual limitations it places on legitimate government roles to spur innovation and competitiveness—nor the Beijing consensus, which is fundamentally a threat to globalization, but rather what might be termed a "Helsinki consensus." In other words, nations like Finland are fundamentally committed to a vision of global integration and free trade, but at the same time recognize that "good", non-mercantilist innovation policies (e.g., funding for research and technology transfer, support for STEM education, R&D tax incentives, etc.) are critical to enable them to effectively compete in global markets. The World Bank, IMF, and other multilateral organizations need to be advocating the Helsinki consensus around the world so that nations are not forced into an unproductive choice between the Washington consensus and the Beijing consensus. If their choice is so limited, too many will default to the latter, especially as they look at the respective economic performances of the United States and China.

## **THE TRANSITION FROM "CHINA AS FDI ATTRACTOR" TO "CHINA INC."**

In the 1980's U.S. multinationals were largely united in their efforts to enlist the U.S. government in their fight against Japan's mercantilist policies. For Japan was "Japan Inc."—a business-government partnership designed to favor Japanese companies at the expense of foreign ones. This included limiting access of foreign firms to the Japanese market and encouraging Japanese firms to form cartels to price under cost in foreign markets. Realizing that without strong U.S. government action they would lose global market share, U.S. companies pressed the U.S. government to actively fight against Japanese mercantilism (and to support stronger U.S. domestic policies to spur competitiveness). The government did so through the Reagan and Bush administrations, supported by Congress, in large part because U.S. companies' interests aligned closely with the interests of U.S. workers and consumers.

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However, by the mid-1990s and through the first half of the 2000s the situation looked quite different. Japan had receded as a perceived threat, in part due to the partial success of U.S. government trade and competitiveness policies, including in areas like autos and semiconductors, and also because of the fallout from the bursting of Japan's economic bubble. Now China has become the new focus of U.S. multinationals, especially after China's accession to the WTO in 2000. However, the Chinese development model was quite different than Japan's. While Japan was closed to inward foreign domestic investment (FDI), China was not only open to it; it actively encouraged FDI through a vast array of incentives for foreign firms to set up establishments there. While the consequences might not have always been good for the U.S. economy, especially for production workers in traded sectors, U.S. multinational corporations (MNCs) benefited through access to a global low-cost production platform and Americans in their role as consumers benefited from lower cost goods. And while China occasionally engaged in policies that brought complaints from U.S. industry, by and large U.S. industry was satisfied with the relationship in part because the potential market opportunities were so large. In short, while both China and Japan represented a threat to U.S. workers, only Japan represented a threat to U.S. multinationals.

In 2006, China made the strategic decision to shift to a "China Inc." development model focused on helping Chinese firms, often at the expense of foreign firms, even those with Chinese facilities. Chinese Communist Party leaders decided that being an economy based on attracting commodity-based production facilities from MNCs was no longer the goal, as it had been since the early 1980s when Deng Xiaoping made the strategic decision to open up China to international investment. The path to prosperity and autonomy was now to be one of "indigenous innovation" with Chinese-owned firms the focus.

The seminal document articulating this shift was the *"Guidelines for the Implementation of the National Medium- and Long-term Program for Science and Technology Development (2006-2020)."*<sup>19</sup> The so-called "MLP" intended to "create an environment for encouraging making innovation independently, promote enterprises to become the main body of making technological innovation and strive to build an innovative-type country."<sup>20</sup> This was much more than a strategy to target some key areas where China had some preexisting capabilities. Rather the MLP "must be made a national strategy that is implemented in all sectors, industries, and regions so as to drastically enhance the nation's competitiveness."<sup>21</sup> And when it said all it meant all, or at least virtually all. It went on to state, "There is a need to strengthen the position of agriculture as the foundation of the economy, raise the manufacturing sector's core competitiveness, develop strategic emerging sectors, quicken the pace of service trade development, and bring about the transformation of the economic growth that relies on and is driven by coordinated development of the primary, secondary, and tertiary industries."<sup>22</sup> And it should be noted, this goal of enhancing competitiveness of all sectors was made when China was running unprecedented global trade surpluses.<sup>23</sup>

What sectors did the MLP call out? A better question is what sectors were not a focus, as the MLP called on China to "master core technologies" in virtually every area Chinese state planners could imagine. Indeed, the MLP targeted mastery in all 402 technologies, but this

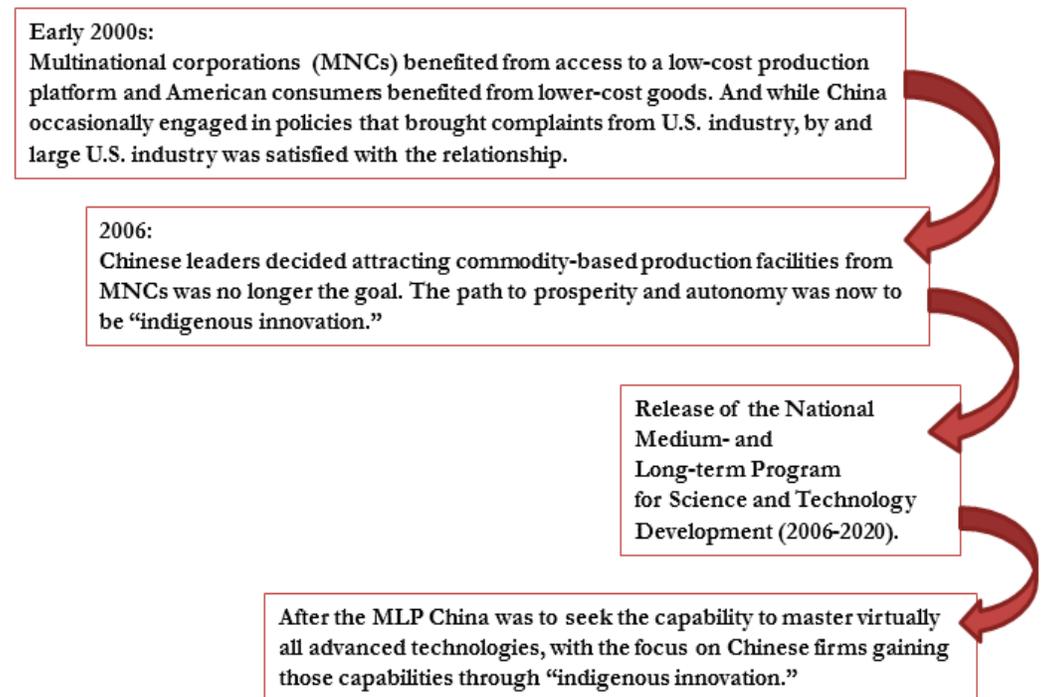
represented an important aspirational goal. (See Appendix A for list of all 402 technologies).

The MLP represented a major shift in direction for Chinese economic policy, calling upon China to seek the capability, through Chinese-owned firms, to master a much wider range of advanced industrial technologies. As the MLP states:

To ensure the implementation of the missions defined in the Outline, efforts should be made to formulate more effective policies and measures, in addition to addressing system and mechanism related issues. All policies and measures shall be made such that they are conducive to enhancing indigenous innovation capability.<sup>24</sup>

To be sure, China has not sought But the MLP was not just about China gaining widespread high-tech industrial capabilities, it was about Chinese-owned (especially state-owned) firms gaining those capabilities. In other words, the MLP shifted China’s focus from FDI attraction to what has become known as “indigenous innovation.” While Chinese officials will portray “indigenous innovation” as simply meaning “innovation,” in fact it means innovation based on helping Chinese-owned firms, not foreign-owned firms. As China scholar Deiter Ernst notes “There is no doubt that the MLP contains techno-nationalist notions of self-reliance.”<sup>25</sup>

*In 2006, China made the strategic decision to shift to a “China Inc.” development model focused on helping Chinese firms, often at the expense of foreign firms, even those with Chinese facilities.*



**Figure 1: The Progression of “China Inc.” from the Early 2000s to Today’s MLP Model**

Lest one think that this goal was unique to the MLP, China’s 11<sup>th</sup> five-year plan refined these industries and targeted sixteen “megaprojects.” As James McGregor writes, “these are vehicles for an import substitution action plan aimed at creating Chinese indigenous

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innovations through ‘co-innovation’ and ‘re-innovation’ of foreign technologies.”<sup>26</sup> Three of the sixteen are deemed classified, but the other thirteen were:

- Core electronic components, high-end general use chips and basic software
- Large-scale integrated circuit manufacturing equipment and techniques
- New-generation broadband wireless mobile communication networks
- Advanced numeric-controlled machinery and basic manufacturing technology
- Large-scale oil and gas exploration
- Large advanced nuclear reactors
- Water pollution control and treatment
- Breeding new varieties of genetically modified organisms
- Pharmaceutical innovation and development
- Control and treatment of AIDS, hepatitis, and other major diseases
- Large aircraft, and
- High-definition earth observation system<sup>27</sup>

China’s latest five-year plan (the 12<sup>th</sup>) narrows this focus, but re-commits to these goals stating, “It is necessary to comprehensively implement the state’s long and mid-term programs for science and technology.” In 2011, the Chinese government committed to “place the strengthening of indigenous innovative capability at the core of economic restructuring, growth model change, and national competitiveness enhancement ...Indigenous innovation refers to enhancing original innovation, integrated innovation, and re-innovation based on assimilation and absorption of imported technology, in order to improve our national innovation capability.”<sup>28</sup> The proposal for the plan goes on to stress:

We should persist in the principle of independent innovation, making key strides, of supporting development, and of providing guidance in the future, increase commonality and capability on core technology breakthrough, and promote the transformation of sci-tech results into real productive force. There is a need to accelerate promoting the state’s special major sci-tech projects and implement new knowledge-innovation and technology-innovation projects in an in-depth manner. We should closely integrate sci-tech progress with the optimization and upgrading of industrial structure and with the improvement of people’s livelihood, enhance the capability of making original innovation, of integrating, introducing, digesting innovation, and score new breakthroughs in such areas as modern agriculture, equipment manufacturing, ecology, environmental protection, energy, resources, information network, new materials, security, and health, overcome a number of key core technologies such as core electronic components, very large scale integrated circuit, system software, new varieties of genetically modified foods, making of new drugs. We should enhance basic frontier technology research, and strive to occupy a high ground in future sci-tech competition in life sciences, marine, space, global science, and nanotechnology.

We shall develop advanced equipment manufacturing sector, adjust and optimize raw materials industry, transform and upgrade consumption goods industry, and help the manufacturing sector to become big and strong. There is a need to rely on the state’s key projects to develop major technological and equipment policies, raise the research and system integration level of basic craft, basic materials, and basic components. We

will support enterprises to engage in technological transformation and increase their new product development capabilities and the ability to create name brand products.

We will scientifically judge changes in future market demand and technological development trends, enhance policy support and planning guidance, strengthen research and development of core and key technologies, seek breakthroughs in key areas, positively and in an orderly way develop new generation of industries including information technology, energy conservation and environment protection, new energies, biology, high-level equipment manufacturing, new materials, new energies, and automobiles. We will accelerate forming pioneering and pillar industries and earnestly raise industries' core competitiveness and economic efficiency. We will give play to the state's leading and supporting role for special sci-tech projects, implement industrial innovation development projects, increase taxation and financial policy support, and help high technology industry to become big and strong.<sup>29</sup>

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*For the United States to match China's financial commitment to its strategic emerging industries on a per-GDP basis, it would have to pass an American Recovery and Reinvestment Act every year for the next five years and dedicate nearly 100 percent of the funds to industry.*

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The plan identifies seven priority strategic emerging industries (SEIs), aiming to increase their contribution to GDP from their then current 2 percent level (2008) to 8 percent by 2015 and 15 percent by 2020. These areas are: 1) energy saving and environmental protection; 2) new generation of information technology; 3) biotechnology; 4) high-end equipment manufacturing; 5) "new energy;" 6) new materials; and 7) new energy vehicles. China's State Council first identified these industries in its "Decision on Accelerating the Fostering and Development of New Strategic Industries" announced in 2010. To reach this goal China will provide SEIs with preferential policies, incentives, and funds. In fact, the central government recently announced that it would invest \$1.5 trillion to develop these "strategic sectors" over the next five years.<sup>30</sup> For United States to match China's commitment to its SEIs is a per-GDP basis, it would have to pass an American Recovery and Reinvestment Act every year for the next five years and dedicate close to 100 percent of the funds to industry. Most recently the State Council released a report detailing China's ambitions to be the leading nation with regard to space exploration, noting "The Chinese government makes the space industry an important part of the nation's overall development strategy."<sup>31</sup>

And unlike in the United States, where plans and strategies often find a long and solitary life on the shelves of government offices, Chinese officials use these plans and strategies to guide implementation. One way China sought to implement the new indigenous innovation strategy was through government procurement. In 2009, the central government adopted regulations requiring the creation of catalogues of innovative products that the central government would rely on when making government procurement decisions. To qualify for inclusion in these catalogues the product not only had to be made in China, the intellectual property on which it was based had to be Chinese or transferred to China. Applicants were asked about whether their shareholders were foreign or domestic, presumably to ensure that Chinese-owned firms would be the main beneficiaries. In addition, the central government ordered provincial governments to establish their own indigenous innovation product catalogues. The new policy was to make procurement open to foreign-owned companies in China as long as the innovation occurred on Chinese soil and they moved the R&D to China. Chinese agencies took steps to officially rescind the

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policy in July 2011 in response to intense foreign pressure. However when provincial and local governments did not all comply, China's State Council issued a directive in late November 2011, which was announced at the 2011 U.S.-China Joint Commission on Commerce and Trade, that officially ended the policy nation-wide on December 1, 2011.<sup>32</sup> While government departments were told to remove regulatory documents related to indigenous innovation, its intent likely remains latent with many central and provincial government purchasing managers, who are likely to continue to tilt their purchasing to Chinese-owned companies.<sup>33</sup>

This shift to indigenous innovation can also be seen in policies toward specific industries, including aviation and autos where the Chinese government hopes to become self-sufficient through Chinese firms. COMAC, the state-owned Chinese commercial aircraft company, benefits from a wide array of mercantilist policies in order to foster the development of a narrow-body aircraft to compete with Boeing and Airbus despite the fact that the global aviation market is best served through market-based policies and not artificially produced overcapacity.<sup>34</sup> COMAC's stated goal is clear: get as much foreign aviation technology as possible while seeking to develop its own "independent intellectual property rights."<sup>35</sup> COMAC "will commit to national and international cooperation based on the 'airframe suppliers' model to share risks and benefits, and build a system of both national and international suppliers for trunk lines, and eventually establish relatively complete service and industrial chains in the commercial airplane business."<sup>36</sup> In other words, the goal is to produce all kinds of airplanes, from commuter jets to wide-body, long-haul jets and to produce all the supply chain inputs, including engines and advanced avionics.

And one key tool in this strategy is procurement. As the Congressional Research Service (CRS) states, China "fully intends to use its domestic market for aircraft where Chinese airlines will buy COMAC airplanes—even if they prove to be inferior to competing products."<sup>37</sup> COMAC hopes that this fully protected and rapidly growing domestic market will enable it to get the scale and learning economies it needs to become globally competitive. CRS concludes by stating:

The Chinese commercial aircraft industry is currently at a stage of developing domestic capabilities that require complex cooperative partnerships with foreign (chiefly European and American) suppliers. But COMAC's principles suggest an agenda that envisions a national policy of economic independence for its aircraft industry and possibly its aircraft market—a more autarkic vision that appears to differ from those of companies that are pursuing market opportunities within a free trade context in China and elsewhere."<sup>38</sup>

In other words, China not only has no intention in the future of importing airplanes and airplane parts, it actively seeks to dominate global export markets. Whether it can achieve this vision is not relevant for this argument. What is relevant is that it reflects a particular kind of economic goal—autarky—implemented through massive state intervention (e.g., coerced technology transfer, protected markets, and massive subsidies). China's National Development and Reform Commission (NDRC), the country's economic management agency, is replicating this model in the auto industry. From the mid-1980s until recently,

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*Since 2006, China has shifted more to the Japanese and Korean model of development, based on helping their domestic companies grow. As such, the conflict is now not just between American and Chinese workers; it's between American companies and Chinese companies.*

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China's strategy for the automobile industry was to give permission to a small number of foreign auto companies (e.g., Volkswagen, Nissan, GM) to build a limited number of cars in China, but only as a joint venture with an SOE, usually one controlled by a provincial government.<sup>39</sup> But to protect the "healthy development" of the Chinese auto industry, the NDRC recently removed car manufacturing from the list of industries where it encourages foreign investment. Whereas China was content to allow foreign auto firms access to the Chinese market as long as they produced there in joint ventures, now even these mercantilist policies are not enough. The new goal is to force technology transfer, co-production and explicit favoritism of Chinese-owned auto companies.<sup>40</sup> A case in point was the recent announcement that the Chinese government will not let General Motors or Ford qualify for tax incentives that Chinese residents can receive for purchasing electric cars, unless GM and Ford transfer proprietary and valuable electric vehicle technology to China.<sup>41</sup>

Despite the consistency of the 12<sup>th</sup> Five-Year Plan with the MLP, some in the United States have seized on language in the plan to argue that China is turning a corner on its mercantilist past and seeking more "balanced growth" through expanded domestic consumption. The plan certainly pays lip service to increased domestic consumption (how could it do otherwise, given the pressure on China to appear as if it is not driving its economic growth through exports. But the reality is that if China achieves even a portion of its technology goals laid out in the 12<sup>th</sup> Five-Year Plan it would see a growth, not a decline, in its trade surplus, with a big growth of exports (and reduced imports) in innovation-based, higher value-added industries. (By definition if China wants its strategic emerging industries to go from 2 percent to 15 percent of GDP, it must try to reduce imports or expand exports). Moreover, the low priority given to modernizing China's domestic service industries and boosting the productivity and energy efficiency of existing manufacturing industries reinforce this interpretation.<sup>42</sup> So do statements about trade. When the Plan states, "We need to give play to the important role of imports on macro-economic balance, and promote a basic balance in trade payments," it sounds as if the Chinese government is finally getting serious about rebalancing its economy. But the plan goes on to set a goal of expanding exports:

It is necessary to stabilize and expand foreign demands, maintain the current advantages in export competition, accelerate nurturing new advantages in competitiveness with technology, brand names, quality, and service at its core, extend the domestic value chain of processing trade, promote market diversification, greatly develop service trade, and promote the transformation and upgrading of export structure.<sup>43</sup>

In other words China not only wants to maintain current advantages in its low value-added manufacturing (including through refusal to allow the renminbi to appreciate other than a few percent a year) but also to gain new competitive advantage in products it now imports. To the extent this is a rebalancing strategy it is rebalancing between low-tech exports and high tech exports, with the latter expanding. This is reflected in a recent statement by Zhang Ji, director-general of the Ministry of Commerce's Department of Mechanical,

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Electronic and High-tech Industry: “the significance of China’s foreign trade (in advancing the economy) will be prominent, probably in the next two to three decades or even longer.”<sup>44</sup>

Since 2006, China has shifted more to the Japanese and Korean model of development, based on helping their domestic companies grow by moving up the value chain and gaining global export market share. As such, the conflict is now not just between American and Chinese workers as it had been, it’s between American companies and Chinese companies, just as it was between Japanese companies and American companies in the 1980s and 1990s. And this fundamentally changes the dynamics and the politics of U.S. trade policy toward China.

It’s also important to stress that the embrace of this new indigenous innovation strategy does not mean that it will succeed. China likely will not win in all of the industries it has targeted. But given the considerable resources it is pouring into them, it is likely it will win in some; and even in those in which it does not prevail, its mercantilist policies are likely to harm the U.S. and global economy. It’s also important to note that while China wants to win in a wide array of industries, it so far has been willing to let foreign companies win in some, especially in sectors like consumer products of the kind that a company like Proctor and Gamble makes, and certain services. This could reflect their lack of know-how in brand development or awareness of Chinese consumer skepticism with Chinese brands. Or it could be a result of their belief that innovation is about “technology” and not about “soap and toothpaste” or business models and design. But it’s also possible China will start to focus more on these industries as well.

Before discussing the nature and implications of this major change in Chinese economic strategy, it’s worth first examining Chinese policies more closely since their scope surpasses anything the Korean or Japanese governments sought to do. The Chinese government has not only learned from them, it has the added advantage that China can offer the world’s second-largest and fastest-growing market to multinational companies seeking customers. When you are a monopsony (the only single buyer) you have considerable power over suppliers. And China is a monopsony in that no company with global ambitions can afford to not be there: witnesses Google’s recent decision to recommit to China.<sup>45</sup>

## **CHINESE MERCANTILIST PRACTICES**

Former Obama Administration economic advisor Larry Summers once stated, “The laws of economics are like the laws of engineering. One set of laws works everywhere.”<sup>46</sup> It is this comforting notion that has enabled many U.S. experts to fail to take the threat from Chinese mercantilist policies seriously. For them, the Chinese must be like us—or at least working to become so especially if we teach them—and so they will eventually structure their economic policy to focus on consumer welfare generated through free markets.

But Chinese economic policy is not about maximizing short-term consumer welfare through free markets. Rather it is about maximizing long-term producer welfare and achieving autarky. To be sure, in some cases, Chinese policies are fair and legitimate, such as policies to support research universities or infrastructure. These kinds of policies help the

Chinese economy better compete in global markets that also increase net global welfare.<sup>47</sup> But China also embraces an array of mercantilist policies whose principal focus is on helping its economy in an unfair manner at the expense of the rest of the global economy.

These policies have two distinguishing features. The first is their scope and size. While virtually all national governments and many subnational governments have crafted economic development policies to boost competitive advantage (e.g., the ability to have balanced trade while enjoying favorable terms of trade), China has developed the most comprehensive set of policies of any nation, with, as described below, most of them violating the spirit of the WTO. The second feature of Chinese mercantilist policies is their focus on Chinese-owned firms, particularly state-owned firms, and on denying equitable treatment to foreign-owned firms. Most governments around the world provide economic incentives and other encouragement to any establishment within their borders, regardless of the shareholder nationality. But, as we have seen, the Chinese government increasingly rejects this strategy, and has developed policies that give preferential treatment to Chinese-owned firms. Chinese mercantilist policies can thus be divided into two groups: those designed to: 1) unfairly spur exports and reduce imports while being indifferent to the firm nationality; and 2) explicitly discriminate against foreign establishments in China.

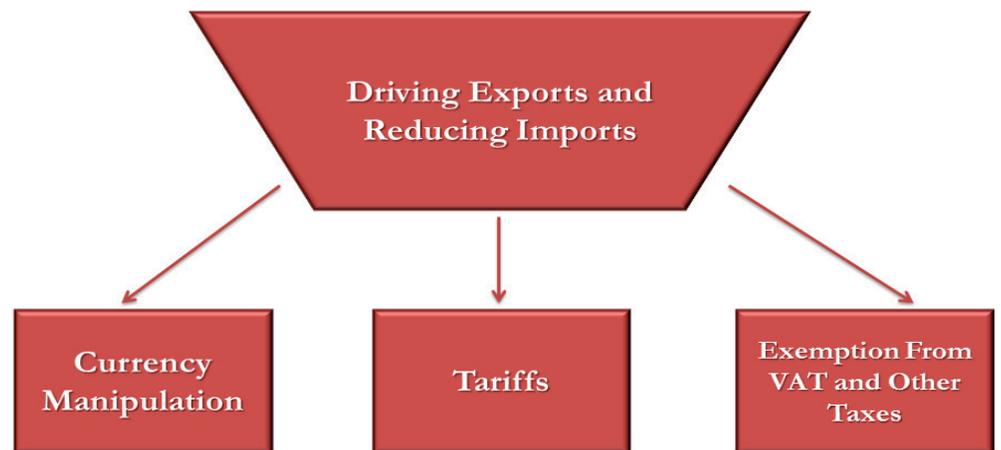


Figure 2: Chinese Mercantilist Policies Drive Exports and Reduce Imports

### Driving Exports and Reducing Imports

China engages in an array of mercantilist policies to boost its trade surplus, enabling it to accumulate \$3.2 trillion worth of foreign exchange reserves as of November 2011 and to enjoy the world's largest current account balance. (See Figure 2)<sup>48</sup> While this report identifies a number of these mercantilist policies it does not address lax environmental regulations, suppression of labor unions, and weak workplace regulations, even though those are frequently listed by critics of Chinese economic policies as giving China an unfair advantage. Environmental regulations are not included because there is little evidence to suggest that Chinese environmental regulations are any more lax than those of many other nations at their level of development, most of which are not running chronic trade surpluses. As nations develop, they generally increase the stringency of their environmental regulations. Chinese wage suppression is not included because if China allowed its currency

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to adjust to market forces, the currency would increase to offset any Chinese labor cost advantage (once productivity differences were included).

### Currency Manipulation

Perhaps the largest Chinese export subsidy (and import tariff) is their pegging of the renminbi to the dollar. While the Obama administration (like the Bush administration before it) refuses to declare China a currency manipulator, there is no doubt the country manipulates its currency to gain export advantage.

Indeed, it is almost Kafkaesque that the Treasury Department refuses to acknowledge what everyone knows to be true. Their justification is that it is difficult to determine if the currency is being manipulated.<sup>49</sup> Yet in its semi-annual report to Congress on international economic and exchange rate policies it states that China has a “heavily managed exchange rate regime.”<sup>50</sup> To paraphrase Bob Dylan, it doesn’t take a financial economist to know which way the currency is being manipulated. Pegging the RMB to the dollar is manipulation, pure and simple. As the CIA’s “*World Factbook*” states, “China’s exchange rate is determined by fiat, rather than by market forces.”<sup>51</sup> It is also clear that this is in violation of IMF rules, although the IMF refuses to take any action. As Robert Cassidy, President Clinton’s Assistant U.S. Trade Representative for Asia and China (and principal negotiator for the market access agreement that led to China’s accession to the WTO) argued in 2008, “China has adopted an export-led development strategy, the centerpiece of which is a currency that is undervalued by 20 percent to 80 percent, with the consensus leaning toward 40 percent. Thus, China’s wages in U.S. dollar terms are 40 percent cheaper than they would be if the currency were allowed to freely float. Similarly, foreign investors receive a 40 percent subsidy to develop operations in China.”<sup>52</sup>

In 2010 the Peterson Institute for International Economics concurred, noting, “The renminbi is now undervalued by about 25 percent on a trade-weighted basis and by about 40 percent against the U.S. dollar.”<sup>53</sup> While it is true that the renminbi is up about 12 percent on an inflation-adjusted basis since June 2010, it is still undervalued. China’s government strictly controls the flow of capital in and out of the country. Every day, China buys approximately \$1 billion in the currency markets, holding down the price of the renminbi and thus maintaining China’s artificially strong competitive position. China has actually doubled the scale of its currency intervention since 2005, now spending \$30 to \$40 billion a month to prevent the renminbi from rising.<sup>54</sup> China’s competitive undervaluation is a defacto subsidy to all exports and tariff on all imports and it lowers global economic welfare.<sup>55</sup>

### Tariffs

Most nations place tariffs on at least some imported products but China places tariffs on a wider range of products and at a higher rate, despite the country’s membership in the WTO. Among twenty-one Asia-Pacific Economic Cooperation (APEC) economies the average most-favored-nation (MFN)-applied tariff in 2009 was 6.17 percent, but China’s was 9.6 percent. In contrast, the U.S. rate was just 3.5 percent.<sup>56</sup> In terms of the percent of imports entering duty free, just 46 percent of Chinese imports did in 2009, compared to 76.3 percent of American imports.<sup>57</sup> Moreover, despite the fact that China signed on to the World Trade Organization’s Information Technology Agreement (ITA), it places 30

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percent tariffs on magnetic-tape-type video recording or reproducing apparatus; 24.5 percent on computer monitors; 20 percent on printers, copying machines, facsimile machines; and video recording and reproducing apparatus.<sup>58</sup> In addition, China restricts imports through a lack of transparency for customs regulations, burdensome documentation requirements, and inconsistently applied product certification requirements.<sup>59</sup>

#### Exemption from VAT and Other Taxes

China, like many nations, imposes a value-added tax that has the advantage of being border-adjustable (the VAT is rebated on exports but imposed on imports). In fact in 2009, China's VAT taxes on imports, combined with tariffs and other import duties in 2009 accounted for more than 20 percent of Chinese central government revenue, while the comparable figure for the United States was just 1.4 percent.<sup>60</sup>

In addition, China has attempted to manipulate the VAT to gain even more advantage. We saw a specific example of this when the Chinese government created a tax scheme that blatantly violated the WTO when it applied a 17 percent VAT to foreign-produced integrated circuits (ICs) used in the semiconductor industry, a 6 percent VAT on domestic production and a mere 3 percent VAT on integrated circuits both designed and produced in China.<sup>61</sup> China implemented this policy in an effort to build up its domestic IC industry in order to reduce its reliance on U.S. imports, and in so doing cost U.S. producers over \$300 million annually.<sup>62</sup> China aborted this VAT policy only after the United States filed a WTO case contesting it. China is also considering introducing a VAT refund policy for software purchases firms make (by itself a good, pro-growth policy) but the VAT refund would apply only to domestic purchases, not imports.<sup>63</sup>

#### Helping Chinese-Owned Firms

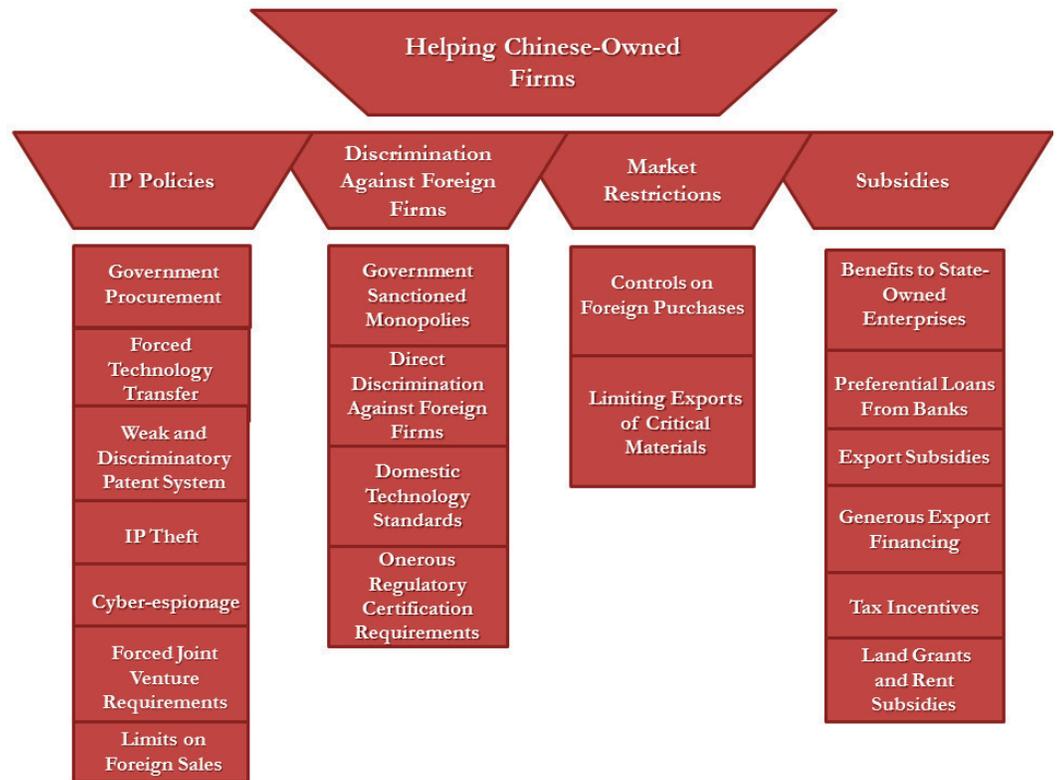
From the late 1970s to the mid-2000s, the Chinese government was content to have its economy grow through an array of mercantilist policies that reduced the costs of producing and exporting from China while at the same time raising the price of imports. But, as discussed above, in 2006 the Chinese strategy shifted from attracting FDI to supporting “indigenous innovation” in Chinese-owned firms. To do that China has expanded or put in place an array of policies that discriminate against foreign-owned firms in favor of Chinese-owned firms<sup>64</sup> (See Figure 3) These take numerous forms:

#### Government (and SOE) Procurement

Though China promised to accede to the Government Procurement Agreement as soon as possible as part of its entrance to the WTO in 2001, ten years have elapsed without it doing so. As a result, their government procurement law still includes a provision requiring that goods and services be purchased domestically. This is a considerable policy tool since at least 20 percent of goods and services in China are purchased by government.<sup>65</sup>

But China goes beyond just buying domestically, to preferentially buy from Chinese firms rather than foreign ones producing in China. As the head of procurement of one provincial government agency stated, “We are using money from taxpayers so of course we should buy from local Chinese companies.”<sup>66</sup> For example, a U.S. auto manufacturer with a joint

venture in China has recently told some of its U.S.-based suppliers that the provincial authorities where it is based have required it to source from Chinese-based and -owned suppliers.



**Figure 3: Chinese Mercantilist Policies Favoring Chinese-Owned Firms.**

China has introduced these “buy local” policies at both the provincial and national levels. As the *Global Trade Alert* notes:

In some Chinese provinces ‘buy local’ clauses are often implemented discriminating against foreign products. There have been reports that a number of eastern coastal provinces in China are giving priority to locally manufactured products (e.g. automobiles and home appliances) for local procurement and purchases and requiring companies to source raw materials or equipment locally... Many of these ‘encouragements’ seem to be made through personal contacts rather than communicated through written form.<sup>67</sup>

In other cases, China has tried to make the preference for local procurement explicit. For example, on May 12, 2009, the Ministry of Information Industry issued a Planning Release entitled “*Restructuring and Revitalization of Planning for the Equipment Manufacturing Industry.*” Among the policy suggestions, the Ministry recommended that measures be drafted encouraging the use of equipment made by Chinese firms, including through insurance mechanisms that would favor such technologies and equipment.<sup>68</sup>

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China uses standards requirements as another tool to enforce local purchasing. For example, the Chinese Ministry of Public Security (MPS) adopted the Multi-Level Protection Scheme (MLPS) to secure the information systems operated by Chinese government agencies and operators of critical infrastructure. The scheme uses five different levels to classify the importance of information handled on an IT system in relation to national security, with Level Five as the most sensitive systems. However, the *Administrative Measures for the Multi-Level Protection of Information Systems* issued in 2007 requires systems administrators for Level Three and above systems to procure domestic IT security products.

China took perhaps the strongest step to implement its indigenous innovation strategy in November 2009 with its “indigenous innovation product accreditation” policy—a list of products invented and produced in China that would receive preferences in Chinese government procurement.<sup>69</sup> To be eligible for preferences, products would have to contain Chinese proprietary intellectual property rights. Moreover, the original registration location of the product trademark needed to be located within China. Discriminating in government procurement on the basis of intellectual property rights lies outside accepted international practice and acts as a barrier for most foreign companies—even those that have invested significantly and manufacture in China—seeking to sell to China’s large government procurement market. For example, of the 523 accredited products listed in the Shanghai municipal government’s catalog, only 2 were made by foreign-invested enterprises—both from Chinese-foreign joint ventures with majority Chinese ownership.<sup>70</sup> Of forty-two products listed in the Beijing catalogue, only one came from a foreign-invested enterprise. On Nanjing’s list, there were none.<sup>71</sup> As Thomas Hout and Pankaj Ghemawat describe in the *Harvard Business Review*, China’s goal with its indigenous innovation policy is no less than “creating a tipping point in which multinational corporations will have to locate their most-sophisticated R&D projects and facilities in China, enabling it to eventually catch up with the U.S. as the world’s most advanced economy.”<sup>72</sup>

As noted above, it was only considerable pressure from foreign companies and governments that the Chinese State Council rescinded these indigenous innovation product catalogues at all levels of government in December 2011. Whether this will have any real effect is too early to tell. The Chinese governments could very well continue to use the product catalogues as informal guides to procurement decisions.<sup>73</sup>

Moreover, the rescission does not apply to purchases made by China’s state-owned enterprises (SOEs), to the National Development Reform Commission concession projects, including the acquisition of turbines for large wind farms, nor to any of the sixteen major priority projects contained in China’s Medium and Long Term Plan for Scientific Development.<sup>74</sup>

In addition, in November, 2011 the Chinese Ministry of Industry and Information Technology published a Request for Feedback draft of its “Guiding Catalogue of Indigenous Innovation in Key Technologies and Equipment.” It states, “The catalog will provide guidance for enterprises developing new equipment products urgently needed in

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*In China it is commonplace to require that firms transfer technology in exchange for being granted the ability to invest in China.*

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the market, and will provide the basis for all levels of government, financial institutions, and funds to use all kinds of economic, administrative, and legislative methods to support the development of the equipment manufacturing industry.” Included in the catalog are technologies like high-end printing machines, intelligent control systems, civil aircraft, and photovoltaic producer equipment. The catalog does not refer to President Hu Jintao’s January 2011 commitment to ensure that there will be no discrimination against foreign companies in China.

But procurement linked to domestic production and indigenous innovation is an issue not only at government agencies. SOEs and other firms with ties to the government also engage in it. For example, of the six buyers who have committed to buy China’s domestically produced large passenger plane, four of the six are state-owned and one has close ties with a provincial government.<sup>75</sup> The government “encourages” Chinese airlines to buy planes produced by Chinese aviation companies (e.g., COMAC). We see the same dynamic in telecommunications, where the three major state-owned telecommunications services providers are “encouraged” by the central government to buy telecomm equipment from Chinese-owned suppliers. The Ministry of Industry and Information Technology reportedly maintains an internal circular that instructs telecom companies to buy domestic equipment.<sup>76</sup> The reality is that access to Chinese government procurement by foreign producers in China remains severely limited.<sup>77</sup>

#### Forced Technology Transfer

China’s accession agreement to the WTO contains rules forbidding them from tying foreign direct investment to requirements to transfer technology to the country.<sup>78</sup> Yet, in China it is commonplace to require that firms transfer technology in exchange for being granted the ability to invest in China. In the *Catalogue for the Guidance of Foreign Investment Industries (2007)* joint ventures with foreign firms have to be approved, and technology transfer agreements reached within joint venture contracts must also be submitted for approval. The guidelines encourage transfer of technology.<sup>79</sup>

Sometimes this process takes the form of mandatory licensing of technology. As BASF Chairman and Chief Executive Jürgen Hambrecht stated, foreign companies doing business in China face “forced disclosure of know-how.”<sup>80</sup> Sometimes this is in the form of requirements to establish R&D facilities where the technology often “goes out the back door” in the form of Chinese researchers who leave to take the technology to Chinese firms. As one publication stated, the Chinese central government requires foreign firms:

To form joint ventures with its national champions and transfer the latest technology in exchange for current and future business opportunities. Companies that resist are simply excluded from projects. The Chinese government uses the restrictions to drive wedges between foreign rivals vying to land big projects in the country and induce them to transfer the technologies that state-owned enterprises need to catch up. Executives working for multinational companies in China privately acknowledge that making official complaints or filing lawsuits usually does little good.<sup>81</sup>

In almost all cases, these are not explicit written demands, for China knows that this would violate its WTO accession agreement. Rather, they are implicit, hidden agreements. Small

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nations lack the market power to make these kinds of demands, but China offers the prospect of a growing market of 1.3 billion consumers for foreign companies that find it difficult to resist the quid pro quo of technology for sales.

One of the most recent cases of this involved General Motors, which looked to start selling its electric hybrid vehicle, the Volt, in China. The Chinese government began placing “heavy pressure on the company to share some of the car’s core technology.”<sup>82</sup> Specifically, the Chinese government precluded the Volt from qualifying for purchase subsidies totaling up to \$19,300 a car—which are available for alternative fuel vehicles manufactured in China—unless General Motors agreed to transfer the engineering secrets for one of the Volt’s three main technologies (electric motors, complex electronic controls, and power storage devices) to a joint venture in China with a Chinese automaker. In contrast, U.S. tax credits for the purchase of energy-efficient alternative fuel vehicles are not restricted to domestic cars nor are foreign auto manufacturers denied them unless they transfer technology to the United States. For its part, Ford Motor Company, which is currently conducting demonstration projects of electric cars in China (and plans to launch commercial sales there), has already acceded to China’s technology transfer demand. Ford will transfer at least one of the three core electrical vehicle technologies to a Chinese joint venture partner: the civilian automotive affiliate of China Weaponry Equipment, a large contractor for the People’s Liberation Army.<sup>83</sup>

This is often par for the course, especially since 2006. China has done this with other car makers. It has always had a requirement that foreign auto makers open factories only as joint ventures. But recently China has begun to pressure foreign carmakers like GM and Nissan to build domestic brands with Chinese partners. Only after Volkswagen promised to build an electric car with a Chinese company, was the company allowed to build a new factory in Foshan.<sup>84</sup>

We also saw this kind of thing in China’s development of its high-speed rail system, which it wanted in and of itself and for the status that came with such a system. In 2002, the government unveiled a high-speed rail system produced by Chinese companies. However, the government soon recognized that the system was substandard and would have to be scrapped in favor of a foreign-built rail system. In hindsight, this outcome should have been fairly obvious to Chinese economic planners since high-speed rail technology is extremely complex and takes many decades to master.

But rather than buy the technology they needed (per the theory of comparative advantage), the Chinese government structured procurement in such a way as to force foreign technology transfer in exchange for market access. Looking at the growth of the Chinese market, foreign firms could hardly resist such a Hobson’s choice, knowing that if they did resist, China would award the contract to a competitor that was hungrier for short-term sales, and China would still get the technology. And so the world’s main high speed rail producers, Bombardier (Canada), Alstom (France), Siemens (Germany), and Kawasaki (Japan) submitted bids for sales and tech transfer. The winning bidder, Kawasaki, had to develop the local supply chain for train components, train Chinese engineers (including

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sharing their entire know-how and catalogue of technologies), and even bring Chinese engineers to its Japanese manufacturing facilities for training.

In such a monoposonistic arrangement (where the buyer is so large it has market power) companies were hard pressed to resist demands for tech-transfer. And China's strategy was not just to learn, it was to displace Kawasaki from the Chinese market and then to use its technology (combined with low costs through manipulated currency and massive subsidies) to outcompete the firm in foreign bids in other nations. This is not an anomaly but rather China's modus operandi in industry after industry.

Since the WTO prohibits these types of deals, China hides them in the informal agreements that Chinese government officials and state-owned enterprises force on foreign investors. The agreements may also involve other WTO-inconsistent clauses, such as export performance and local content requirements, as other conditions for investment approval or to obtain a Chinese bank loan.<sup>85</sup> Foreign companies continue to capitulate because they have no choice; they either give up their technology or they lose out to other competitors in the growing Chinese market.<sup>86</sup>

#### Forced Joint Venture Requirements

In most nations foreign firms are allowed to freely invest in non-national security industries, and to purchase domestic firms. In China, foreign firms' investments, even in non-national security industries, are screened 100 percent of the time. Frequently, foreign firms are not permitted to wholly own their investments, and are required to enter into joint venture (JV) agreements with Chinese firms, often state-owned, in which the Chinese firm has control. These coerced agreements are designed in part to keep profits in China and as discussed next to allow Chinese firms to learn from the foreign firms so that they can later compete independently against them. For example, Ford Motor Company recently opened a number of automobile factories in China but was required to do so as a JV with Chinese automobile producer Chang'an Motors.<sup>87</sup> In some cases, the JV steals IP and other business secrets and then competes against the foreign company in violation of the original agreement. A case in point is the Illinois-based Fellowes Inc., one of the world's largest makers of office and personal paper shredders. To produce in China, Fellowes was required to enter into a JV with a Chinese company Shinri. But recently, the company's Chinese joint venture firm barred 1,600 employees from entering the plant, took all of its proprietary manufacturing production equipment and forced the venture into bankruptcy. Under the JV agreement, Fellowes owned the tooling and intellectual property used to manufacture the shredders in the factory. Now, however, with the IP and custom tooling, Shinri is planning to compete directly against Fellowes.<sup>88</sup> In February 2012 when Chinese Vice President Xi Jinping was visiting Los Angeles, he expected an event to unveil a joint venture between DreamWorks and two Chinese companies to create a new animation studio in Shanghai. The only way Dream Works could get into the Chinese market was to form a joint venture (and it may not have even needed to get into the Chinese market if China didn't limit the number of foreign movies allowed to be released in China.

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In 2010 Premier Wen Jiabao announced, “We will ... enable foreign businesses to get national treatment like their Chinese counterparts.” Yet, China’s system of investment screening is discriminatory, and would constitute a denial of national treatment under U.S. investment treaties and free trade agreements. China bound certain rights of establishment when joining the WTO, namely those for which it scheduled commitments under the General Agreement on Trade in Services (GATS). In the WTO Doha Development Round, a key sticking point has been Chinese unwillingness to expand its GATS commitments. Thus, Chinese statements that it gives non-discriminatory treatment to foreign businesses are not accurate.<sup>89</sup>

### Controls on Foreign Purchases

The Chinese government has a system in place to control foreign purchases by enterprises in China. China uses these controls as a way to drive domestic technology development. For example, the Ministry of Finance states:

Government procurement shall purchase domestic products. In cases where there is the need to purchase imported products, the examination and verification shall be implemented. When the purchaser plans to procure major technical equipment and major technical industry technologies restricted by the state for import, the opinions of the National Development and Reform Commission shall be presented. When the purchaser plans to procure major scientific instrument and equipment restricted by the state for import, the opinions of the Ministry of Science and Technology shall be presented.<sup>90</sup>

China not only puts limits on foreign purchases of technology-based products, it uses the limits to support technology transfer. The MLP states:

If a purchaser cannot get the products it needs within China’s territory or cannot get them under reasonable commercial conditions (excluding products to be used outside the Chinese territory), it should obtain a written confirmation by an authoritative state confirmation institution before starting its purchase activities. In purchasing foreign products, the principle of being conducive to making innovation independently by enterprises or to digesting and absorbing core technology should be adhered to and priority should be given to purchasing products whose production technology is also transferred.<sup>91</sup>

In other words, permission to purchase foreign products is easier if the foreign company also transfers production technology. The MLP proposed that:

Enterprises undertaking important state science and technology projects, key projects in national science and technology plans, important national projects for the research and development of technology and equipment, and important projects for introducing technology and digesting, absorbing and re-innovating such technology are exempted from import tariff and value-added tax of the import link in importing crucial equipment, raw materials, parts and components that are not produced domestically.<sup>92</sup>

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*China offers the prospect of a growing market of 1.3 billion consumers for foreign companies that find it difficult to resist the quid pro quo of technology for sales.*

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In 2007, the Ministry of Finance issued “Measures for the Administration of Government Procurement of Imported Products” that in the import approval process called for favoring foreign suppliers that provide technology transfer and training to Chinese-owned firms.<sup>93</sup>

### Weak and Discriminatory Patent System

Under the Chinese patent system it is extremely easy for a Chinese firm to be granted “utility model and design patents” (as distinct from invention patents that are more akin to U.S. patents). In 2009 these “junk patents” constituted approximately three-quarters of Chinese patents issued to Chinese-owned firms.<sup>94</sup> Chinese government also provides significant subsidies to firms to file patents, sometimes in excess of the patent filing fees. This weak patent system makes it easy for Chinese firms to countersue in response to infringement suits by foreign competitors. In addition, until the Chinese government rescinded its indigenous innovation product catalogues, it intended to “give support to enterprises that develop the technology and products listed in the catalogue in the application for a patent.”<sup>95</sup> In other words, it would have been easier to obtain a patent if the firm filed to protect a technology the government has identified.

A recent article in *The Wall Street Journal* suggests that almost 95 percent of the patents filed in China are filed domestically with the State Intellectual Property Office (SIPO) rather than internationally. Of these more than half are for foreign innovations and are filed with the sole intention of suing the same for patent infringement.<sup>96</sup> Chinese firms are able to take advantage of an intentional legal loophole where China does not recognize foreign patents.

China’s patent policy makes it easier for domestic retaliation by Chinese companies that face overseas IPR lawsuits from foreign competitors. One example was the case where the CHINT Group, a Chinese firm, sued the French electronics firm Schneider for a patent violation. Schneider had filed suit against CHINT Group for infringing on its patents and won some lawsuits in Germany and Italy. In China, SIPO granted the Chinese firm a weak utility model patent enabling it to counterattack and make the claim that Schneider was using its technology illegally. The Chinese Intermediate People’s Court fined Schneider about \$50 million dollars. Many argue that this was a reflection of a clear message coming from the central government warning multinationals not to threaten Chinese companies with patent lawsuits.<sup>97</sup> The newest case involves the use of the Apple trademark name “iPad. A Chinese company Proview Technology claims that it owns the trademark to the name, even though Apple had previously bought the rights to the name. From Proview, a company that was delisted from the Hong Kong stock exchange for financial difficulties, is demanding \$1.6 billion from Apple. And Chinese provincial governments have been to order the removal of iPads from stores. While Apple may go to court, rather than settle, it is not at all clear that the Chinese courts can be counted on to rule in an impartial manner. None of this is to say that firms do not engage in aggressive offensive use of their IP in the United States. But the jurisprudence is better developed, and the procedural rules ensure a great deal more transparency and procedural fairness, protecting all rights holders in the same manner.

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## IP Theft

Even though China signed on to the TRIPS (Trade-Related Aspects of Intellectual Property Rights) agreement, it helps its domestic firms and hurts foreign firms by turning a blind eye to intellectual property theft, even within its own government agencies. The U.S. International Trade Commission estimates that—in 2009 alone—Chinese theft of U.S. intellectual property cost almost one million U.S. jobs and caused \$48 billion in U.S. economic losses.<sup>98</sup>

We see this in a wide variety of areas, but perhaps the most egregious example is software piracy. For example, due to rampant piracy Microsoft Corporation's revenue in China in 2011 was only about 5 percent of what it was in the United States, even though personal computer sales in the two countries are almost equal.<sup>99</sup> In China, copies of Microsoft's core Office and Windows programs are available on street corners for two to three dollars each. Microsoft estimates that as much as 95 percent of its Office software and 80 percent of its Windows operating systems in China is pirated.<sup>100</sup> Some 240,000 Internet cafés in China rely on illegal copies of entertainment software.<sup>101</sup> Chinese firms even sell technology to allow users to circumvent encryption protection so they can pirate video games.

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*The Chinese State Council has postponed plans to audit central and local government agencies' use of software on the grounds that some local and provincial governments cannot afford to buy legal software.*

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Many in China even view piracy as simply a different kind of business model. As they see it, there's the make/buy IP business model, and the "steal IP" business model. Both are seen as legitimate. In an article in the *Journal of Science and Technology Policy in China*, edited by the Chinese Academy of Sciences, Sheng Zhu and Yongjiang Shi write about how the cell phone industry "cluster" in Shenzhen called Shanzhai is "turning to the Shanzhai ethos, starting with producing counterfeited mobile phones to rebel against the expensive world-leading brands. . . . The Shanzhai idea of rebellion has evolved into a desire to take on global corporations by producing copies of the world leading brands."<sup>102</sup> The view is that this kind of rebellion is almost "Robin Hood-like" as it provides cell phones for the masses at the expense of the greedy, rich Apples, Nokias, and LGs of the world. The authors go on to note how those in central government "tend to tacit consent the phenomenon."<sup>103</sup>

As bad as it is that private citizens and companies steal foreign IP, the fact that government agencies fail to legally procure—and even outright pirate—products or services made by foreign companies is even worse. Despite a five-year-old government order, at least 80 percent of Chinese government computers run versions of Microsoft Windows operating systems that were illegally copied or otherwise not purchased, not to mention scores of other Western software packages that are also pirated.<sup>104</sup> And the Chinese State Council has postponed plans to audit central and local government agencies' use of software on the grounds that some local and provincial governments cannot afford to buy software legally.<sup>105</sup> They could if the central government allocated some of the billions of dollars it uses annually to buy U.S. T-bills to pay for local government software purchases.

Nor is China's piracy confined to digital products, it's rampant with respect to physical products as well. For example, the U.S. Customs and Border Protection agency found that 79 percent of imports of U.S. trademark-infringing goods came from China (and an additional 10 percent came from Hong Kong).<sup>106</sup> In another telling case, the global

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agriculture firm Monsanto decided to open production and research facilities for advanced corn technology in China and proceeded to develop experimental fields growing genetically enhanced corn. It wasn't long before the advanced corn was systematically stolen, an effort most likely by the Chinese government to gain access to the IP embedded in the corn. Shortly after that, one Chinese producer of corn seeds saw a dramatic acceleration in its technological capabilities. In late 2007 I visited an "electronics mall" (in actuality a large building with hundreds of independent, inefficient vendors) in Guangzhou and saw scores of vendors selling fake iPods with the Apple logo clearly affixed (and also clearly fake). When asked if these were real, the vendors insisted that they were. This was not an alley far away from official eyes, this was within a mile of the provincial government headquarters. More recently, Chinese "entrepreneurs" have even opened twenty-two fake Apple stores, unlawfully using Apple's brand and logo in an attempt to mimic real Apple stores.<sup>107</sup>

This kind of technology theft not only hurts foreign companies, it can give Chinese companies a leg up on the competition because they can get IP without having to pay for it. A case in point is the California-based company Autodesk, the global leader in making computer animated design software (software used to design bridges, buildings, manufactured parts, etc.) and computer-generated imagery. (Autodesk's software brought us the world of Pandora in James Cameron's *Avatar*). But now Autodesk is experiencing a "Pandora's box" of Chinese IP theft, finding its software widely pirated by Chinese manufacturing firms. So some Chinese firms are now competing against U.S. manufacturers who have to factor into the prices they charge the cost of the Autodesk software, a cost many Chinese manufacturers unfairly avoid. This is a "piracy subsidy" they enjoy.

So great is China's desire to incorporate and assimilate Western technology that it also supports industrial espionage to steal trade secrets. A prime example is Boston-based American Superconductor (AMSC), which provides software, design, and hardware solutions for wind manufacturers and energy providers. American Superconductor's top customer, the Chinese-based wind turbine manufacturer Sinovel Wind Group, is facing criminal and civil actions for paying an AMSC employee to steal proprietary power-converter and control-system software, which it then used illegally in its wind turbines to meet electricity grid standards.<sup>108</sup> The employee, an engineer at one of AMSC's subsidiary's, was recently found guilty of industrial espionage in Austria. As a result of the theft, and the broken business relationship with Sinovel, AMSC has been forced to cut jobs and has seen profits fall.

A similar case involves the charges made by the U.S. Department of Justice against a business person with alleged links to the Chinese communist party. He is charged with paying former DuPont engineers for help in designing a chemical compound that Chinese firms are not yet capable of making.<sup>109</sup> Those are by no means the only cases of Chinese industrial espionage.<sup>110</sup>

As one Chinese central government official stated, "Enforcing IPR has not been done yet, and I don't know when it will be." Even when it is enforced, the penalty is usually a slap on the wrist. A case in point is the case of Wuyang Company vs. Microsoft, Adobe, and

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Autodesk. This was a case whereby Guangzhou Wuyang Steel Structure Corporation was found to have systemically used pirated copies of U.S. software from the three companies. While it is one of the few cases that have been prosecuted, the company received a fine of just 1.3 million Yuan (\$198,000), probably much less than the actual value of the software it pirated.<sup>111</sup>

### Cyber Espionage

China not only engages in intellectual property theft at home, it takes IP from other nations through cyber-espionage. While these attacks are difficult to attribute to the Chinese government, there is a widely held view that it is at least supportive of them. As one report found, “As few as 12 different Chinese groups, largely backed or directed by the government there, commit the bulk of the China-based cyber-attacks stealing critical data from U.S. companies and government agencies.”<sup>112</sup> For example, it was recently reported that Nortel Networks, the once giant Canadian maker of telecommunications equipment had its computer systems penetrated since as long as 2000, with technical papers, research-and-development reports, business plans, and employee emails being sent to addresses in Shanghai and Beijing.<sup>113</sup> Richard Clarke, former special adviser on cybersecurity to the Clinton and George W. Bush Administrations, has stated, “What has been happening over the course of the last five years is that China—let’s call it for what it is—has been hacking its way into every corporation it can find listed in Dun & Bradstreet.”<sup>114</sup> A U.S. government intelligence report states, “Chinese actors are the world’s more active and persistent perpetrators of economic espionage.”<sup>115</sup> Many foreign companies in China just assume that their electronic communications will be monitored by the Chinese government, even if they are encrypted. This is not about a poor country that doesn’t want to pay for software. This is about government-supported attacks to steal intellectual property from foreign companies, which is no different than if Chinese spies were on U.S. soil breaking into corporate R&D labs. U.S. companies invest over \$270 billion annually in R&D only to see some of the results stolen by China. While other governments, including the United States, may engage in cyber-monitoring, they don’t turn over what they find to private corporations.

### Government Sanctioned Monopolies

In most nations antitrust/competition policy is designed to ensure adequate levels of competition. In China, it is often designed to block foreign companies from competing against entrenched domestic monopolies. As a case in point, a monopoly controlled by the People’s Bank has been allowed to operate electronic payment systems for Chinese-currency credit cards, cutting foreign companies out of the sector. This forced the United States to bring a case against China before the WTO in September 2010 alleging that unfair restrictions were preventing foreign companies from providing certain electronic payment services in China.<sup>116</sup>

Moreover, there are many sectors in China dominated by state monopolies with respect to which China undertook no specific WTO commitments. China claims that its state-owned enterprises operate on commercial terms, consistent with its more general WTO commitments. But with the advantages they receive, this belies the notion of what normal best practices would consider as commercial. As discussed below, one analysis found that

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*China has established procedures that require foreign companies to submit their IT products for a review that is both time-consuming and costly and that could give Chinese IT companies access to foreign intellectual property.*

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on average SOE's rate of return absent state intervention would be 6.2 percent.<sup>117</sup> The study recommended that rules be adopted to discipline these firms, and that the special provisions in China's antimonopoly law on government actions that have anticompetitive effects be enforced. These rules are somewhat analogous to U.S. jurisprudence under the Constitution's interstate commerce clause. Their enforcement would serve to remove barriers to trade within China, benefitting Chinese and foreign-owned firms alike.

Some of the antitrust provisions in China's antimonopoly law have also raised serious questions among U.S. and EU antitrust experts, who say that the law could be used as a tool against foreign company actions that affect Chinese markets.

The MLP proposed that, "[We shall] prevent the abuse of intellectual property that unfairly restricts the market mechanism for fair competition and may prevent scientific-technological innovation and the expansion and application of scientific-technological achievements."<sup>118</sup> And China's 2007 anti-monopoly law built on this, with Article 55 stating, "This Law is not applicable to undertakings' conduct in exercise of intellectual property rights pursuant to provisions of laws and administrative regulations relating to intellectual property rights; but this Law is applicable to undertakings' conduct that eliminates or restricts competition by abusing their intellectual property rights."<sup>119</sup> Foreign companies fear that this provision will be used to take legal action after companies that hold strong IP rights. Indeed, the Chinese law appears to allow compulsory licensing of IP by a "dominant" company that refuses to license its IP if access to it is "essential for others to effectively compete and innovate."<sup>120</sup>

This kind of provision could easily be used as a guise to force foreign companies to license their technology if they want to sell or otherwise do business in China.

#### Direct Discrimination Against Foreign Firms

Increasingly, foreign firms face discrimination by Chinese governments. The American Chamber of Commerce states in China's 12th annual "*Business Climate Survey*" that American business owners are increasingly concerned about discriminatory government regulations and other policies that favor domestic companies. The Google case was perhaps the highest visibility one. Google pulled out of China because of discriminatory treatment. (It is even thought possible that China intentionally slowed down Google search results and disrupted service in other ways.)<sup>121</sup> As Nick Yang, cofounder of several Chinese technology companies stated, "The Chinese government itself does not have a positive and supportive view of foreign search engine companies in China."<sup>122</sup>

One way China discriminates against foreign firms is through differential treatment with regard to tax, transfer pricing, antitrust, visa, and customs laws.<sup>123</sup> For example, a *Compliance Week* article notes, "The [Chinese] government does indeed seem to be giving the local companies a pass. While bureaucrats are raiding foreign-run factories, imposing sizable punishments on multinationals, and making demands on transactions that have little to do with China, enforcement of other domestic regulations come up almost comically short." The article goes on to note, "While the regulators are going after foreign companies, they appear to be taking it easy on local enterprises... This double standard may indicate that the great enforcement crackdown is as much a matter of industrial policy as it

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is an effort to raise taxes and prevent economic concentration.”<sup>124</sup> China has employed other means to discriminate against foreign companies in China. For example, the Chinese government banned foreign-owned wind farms from selling carbon-emission credits to businesses in Europe, while Chinese-owned wind farms are allowed.<sup>125</sup>

### Domestic Technology Standards

Most technology and product standards around the globe are developed through international, voluntary, industry-led efforts. Firms meet and agree upon standards that are then used throughout the world. But China has decided to use home-grown standards as a way to gain competitive and hopefully monopolistic advantage. As the MLP stated, “The state should establish a platform to service standards, support and speed up the transformation of advanced foreign standards into domestic standards, and give key support to enterprises that promote the formation of technological standards with ourselves as the dominant factor through re-innovation.” The 12<sup>th</sup> Five-Year Plan proposed to “encourage the adoption and promotion of technical standards with indigenous intellectual property rights.”<sup>126</sup> As one Chinese official explained it, “Domestic standards are critical for China’s development. First tier companies sell standards. Second tier companies sell patents. Third tier companies sell products.” And after joining the WTO, these non-tariff barrier tools are becoming a more central part of China’s mercantilist strategy. As China scholar Dieter Ernst points out, the Standards Administration of China justifies its nationalistic and protectionist standards strategy on the grounds that “China’s accession commitments to the WTO have substantially reduced the use of most other trade restrictions such as tariffs, import quotas, and licensing requirements.”<sup>127</sup>

As a result, China lags significantly behind other economies in developing a pro-innovation standards policy. According to the WTO, in 2007, around 14.5 percent of national standards, 15 percent of professional standards, and 19 percent of local standards in China were mandatory.<sup>128</sup> Moreover, voluntary standards can become mandatory if they are referenced in mandatory conformity assessment procedures. In 2007, only 46.5 percent of Chinese national standards were equivalent to international standards.<sup>129</sup>

China has established a wide array of home-grown technology standards. China gave its wireless telecommunications equipment manufacturers and operators a competitive advantage by developing a domestic standard and then forcing foreign companies to adopt it for their Chinese products and operations.<sup>130</sup> In addition to mandating standards, the Chinese government dominates the process and runs it without international consensus. It drafts many standards without foreign, or even public, input. If foreign representatives are allowed to participate at all they can do so only as observers with no voting rights.<sup>131</sup> Thus Datang Corporation, a Chinese energy company, developed the country’s domestic 3G wireless standard (TD-SCDMA—Time Division-Synchronous Code Division Multiple Access) with explicit Chinese government support, little foreign participation (only minor technology development by Siemens), and without consensus.<sup>132</sup> Although China submitted the standard for approval by the ITU in 1998 and it was subsequently approved, this was a mere formality.

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China’s goal with TD-SCDMA was to force foreign telecommunications equipment manufacturers to adopt the standard in order to sell their products to Chinese service providers in the potentially huge and lucrative 3G wireless market. Not only would they be forced to design their equipment to conform to the standard, they also would have to pay royalties to Datang to use it. The only problem for China was that TD-SCDMA needed a lot of development before it could compete with the existing 3G standards—CDMA2000 and W-CDMA. That made China hold off on granting wireless licenses for operators to deploy 3G services until TD-SCDMA was ready for prime time. The delay in issuing licenses gave the existing standards an advantage because they already had subscribers around the world, including in Asia. It also gave foreign telecommunications equipment providers time to design their equipment so that it would be compatible with all the 3G standards, including TD-SCDMA.<sup>133</sup> In 2008, the Chinese government forced China Mobile, the world’s largest mobile operator, to adopt TD-SCDMA technology, but the firm has had difficulty because of the lack of TD-S handsets. In the meantime, Chinese handset manufacturers Huawei and ZTE have been doing well enough abroad with no help from the TD-SCDMA standard.<sup>134</sup>

Because the Chinese government knows that it has considerable “market power” over foreign companies due to its sheer size, it knows that unless challenged by other governments or the WTO it has leeway in unilaterally setting standards to favor domestic firms and to force foreign firms to pay licensing fees. Such was the Chinese government’s motivation when it announced that by June 2004 the Wireless Local Area Network Authentication and Privacy Infrastructure (WAPI) standard would be mandatory for both domestic and foreign companies to use for Wi-Fi technology, even though an international standard had existed since 1997.<sup>135</sup> The central government also has required through informal administrative guidance and through government bidding documents that Chinese telecommunications providers, which are SOEs, to only sell devices that are WAPI based. While the government claimed WAPI was justified because it was more secure than the existing standard, there was no evidence of this. Its true motivation was to force foreign companies to pay license fees to Chinese companies and to surrender U.S. technology.

In particular, before U.S. companies could use the standard they needed to obtain the encryption algorithms and to do that they had to give up proprietary technical specifications to their Chinese competitors. When the U.S. government threatened to file a WTO complaint against China for violating the WTO’s Technical Barriers to Trade Agreement by mandating a standard that constituted an illegal trade barrier, China dropped its mandate.<sup>136</sup> However, this has not deterred the Chinese government from continuing to support the standard by requiring that WAPI be used in all government procurement.

Additionally, the Chinese government has supported the development of domestic radio frequency identification (RFID) standard, without international participation or consensus. It does not want to pay royalties to use the existing electronic product code (EPC) standard developed through a consensus process by EPCglobal with participants from numerous

nations. Moreover, on February 13th, 2012, MIIT published its *12th Five Year Plan for Internet of Things* which stated that over 200 national or industrial standards should be set before 2015.

There are at least fifteen international information technology standards that every country has adopted through a regular, open, industry-led standards-setting process where China is trying to establish its own domestic standards, several of which the country is seeking to make compulsory in products sold in China. Table 2 summarizes several of these proprietary technology standards.

Technology-Product Category	International Standard	Chinese Standard
Wireless—Home Networking	Wi-Fi	WAPI
Wireless—Mobile TV	3G; WiMAX	TD-SCDMA; McWii
Wireless—Storage	RFID	China RFID
Security—Personal Computers	TPM (Trusted Protocol Manager)	TCM (Trusted Cryptographic Manager)
Consumer Electronics—Terrestrial TV	DVB-T	DTMB (Compulsory)
Consumer Electronics—Satellite DTV	DVB-S	ABS-S
Consumer Electronics—IPTV	Open IPTV	CCSA
Video Codec	Various MPEG formats	AVS
DRM (Digital Rights Management)	Marlin, OMA DRM, or DTCP-IP	China DRM

**Table 2: Chinese IT Standards**

China’s practice is to change the standard a bit, creating a version that doesn’t have the international intellectual property embedded in it, so that it doesn’t have to pay the royalties. For example, every computer contains a microchip that manages the security features of the machine (e.g. authentication.) TPM (Trusted Protocol Manager) was established as an international standard four years ago. TCM (Trusted Cryptographic Manager) is China’s version of TPM. China’s trusted computing module (TCM) requires use of Chinese algorithms and requires conformance with TCM specifications, which until recently were only available to Chinese companies. As Peter Swire writes “These policies effectively shut the global TPM standard out of China’s domestic market. Further, China uses commercial encryption regulations as the rationale for prohibiting the import of platforms that employ TPMs into China.”<sup>137</sup> Why is China doing this? What’s the value to the global economy to have a competing standard when the global community has already

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collaboratively developed an effective standard? The answer is that China is essentially trying to strip others' intellectual property from these standards in order to avoid paying royalties.

A recent issue of standards manipulation concerns wireless standards. On August 4, 2011 the China Communication Standardization Association (CCSA) released Enhanced Ultra-High Throughput (EUHT) standards for final review. EUHT is a wireless LAN standard proposed by Nufront, a Chinese company that received national science and technology funding. The idea is for the Chinese government to require use of this standard in China, even though it has deficient technical specifications and was developed with a non-transparent process.

### Onerous Regulatory Certification Requirements

China has established procedures that require foreign companies to submit their IT products for a review that is both time-consuming and costly and that could give Chinese IT companies access to foreign intellectual property. Since August 2003, U.S. companies that want to sell IT equipment, devices, appliances, and components must undergo a safety and quality review in order to obtain a China Compulsory Certification (CCC) mark. The CCC is similar to the Underwriters Laboratory (UL) safety-certification mark for electronic and other products in the United States, but with two important differences. First, unlike the CCC mark—which as its name suggests is compulsory—the UL is a voluntary industry standard. Second, the UL is a non-profit and independent organization that is not affiliated with either the U.S. government or any U.S. companies. Only UL employees, who are required to sign a confidentiality agreement, perform product evaluations and tests. In contrast, the CCC mark is administered by the China National Regulatory Commission for Certification and Accreditation, a government organization. More importantly, the technical committees that evaluate the products for the CCC mark include industrial and other experts that may be affiliated with Chinese, who could get access to the intellectual property. While it would be difficult to know if outright theft has occurred, the U.S. government is concerned enough to have raised this issue in its annual 2007 National Trade Estimate Report.<sup>138</sup>

### Limits on Foreign Sales

One direct way to protect Chinese industry is to limit sales of foreign-made products and services. Perhaps the best example is in the movie industry where the central government has set a quota of twenty foreign revenue-sharing films that can be shown in China in a year, even though as part of its 2001 agreement to join the WTO it had agreed to lift that. And in order to ensure that its domestic distributor has the best bargaining power against foreign filmmakers the Chinese government has established a monopoly over movie distribution that requires foreign movie makers to negotiate with just one distributor for rights. China justifies this limitation on the basis of cultural protection but if this really were the reason it would take real steps to curtail widespread foreign movie piracy in China.

Beyond limiting electronic payment services, as previously discussed, China also limits other foreign banking services, including by closing its pension market to U.S. pension

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managers. It also limits electronic payment services. A monopoly created by the People's Bank has been allowed to operate electronic payment systems for Chinese currency credit cards, cutting leading foreign companies out of this sector. On September 15, 2010, the United States brought a case against China before the WTO alleging unfair restrictions preventing foreign companies from providing electronic payment services in the country.<sup>139</sup> According to the U.S. International Trade Commission of 72 nations examined, China was the 55<sup>th</sup> more restrictive when it came to non-tariff measures affecting trade in the property and casualty insurance industry.<sup>140</sup>

### Limiting Exports of Critical Materials

There are some areas where China does not want to ramp up exports, namely materials that are scarce on the global marketplace in which they have a critical advantage. For example, the Chinese government placed restrictions on the exportation of coke, an essential input into making steel. In 2004 and 2005, China imposed a quota on exports of coke of 14.3 million metric tons. This caused the price for exported coke to rise which raised the prices for U.S. integrated steel producers and their customers.<sup>141</sup>

More recently, the Chinese government has limited exports of rare earth elements (REE) which are a group of seventeen minerals that are widely used in high-technology products such as hybrid cars, tablet computers, high performance magnets, and light-emitting diodes. Realizing that they controlled significant sources of REE global production and that this could be used as a leverage point, in July 2010, the Chinese government significantly reduced its export quotas on rare earth elements, causing world prices to greatly increase compared to domestic Chinese prices. For example, in April 2010 the price for cerium oxide was \$5/kg, but after the export controls the price skyrocketed to \$151 Kg in May 2011. At the same time domestic prices were just \$29/kg. Moreover, the Chinese government made it clear to industrial consumers of REE's that they could have all they wanted at a cheap price if they just moved their factories to China. Both as the central source of extraction and by restrictively controlling the exports of many rare earth elements vital to the production of high-tech products, China tries to force the manufacturing of those products to center in China. As further inducement, it makes those elements available at a far cheaper price to in-country manufacturers.

### Benefits to State-Owned Enterprises

There are about 150 large SOEs that report directly to China's central government and there were another 26,000 in existence at the end of 2006.<sup>142</sup> As the McKinsey Global Institute notes, "Thousands more fall into a gray area, including subsidiaries of these 150 corporations, companies owned by provincial and municipal governments, and companies that have been partially privatized yet retain the state as a majority or influential shareholder."<sup>143</sup> In fact, SOEs still account for about 40 percent of GDP, and a greater share on other measures.<sup>144</sup> The explicit state share of employment was 57 percent as of October 2010, and the state-owned Assets Supervision and Administration Commission indicates that the assets of its firms have grown from the equivalent of 60 percent of GDP in mid-2003 to 62 percent of GDP in mid-2010.<sup>145</sup> Moreover, China's 121 biggest SOEs increased their total assets increase from \$360 billion in 2002 to \$2.9 trillion in 2010 in part because during the recent financial crisis approximately 85% of China's \$1.4 trillion

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in bank loans went to state companies.<sup>146</sup> And these SOEs are under direct control of the Chinese Communist Party Central Committee as evidenced most recently by its 2010 directive to SOEs titled “Three-Major, One-Large.”

These enterprises, many of which compete directly with foreign firms, receive significant benefits from all levels of Chinese governments. A major benefit is not to have to make a profit. An in-depth 2011 study by the Unirule Institute, an independent Chinese think tank, found that in 2009 the return on equity was about half the rate of non-state owned enterprises, a substantial “subsidy” in and of itself. But without their government granted advantages, including preferential financing from state banks and free land, Chinese SOEs would have operated at a 6.29 percent loss from the period of 2001 to 2009.<sup>147</sup> The ability to consistently lose money amounts to a considerable subsidy compared to private foreign firms that must charge enough to make a reasonable profit.<sup>148</sup> Another is the ability, as discussed above, to get preferential government financing. As one study stated, “Our finding reinforces the widely-held view that the Chinese financial system allocates resources towards poorly performing SOEs.”<sup>149</sup>

But SOEs receive other benefits as well, including direct subsidies. One study of how local Chinese governments help SOEs manage their earnings so that their stock listings are more favorable found that “earnings management in China is not simply a management choice, but involves collusive manipulation by local governments. . . . Local governments have alternative ways to support listed firms, such as granting taxation preference or favoring listed firms in the project approval process. However, the government subsidy is a more direct and convenient way to help listed firms in earnings management.”<sup>150</sup> Indeed, an SOE brings with it a “bodyguard” in the form of the Chinese state. As Hon Chan has argued:

The advantage of having an enterprise affiliated with the SASAC (State-owned Assets Supervision and Administration Commission) is distinct and overwhelming. For example, Air China’s recent successful maneuvering to block Singapore Airlines from buying out China Eastern Airlines is a clear example of how central enterprises, as national champions, can draw on support from the home market and the Chinese bureaucracy (the SASAC) to edge out outside players.”<sup>151</sup>

He went on to note: “All these policy restrictions give SOEs a powerful tool for demanding soft budget constraints, policy-based low interest loans, market-invasive state subsidies and profit-sharing schemes and similar beneficial arrangements.”<sup>152</sup>

#### Preferential Loans From Banks

State-owned banks account for over 50 percent of lending in China.<sup>153</sup> As such they are pressured by the central government to make loans to Chinese enterprises at more favorable rates or terms than these firms otherwise would get. As the MLP proposed, “The China Development Bank should grant soft loans for high-tech enterprises within the scope of soft loans approved by the State Council for equity participation investment in projects.”<sup>154</sup>

But the preferential lending is not just from state-owned banks. The MLP stated that government should “guide commercial financial institutions to support making innovation

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independently (and) use funds, interest discounts, guarantees and other means to guide various kinds of commercial financial institutions to support making innovation independently and industrialization.”<sup>155</sup> The plan went on to note that “banks set up for policy considerations, commercial banks and other financial institutions should make experiments on doing business of mortgaging intellectual property rights (IPR) at selected points.”<sup>156</sup> In other cases, banks have converted nonperforming loans into shares of Chinese companies to reduce their level of debt. Sometimes this takes the form of debt forgiveness.<sup>157</sup>

### Export Subsidies

Even though export subsidies are illegal under the WTO, China uses them to support Chinese firms.<sup>158</sup> Moreover, despite the fact that the Chinese government committed to eliminating or substantially reducing export subsidies (and particularly those for loss-making state enterprises) as a condition of its WTO accession deal, it nevertheless reported more than \$2.4 billion of export subsidies in 2005.<sup>159</sup> And in 2007 China devoted more than \$15 billion on export-enhancing subsidies to its steel industry.<sup>160</sup> And while China announced reductions in steel subsidies, the reductions are focused on commodity-grade steels, and it has increased VAT rebates on exports of value-added steels.<sup>161</sup> The United States has taken legal action at the WTO against China’s support of its steel industry, alleging that the country unfairly offers cash grants, rebates, and preferential loans to its steel exporters.<sup>162</sup>

But the subsidies go far beyond steel. USTR recently counter-notified nearly 200 Chinese subsidy programs of the WTO that China had failed to notify, the majority of them pertaining to Chinese subsidies for the country’s clean energy industries, particularly its solar and wind power industries. Irrespective of whether or not those subsidies violate the WTO, the very fact that China did not report them violates the country’s commitments under the WTO agreement. Subsidies notifications are required annually under WTO rules, so that other countries can study the subsidies and determine whether any of them violated trade rules that prohibit using government money either to help companies buy market share in other countries or to discourage imports.<sup>163</sup> However, since becoming a WTO Member in December 2001, China’s only notification came in 2006 and was very incomplete, in part because it only addressed subsidies at the national level, but not the numerous subsidies offered by China’s provinces or municipalities. As U.S. Trade Representative Ron Kirk noted, “This lack of transparency severely constrains the ability of WTO Members to ensure that each government is playing by the rules.”<sup>164</sup> And some of these subsidies are contingent upon Chinese companies not buying imported supplies. For example, the central government provided subsidy grants of \$6.7 million and \$22.5 million to Chinese wind turbine manufacturers that agreed not to buy imported components.<sup>165</sup> Such subsidies are doing extensive damage to U.S. and foreign firms in not just the clean energy and but also many other industries. As Ben Santarris of SolarWorld, a German solar panel manufacturer, explains, “Pervasive and all-encompassing Chinese subsidies are decimating our industry.”<sup>166</sup>

It is common for Chinese companies to receive government subsidies. According to Caing statistics, over 90 percent of listed companies in 2010 were granted government subsidies.

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In 2010, a sample of these included 2.45 billion RMB (\$380 million) to Midea Electric Appliances; 1.56 billion RMB to CNPC (petrochemicals); 1.34 billion RMB to ZTE (information technology); 930 million RMB to Fengyuan Biochemistry; 700 million RMB to BOE Technology Group; and 580 million RMB to China Metallurgical.<sup>167</sup> And these subsidies help firms export. In a study of Chinese subsidies Grima et al. noted, “We find robust support for the hypothesis that production subsidies can play a role in increasing export volumes.”<sup>168</sup>

### Generous Export Financing

Most industrial nations provide some export financing. But China goes far beyond the norm. Indeed, China Ex-Im Bank, the state-owned export financing bank, provides nine times more export financing as a share of GDP than does the U.S. Ex-Im bank.<sup>169</sup> China’s Export and Credit Insurance Corporation (Sinasure) also provides massive subsidies for exports; underwriting close to \$100 billion in export credit insurance in 2009 at rates that meant it had to be subsidized by the government.<sup>170</sup> According to the Chinese government, “The China Import and Export Bank sets special fundraising accounts for providing fundraising support to the import and export of core technology and crucial equipment needed for the development of high-tech enterprises.”<sup>171</sup> The Bank reports, “With China’s Ex-Im Bank credit support, China First Heavy Industries has seen enhanced market competitiveness and facilitated its exports of complete sets of large equipment...to regions worldwide, including America.”<sup>172</sup> Ex-Im Bank provided the Aviation Industry Corporation of China with \$15 billion to help China’s aviation industry “achieve leaps and bounds development and seek further integration into the international aviation industry,” again with the intention of taking market share away from companies like Boeing. The issue is not so much that China is providing export financing, but rather its massive scale. As the U.S. Ex-Im Bank stated, “Most of the terms and conditions of their [China Ex-Im Bank’s] financing *did* not and *do* not fit within the OECD guidelines.”<sup>173</sup>

### Tax Incentives

It’s one thing for a country to implement tax incentives tied to some overall goal like innovation (e.g., an R&D tax credit). It’s quite another to target tax incentives to domestically owned firms. But this is what China does in providing significant tax rebates to domestic firms competing with multinational corporations. For example, the government provided targeted tax incentives to Chinese firms such as Kingdee International Software Group, which has become the biggest enterprise resource planning (ERP) software supplier to small and medium enterprises in the country.<sup>174</sup> China also uses other discriminatory tax policies to favor domestic firms. At the end of 2011, China exempted forty-nine electric and fuel cell cars from sales taxes; but no imported cars were eligible for the exemption.<sup>175</sup>

China also recently put in a place a very generous new tax incentive to spur innovation, focused on High/New Tech Enterprises. The HNTE incentive allows firms to pay a corporate tax rate between 0 percent and 12.5 percent instead of the regular 25 percent rate if they invest at least 3 percent to 6 percent of gross revenue on R&D (depending on firm size), have 60 percent of firm revenue from core IP (defined as inventions, utility model patents, software, copyrights, proprietary layout designs, and new plant varieties), have 30

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*Many American trade and economic policy experts refuse to acknowledge that Chinese economic policy is based on a fundamentally different conception than America's of economic welfare and of how to achieve it.*

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percent of their workforce with a college degree, or 10 percent employed in R&D or high-tech occupations.<sup>176</sup> However, China has structured the provision to favor Chinese-owned high-tech firms, as firms must have their core intellectual property owned in China or exclusively licensed to an entity in China. As the consulting firm Deloitte noted, “Overall, it appears that obtaining the HNTE status will be difficult for most China affiliates of MNCs.”<sup>177</sup> And to take advantage of this, “Foreign investors and multinational groups, having lost most tax preferences, have greater incentives to structure the role of a PRC affiliate to qualify for HNTE status and tax preferences, not only by conducting more R&D activities and owning more IP.”<sup>178</sup> Another legal analysis warned, “To qualify for HNTE status, which would allow them to enjoy a reduced tax rate, they must decide whether to convey their rights in the IP through technology assignments or licenses.”<sup>179</sup>

#### Land Grants and Rent Subsidies

Provincial and local governments often give export-oriented Chinese enterprises free land upon which to erect factories or offices.<sup>180</sup> These land grants are often larger than what's needed to build the facility so companies often build apartments or commercial buildings on the surplus land, and use the profits to pay for R&D and offset factory losses.<sup>181</sup>

### MAKING SENSE OF CHINESE MERCANTILISM

This documentation of Chinese mercantilist policies, while not comprehensive, provides a sense of the scope and magnitude of China's efforts, reflecting just how far out of step it is from the norms and values of the global trading system as established in the WTO. Yet it is difficult for many American economic and trade experts to fully grasp the implications of what China is doing. To these experts, economic policy is about enhancing consumer welfare by enabling markets to efficiently allocate goods and services in well-defined, legally protected markets. If it's cheaper to buy a product by importing it, they argue, economic welfare is maximized by importing it. If market forces tell a company it should go out of business because it can't make a profit, economic welfare is maximized by letting it go out of business, not by propping it up with subsidies. If an American establishment moves to China or goes out of business due to Chinese competition, regardless of whether mercantilist policies were a cause, this reflects the “wisdom of the market.” If the Chinese government is misguided enough to subsidize their exports, American consumers are the better off for it.

But this is not a universal view of trade and markets to which all parties subscribe. In fact, it is a view less deeply held in some continental European nations and is rejected out of hand by many Asian nations and especially by China.<sup>182</sup> But many American trade and economic policy experts refuse to acknowledge that Chinese economic policy is based on a fundamentally different conception than America's of economic welfare and of how to achieve it. Because of this, when they see what they believe to be market distorting, welfare-reducing behavior on the part of the Chinese government, they believe that China has not yet learned the merits of the superior and correct rules-based system. If only we work more energetically to educate the Chinese about “the benefits of free trade and free markets” the thinking goes, they will understand the error of their ways. But it is the American economics and trade community that needs to see the error in failing to acknowledge that not only is the Chinese economic system fundamentally incompatible with the economic

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systems of the founding General Agreement on Tariffs and Trade (GATT) nations, but that China has little interest in adopting the Washington consensus approach to trade and economic policy. It's not that they don't know the arguments embedded in the Washington consensus. They reject them in favor of the Beijing consensus.

While American and European and Commonwealth countries certainly engage in occasional disputes over trade and erect the occasional mercantilist policy, by and large they respect intellectual property rights, the rule of law, the primacy of markets in setting currency prices, the right of private investors in determining the location and nature of their investments, the need to ensure that public enterprises don't compete unfairly with private firms, and other free trade practices. When the GATT was signed in 1947, most of the twenty-three original signatories were either European or Commonwealth nations that embraced these values and played by the rules. And the notion was that as more nations signed onto the GATT (later to become the WTO) they too would think and act like the founders.

But that has not happened. China does not think and act like the WTO founders. As discussed above, Western nations see the global economic system as one in which nations seek comparative advantage while the Chinese see it as one in which they strive for absolute advantage. China's state planners systemically evaluate where China is dependent on imports and systemically seek to develop domestic capabilities to reduce those imports. But unlike the Latin American nations that practiced import substitution in the 1960s and 1970s, (which failed in part because their markets were too small), China is practicing both import substitution and export-led growth. For example, with regard to software China relies widely on software piracy in the short run and development of Chinese domestic alternatives in the long run that can be exported. Rather than continuing to import aircraft, China is pressuring Boeing and Airbus to transfer technology to China in exchange for market access so that the Commercial Aircraft Corporation of China (COMAC) can learn how to produce its own passenger jets for the Chinese and global markets. Rather than importing semiconductor chips, China is working to develop its own domestic industry to end dependence on foreign chips.

This is why some of the key targets of the central government's indigenous innovation catalogues were products that "are imported in high volume" and products that could "generate high foreign exchange earnings through export or with high potential for export."<sup>183</sup> Indeed, China's economic strategy is to:

Establish a coordination mechanism for introducing, digesting, absorbing and re-innovating technology. Organize a coordination institution headed by departments in charge of comprehensive economic management with the participation of science and technology, education, financial, commercial, taxation, the customs, quality inspection, IPR, and other departments concerned to formulate policies for introducing important industrial technology and equipment, and organize and supervise the digestion, absorption and re-innovation of introduced technology.<sup>184</sup>

But the \$64,000 question is this: if China doesn't want to import high value-added products (and want to export more of them) and also refuses to let its currency significantly

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*China's 12<sup>th</sup> Five Year Plan devotes no attention to raising the productivity of the nation's non-traded sectors, even though this promises the fastest path to growth.*

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appreciate so it can continue to maintain advantage in low-valued-added products, what does the country want to import? There is one other key component of the Chinese strategy that is important to understand. Like virtually every other nation, China rightly designed its economic policy to boost its standard of living. Many nations, especially Western ones, do this by putting in place policies to enable all industries to raise their productivity. The Chinese government, however, sees the path to prosperity through a shift from low value-added industries to high value-added products, services and technologies. This in fact was a key stated motivation behind the 2006 shift to indigenous innovation. According to Chinese thinking, it is not enough to be commodity producers; China feels it must produce innovation, which generates higher returns. This narrow view of how to achieve productivity growth drives much of China's economic strategy, and it is likely to ultimately be counterproductive, as discussed in more detail below. For example, it is striking that although the Chinese Communist Party Central Committee's *Proposal on Formulating the 12th Five-Year Program on National Economic and Social Development* states that "development remains the key to resolving all the problems in our country" it devotes no attention to raising the productivity of the nation's non-traded sectors, even though this promises the fastest path to growth.<sup>185</sup>

It's clear what China is trying to do: limit imports, drive exports, and shift output to high value-added and innovation-based industries. It's also clear how it intends to do this: institute a wide array of industrial and technology policies, the majority of which are mercantilist in nature. But it's less clear what the Chinese government's motivation is. Is China's drive to gain absolute advantage in all areas, include technology, to ensure it become a dominant military force which it can then use to replace the United States as the global hegemon?<sup>186</sup> Certainly this hypothesis should be taken seriously. Is it an emotional reaction to over 100 years of colonial rule when China was dependent on and exploited by the West and in their mind, shamed by the West?<sup>187</sup> In other words, to demonstrate that China is second to no one such that global players have to come to Beijing, not Washington. Is it an unwillingness to accept the "creative destruction" that goes with a more Western approach to economic development? In other words, embracing an across-the-board productivity strategy would require more enterprises to fail and some workers to lose their jobs. Or is it a belief in a flawed theory of growth that holds that that the path to prosperity is to shift their economy's industrial mix to a high-value-added one? Perhaps it is a combination of all of these factors.

Regardless, the result is an economic strategy that is at odds with the basic tenets of the global trading system as embodied in WTO principles and in the conduct of rule of law that most nations enshrine in their domestic systems and enforce them in ways that also protect the economic activity of foreigner operating there.<sup>188</sup> As such it is a strategy that has done and continues to do considerable damage to the U.S. and global economies.

## **CHINESE JUSTIFICATIONS FOR INNOVATION MERCANTILISM**

Chinese leaders are aware that other nations are scrutinizing and sometimes criticizing their individual mercantilist economic policies and their entire mercantilist model. To respond, they have developed highly sophisticated justifications for them, in part based on careful analysis of U.S. policies, practices and vulnerabilities. However, on examination none

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withstand scrutiny. Nevertheless, Western observers sometimes are too quick to accept these rationales. The following is a list of the most commonly offered justifications for Chinese mercantilism.

### **China May Engage in Some Mercantilist Practices but so Does the United States**

This is a frequently used catch-all justification and it has a number of different versions.

#### **Yes, We May Have Indigenous Innovation Product Catalogues, But You Have “Buy American” Provisions**

There are key differences, however. One is that the indigenous innovation product accreditation system would have treated foreign firms that didn't transfer technology to China differently from firms that would have been willing to do so. Also Article 9 of China draft Regulations Implementing the Government Procurement Law require Chinese government agencies to discriminate against foreign indigenous innovation products and give preferences to Chinese indigenous innovation products. China agreed at the 2011 Strategic and Economic Dialogue (S&ED) to eliminate this preference but has not yet published revised draft Regulations Implementing the Government Procurement Law that do so. Article 9 also requires domestic preferences for other purposes. No U.S. provision does this. In contrast, there are exceptions to the Buy American Law and regulations that allow U.S. agencies to buy basically anything at a store like Office Depot without regard to country of production or assembly. In contrast, Article 10 of 2003 China's Government Procurement Law contains a buy-China requirement. If the United States required purchases of U.S. original brands, as China did the 2009 product accreditation measure, then the U.S. State Department could never have purchased Lenovo computers.

Moreover, the Buy American provisions that were included in the United States' stimulus bill (the America Reinvestment and Recovery Act) were consistent with U.S. commitments made in the Government Procurement Agreement, exempting countries that have made reciprocal commitments from the Buy American clause. Moreover, the Buy American provisions in the ARRA impacted just a few billion dollars of U.S. imports, not the entire U.S. government procurement budget.<sup>189</sup> And, the Buy American provisions exempted IT products from coverage. In contrast, Chinese procurement restrictions apply to all levels of government and to most of the SOEs.

#### **Yes, We Limit Foreign Firm Participation in R&D Efforts, But So Do You**

While there have been some cases where foreign firms were not able to participate in U.S. R&D efforts, these are the exception rather than the rule. Chinese officials like to bring up the case where the Department of Energy program on semiconductors research excluded Dutch equipment supplier ASML. But in fact, to date the DOE loan program has made eight loan guarantees with a value of just under \$7.5 billion to projects that are run by companies that are wholly owned subsidiaries of foreign corporations.<sup>190</sup> Moreover, a U.S. flagship technology development program, SEMATECH, had twelve U.S. members and five non-US members.<sup>191</sup> Other programs like ARPA-E, NIST's ATP program, and NSF's Engineering Research Center program all allow participation of foreign firms if they have facilities in the United States.

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*China could grow just as rapidly by pursuing a robust domestic expansionary economy that drives growth through increased domestic consumption, business investment and/or government spending.*

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### Yes, We Require U.S. and Other Foreign Firms to Have JVs with Domestic Chinese Firms, But You Limit Chinese FDI Into the United States

China's complaint that the United States limits Chinese FDI is based in large part on the experience of the Chinese government-controlled CNOOC Ltd. when it tried to purchase oil company Unocal. CNOOC pulled out of the deal after considerable Congressional opposition. But it is important to note that in this case, while CNOOC could have purchased Unocal (at least in theory), Unocal could not have purchased CNOOC since the Chinese government prohibits foreign ownership of SOEs. Moreover, most China-backed deals are not covered by the Committee on Foreign Investment in the United States (CFIUS), and those that are receive formal and objective hearings.<sup>192</sup>

Moreover, the U.S. does not impose joint venture (JV) requirements and has very few industries in which foreign equity ownership is at all limited. Where these limitations exist, they can be found in the appendices to U.S. free trade agreements and bilateral investment treaties. China's limitations are not transparent, and in negotiations for example on bilateral investment treaties China has made some improvements but it has never been willing to accord national treatment to investors seeking to establish in China, and it has also never listed out its restrictions in a "negative list". This demonstrates that China does not wish to extend the WTO principle of national treatment to foreign investors, beyond commitments it made upon accession to the WTO, e.g., in specific commitments under the General Agreement on Trade in Services (GATS). In addition, China's new national security review regulation is actually much broader than CFIUS.<sup>193</sup> Moreover, many of these JVs require foreign firms to partner with Chinese state-owned enterprises, whose major decisions are controlled by the Central Committee of the Communist Party.

Finally, many of the Chinese investments overseas are backed by the government, whose goal is to acquire foreign technology firms and transfer their intellectual property back to China.

### Yes, Our Patent Office May Be Biased Against Foreign Firms, But Yours is Biased Against Chinese Firms

The claim that America's patent office is biased is without any merit whatsoever.

### China is Doing Nothing Different Than America Did When it Was at China's Stage of Development

Chinese officials are careful students of U.S. economic history and like to quote it back to U.S. officials. Chinese officials may mention that "Alexander Hamilton instituted infant industry tariffs to develop U.S. industries, without which, they suggest, the United States would not have become an industrial nation." They may also recount Charles Dickens' lawsuit in the mid-1800s over piracy of his books in America?"

Sometimes Chinese officials bring in a wider array of nations as when one official justified the chronic Chinese trade surpluses by stating: "Britain enjoyed a trade surplus for a century, America for fifty years, Germany for thirty years. It is now our turn." However, even at their most mercantilist, American policies never approached Chinese mercantilism in their extremity and extent. Also, the United States was not in the WTO (which did not exist) and had not made a binding commitment, as China has, to play by the rules. The

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United States also paid for its protectionist Smoot Hawley mistakes, and took action to establish the GATT system as soon as World War II ended. If China wishes to have the freedom the United States did in the 1800s it has an easy route: withdraw from the WTO and lose the benefits of membership. But as long as it wants those benefits, it needs to play by the rules. It can't have it both ways.

### China Needs the Jobs

Perhaps the leading justification (both in China and by Western defenders) for Chinese mercantilist practices is that the only way a nation as big as China can create sufficient numbers of jobs and maintain economic and political stability is through export-led policies to maintain massive trade surpluses. In other words, if China doesn't keep running big trade deficits and attracting FDI for export they will not be able to create enough jobs to employ the tens if not hundreds of millions of people migrating from the peasant countryside to the industrial cities. And if they can't employ these people the country will collapse into economic and political chaos, disrupting not just China but the world. So by all means, America should turn a blind eye to China's mercantilist policies lest Asia become unstable.

While appealing in simplicity, even some Chinese commentators are not persuaded. As one Chinese editorial commented, "The nation's current structural problems are nothing new, and there are even general agreements about solutions. What's worrying, though, is that an overemphasis on "maintaining stability" is putting a veneer on the status quo."<sup>194</sup>

Looking around the globe, there is ample evidence that growth and stability don't require mercantilism. For example, there is no correlation between a medium or large sized nation's balance of trade and its unemployment rate.<sup>195</sup> Nations with trade deficits are no more likely to have high unemployment rates than nations with trade surpluses. Academic studies point to the same conclusion. As one thorough review of the economic literature on trade and job creation showed, "In the long run, aggregate net employment largely is unaffected by international factors, whereas these factors have important allocative effects in the short and long run, both between and within detailed industries."<sup>196</sup> In other words, despite what policymakers in many nations believe, trade surpluses or deficits can change the mix of industries and firms, but they don't change the overall number of domestic jobs or rate of job growth over the medium and long-term. Likewise, a National Bureau of Economics Research paper concluded that "while exports have become increasingly important in stimulating employment in China...the same gains could be obtained from growth in domestic demand, especially for tradable goods."<sup>197</sup>

The logic underlying this goes back to the simple Macroeconomics 101 growth equation: a change in GDP equals the sum of the changes in consumer spending, government spending, corporate investment, and net exports (exports minus imports). [For those who remember their macroeconomics, this is the classic  $GDP = C + I + G + (Ex - Im)$  formula.] In other words, China could grow just as rapidly by pursuing a robust domestic expansionary economy that drives growth through increased domestic consumption, business investment and/or government spending. If countries have put the right macroeconomic conditions in place (e.g., a loose monetary policy, aggressive fiscal policy

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and a better social safety net so citizens aren't compelled to save most of their money for their future security), they don't need trade surpluses to create jobs. Low unemployment is the natural order of things over most of the business cycle. As more Chinese workers move from rural areas to urban areas, they should automatically be able to get jobs as long as China runs an expansionary domestic economic policy. This is because each new Chinese worker also automatically becomes a new Chinese consumer, creating demand to employ other workers. China's claim that manipulating the trading system to run up huge trade surpluses is the only way to employ the millions of Chinese citizens coming off the farm is incorrect.

Moreover, the notion that systematically running up huge trade surpluses is good for the Chinese economy is also not true. Running up large, sustained trade surpluses is actually bad for economies. In effect, the \$426 billion current account surplus China accumulated in 2008 did not really boost the nation's living standards, because that \$426 billion represents \$426 billion of value that China sent outside its borders without importing any value in return. China's residents are actually \$426 billion poorer due to this. In fact, if China didn't run these trade surpluses, Chinese households could see a 17 percent increase in their disposable income.<sup>198</sup> In aggregate, this is an enormous figure. China could produce a dramatic increase in its citizens' standards of living if it no longer ran a trade surplus, and instead spent its would-be surplus on imports of goods and services, instead of imports of Treasury bills. The principal reason nations should be exporting is to be able to afford imports because they need products or services that they can't produce themselves, or can't produce as well as others.

And what is China doing with its \$426 billion surplus? Would China get the best return by investing in capital equipment to expand domestic production, or by investing in U.S. T-bills, as it does? Clearly, China would be better off if it took its \$426 billion surplus and invested it back into its economy rather than loan it back to the United States so that the United States can continue to consume more than it produces. The notion that an economy with a per-capita income less than one-sixth the U.S. level should sacrifice \$426 billion a year in loans to America is questionable, including from a domestic political economy point of view. But by loaning it to the United States it can keep the value of its currency low.

China should use its surplus to buy more capital equipment goods—more tractors, medical equipment, jet airplanes, electric generation stations, machine tools, telecom equipment, computers, software etc.—from the rest of the world to build its economy. In effect, China can do three things with its surplus: consume it (e.g., buy consumer goods or services, such as shoes); invest it (buy capital goods such as computers and machines); or do the equivalent of putting it in a low-yield bank account (e.g. buy dollars). It's understandable why Chinese leaders don't want to buy more shoes, because China wants to build its economy and to build an economy countries need to invest. But expanding Chinese consumption, including improving its aging and underdeveloped health care system, would have important benefits for Chinese citizens. Moreover, China should be investing substantially more in capital goods, and importing them without the array of domestic content, localization policies, and technology transfer requirements it currently imposes.

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While some may point out that China is already investing in capital goods, that's true. The point, however, is that it could and should be investing much more.

### **China Needs to Run Trade Surpluses to Maintain Adequate Foreign Currency Reserves**

One of the justifications long used by mercantilists is that they need to limit imports in order to accumulate adequate foreign reserves to buy needed capital goods imports and to control for “hot money” outflows. Many nations have used this rationale, including after the Asian financial crisis in the late 1990s. And perhaps in some cases, as for small nations over particular periods of time, there is some rationale for it. But in China's case this does not make sense. It has the largest amount of foreign reserves of any nation at any time in history—far more than it could ever need to manage a sudden outflow of capital—yet it continues to run up trade surpluses instead of spending its surplus to buy goods and services from abroad.

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*China's claim that manipulating the trading system to run up huge trade surpluses is the only way to employ the millions of Chinese citizens coming off the farm is incorrect.*

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### **China Would Not Run a Trade Deficit With the United States if it Ended its Export Controls on High-Tech Products**

China officials frequently raise U.S. export controls as an issue even though they affect less than one percent of U.S. exports. As one official stated, “Innovation requires exchange and sharing. We can only innovate if we learn from each other, and the only way we can do this is for you (the United States) to end your export controls.” Another official stated, “When China sends over its wish list (of imports) to the United States, that list is discounted and rejected.”

But while U.S. export controls are arguably slightly too restrictive (some U.S. high-tech products now on the control list should be available to China), the notion that China would be willing to buy \$200 to \$300 billion worth of additional products per year if they were not controlled is a dubious one at best. However, one set of items China could buy from the United States that are not controlled is IP-based products and services (e.g., prescription drugs, movies, software, video games, etc.). Yet, as noted above, China persists in turning a blind eye to rampant theft of intellectual property, including software, movies, music, books and other creative material. So, China actually does import more goods than is recorded, it just doesn't pay for them.

### **Indigenous Innovation is Key to Raising Standards of Living**

As noted, creating jobs and maintaining social order is the justification China gives for its focus on export-led growth supported by mercantilist policies. Chinese officials provide a different but related set of justifications for why they have switched to a focus on indigenous innovation. As they tell it, their major goal is to catch up with developed nations; hence GDP growth is targeted as the key priority. This is logical. The top economic priority for developing nations (and in fact for all nations), should be GDP growth. After all, the definition of a developing nation is that its standard of living is much lower than that of developed nations.

But Chinese officials argue that their country can get richer only by switching from low-value-added industries and/or activities to higher value-added ones; and that this has to be

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done through indigenous innovation. As one Chinese official explained, over the last two decades China attracted FDI, accumulated skills and gradually moved up the value chain. These were huge successes. But Chinese companies didn't want to invest and develop new products on their own since this was much more risky. It was easier for them get contracts from multinational firms and be commodity suppliers to original equipment manufacturers (OEMs). As a result, he continued, Chinese officials worry that China is on a path that would lock them into low-wage commodity production. Another official justified indigenous innovation by stating, "Since so much of the value of products is in the IPR, as compared to commodity production era, China can get rich only by developing its own IPR." However, as discussed below, the Chinese do not need indigenous innovation to get rich.

A related argument is China's complaint that it gets very little of the value of final products produced in the country, with Western companies/nations getting the lion's share. Thus, their claim that China is justified in using mercantilism to go up the value chain and avoid being stuck as a low-wage assembler. But of course China gets less value than it might from its export production because the very centerpiece of its economic strategy is to export value. That's how it is able to attract investment and run large trade surpluses. China provides massive export subsidies through currency manipulation, land giveaways, tax holidays, subsidies, limitations on wages, and other practices in order to sell exports at a discount. As a result, it gets much less for these exports than it otherwise would. In short, the Chinese government deliberately passes much of the value of the country's production onto foreign consumers at the expense of Chinese workers.

### **Indigenous Innovation is Needed to Reduce Dependency on Exports**

Some of the justifications for indigenous innovation contradict others. Government officials argue that China has adopted indigenous innovation because "China is too dependent on exports for generating growth." Somehow the view is that more innovation domestically will buttress the country's supposedly balanced growth strategy. But in fact, China's indigenous innovation is targeted precisely at reducing imports of technology-based products and the payments of royalties for intellectual property. If anything, indigenous innovation will increase, not decrease, Chinese exports.

### **Indigenous Innovation is Needed to Deal With High Labor Costs**

One government official stated that "China needs indigenous innovation because of our increase in labor costs." In other words, because of increases in labor costs, China won't be able to be competitive in commodity manufacturing and will need to be a high-tech producer. To start with, even after recent increases Chinese manufacturing labor costs are just 5 percent of U.S. manufacturing labor costs, so they have a long, long way to go before labor costs become a problem.<sup>199</sup> Moreover, increased labor costs will help, not hurt, their economy. First, they will lead to a smaller trade surplus and higher real incomes for Chinese workers which will spur the development of domestic serving industries. Second, they will put greater pressure on Chinese firms to boost productivity. This, in turn, will boost wages without increasing production costs.

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## Indigenous Innovation is Needed to Deal With a Declining Working-Age Population

Another justification for indigenous innovation is that because of China's one child policy, China's working age population will shrink in the future and China won't have enough workers to keep expanding factories. But China's "demographic dividend" is expected to continue to expand for another two decades.<sup>200</sup> Moreover, this rationale flies in the face of the claim that China needs the jobs. If what Chinese leaders are really saying is that in twenty years China will have a higher dependency ratio and therefore needs a higher national income, then as described before, the best way to get that is not indigenous innovation, but through an economy-wide productivity strategy.

## Indigenous Innovation is Needed to Address Environmental Challenges, Including Global Warming

Another common refrain, expressed especially to Western officials concerned with global warming, is that China's industrial economy is incredibly polluting and that by shedding cost-sensitive heavy industry and shifting to higher value-added innovation industries China's economy can become cleaner. One official argued in favor of China's strategic and emerging industries development plan on the basis of the need to reduce energy and natural resources use.

But such a claim does not hold up to scrutiny. If China were to import all its steel, chemicals, cement and other energy-intensive products instead of producing them, they would likely do so from other Asian nations even farther back on the development scale (such as India, Vietnam, and Cambodia). And the total level of global GHG emissions from such a transition would actually be higher, not lower, since overall demand for these products would go up and they would still be produced with high carbon emissions. The total number of workers exposed to harmful pollutants would be the same or greater. If China were truly serious about reducing the environmental impact of its industries it would enact meaningful pollution control regulations and import large amounts of significantly cleaner factory technology and clean energy technology from developed nations. But this would raise production costs in China and require more imports, neither of which the Chinese government wants.

## Indigenous Innovation is Needed to Deal With Social Imbalances

Another argument Chinese officials make for indigenous innovation is that it will help with imbalances of social development. One official argued that parts of China (especially in the West) are more akin to poor parts of Africa in terms of development and so China needs indigenous innovation to ensure "balanced growth." But if anything, high-tech development leads to greater regional imbalances as high-tech jobs tend to be concentrated in urban clusters near populations of well-educated people.<sup>201</sup> Moreover, if it is truly focused on interior development, China could use an even greater significant portion of its current account surplus to support capital improvements, including infrastructure in the interior.

A related justification offered is that the Chinese development model has provided very little for consumers. One Chinese official cited statistics that in 2000, consumption as a

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*China gets less value than they could from its export production because the very centerpiece of their economic strategy is to export value.*

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share of GDP was 62 percent but by 2009, it had fallen to 47 percent. He went on to complain that during this time income distribution became less equitable so that the average citizen benefited very little from economic developments. This is in fact a very good argument for why China should end its export-led model. But no explanation is offered as to why shifting to an indigenous innovation strategy would reduce income inequality or boost consumption. As noted above, one key way to boost consumption would be to stop running trade surpluses and use much of the \$3 trillion in foreign exchange to buy goods and services for Chinese consumers.

### **Indigenous Innovation is Needed Because China Receives Such Low Returns on its Foreign Investments**

Still another justification offered for the shift to indigenous innovation is that China receives very low rates of interest on its massive holdings of foreign exchange. This is akin to someone saying they need to get a new job that pays more because they put all their money in a mutual fund that keeps losing money. The easy answer to China's low rates of return on foreign investment is to stop buying U.S. T-bills that pay around 3 percent and instead use the money to buy imported high-tech capital equipment that would provide much higher returns.

### **Don't Blame China: It is Poor and Dependent**

China will defend its policies on the grounds that as a poor developing nation it should be allowed to bend the rules in order to lift hundreds of millions out of poverty. Officials will sometimes make statements such as, "China needs to do indigenous innovation and have exemptions from the any Government Procurement Act we sign because we have hundreds of millions of people in as abject a condition as people in poor African villages." Moreover, they argue, developed nations have inherent advantages and the rules of the WTO are biased against developing nations.

But it is a perverse view of fairness to argue that being able to sell to developed nations that have high labor and environment standards and higher wages is not an advantage; and that being forced to pay for IP is a disadvantage. Combine this with the all too unpleasant history of colonial domination and it's easy for some Westerners to say, given our history, we have no moral claim for asserting that China should play by the rules.

A case in point was a 2009 meeting in London at 10 Downing Street on the issue of innovation and China. After making a presentation on the need for Britain to take more aggressive steps to confront Chinese mercantilism, a top advisor to the European Commission on innovation asserted that I was a "racist" for arguing that the dominant logic of Chinese economic policy is mercantilist. My European detractor even went so far as to state, "We [meaning the Europeans] oppressed China for a hundred years as colonialists and now we have to sit there and take it for a hundred years." Former Ambassador to China and longtime China hand James Lilly once wrote, "The American guilt complex over wrongs done to China is often played upon by the Chinese. 'We are weak,' they say. You have caused this, so you owe us. Give us something.' I never bought this."<sup>202</sup>

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*As China scholar Dieter Ernst argues, “China’s evolving standards system provides little evidence that convergence to the American system is likely to materialize.”*

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## Intellectual Property is a Form of Western Imperialism

China, like many developing nations, frequently asserts that intellectual property controls are a form of Western imperialism designed to keep them poor. One Chinese official complained that they have to pay too much for foreign intellectual property and that this is a legitimate reason for the move to dramatically increase the number of created-in-China technologies. As Dan Breznitz states, Chinese officials and corporate leaders “agree that Chinese companies should not have to pay for the right to use a technology that every economic actor is required to use.”<sup>203</sup> But this misses three points. First, China has almost \$3 trillion in foreign exchange earnings from chronic trade surpluses that it could use to purchase foreign IP. Because of its stage of development, China’s economy specializes in cost-based production. Because of their stage of development, Europe, Japan and the United States specialize in innovation and IP-based production. By refusing to pay for IP, the Chinese are refusing to cede competitive advantage in anything. Second, if China doesn’t want to import IP, what does it want to buy from developed nations? After all, Western nations like the United States have invested trillions of dollars to develop IP. (The answer of course, is that they want to buy very little). Third, if it let the renminbi rise, the amount they would pay for foreign IP would decline since imports would be cheaper.

## Give China Time: It is Still Learning to be a Market-Oriented Economy

Related to the “poor and dependent” rationale is the claim that China is still a developing country on a learning curve, and trying to make things better. Just give us time, they ask. As one official stated, “There are still some loopholes in IP laws, but it’s not due to lack of trying. We are still learning.”

But it’s not really a question of learning. There are a multitude of institutions, including the World Bank and the U.S. government, that spend considerable time and effort helping Chinese officials to learn the Washington consensus approach to development. While it is true that many nations do learn and improve their economic development policies as they develop economically, China has actually become more interventionist in the last five years, not less. As China scholar Dieter Ernst argues, “China’s evolving standards system provides little evidence that convergence to the American system is likely to materialize.”<sup>204</sup> Chinese economists and other scholars study Western economics and policy journals and development policies. Chinese officials know how to make China a market-oriented, rather than mercantilist, economy; they just do not want China to be one.

## China Can Help the U.S. Economy by Investing its Massive Current Account Surpluses in the United States

This is the newest argument Chinese officials make and one that is likely to be prevalent over the next several years. The argument goes like this: “America’s economy is struggling. You need more investment. We can help you. We can rebuild your infrastructure. We can inject foreign direct investment into America if you let us buy your companies.” This is an argument that many in the U.S. trade community make as well.<sup>205</sup>

But what this overlooks is that there is virtually no difference to U.S. economic competitiveness if China recycles its foreign exchange earnings to the United States by buying T-bills, toll roads, or technology companies. In fact, it could be worse if they buy

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actual companies for they are likely to use the purchases to cart up all the intellectual property in the company and move it lock, stock and barrel to China. To be clear, when the United States is running massive trade deficits, the best thing China can do with its massive surpluses is to buy American goods and services, not American companies. To the extent Chinese FDI can help restore American competitiveness it is in the building of greenfield facilities where a significant share of output is sold around the world or substitutes for imports. If China wants to use its massive capital investments to build factories, software companies, R&D labs or other traded sector activities in America it should be welcomed with open arms. But if it is buying U.S. companies as a way to earn higher returns on their structured trade surpluses and to ship U.S. technology and know-how back to China it should not be encouraged.

### **The United States' Weak Economy is its Own Fault, Not China's**

When defending structural trade imbalances, Chinese officials will try to turn the tables and blame America, claiming that fiscal irresponsibility and lack of financial regulation have caused the U.S. trade deficit. After all, they argue, it was American greed and lack of financial regulations that caused the global financial crisis. Chinese officials will contend, “You don’t manage your economy well enough and need to save more and be less dependent on China buying your bonds.” The *People’s Daily* recently called the U.S. handling of the debt crisis “irresponsible and immoral.”<sup>206</sup> Or as Liu Weimin, a spokesman for the Chinese Foreign Ministry, said, “We think that that sort of frequently blaming others, looking for scapegoats and even misleading the public, is an irresponsible attitude.”<sup>207</sup>

To be sure, the lack of regulation over the financial sector was a U.S. failure. Moreover, the lack of robust innovation and competitiveness policies in the United States makes it less competitive and contributes to the trade deficit and loss of jobs. But this does not in any way absolve China from responsibility for the harm its mercantilist policies have caused. Criticizing another nation’s mercantilist policies is not “looking for scapegoats.” Moreover, the United States in fact is not dependent on China buying its bonds. If China stopped buying our bonds, the value of the RMB would rise and the U.S. trade deficit would fall, creating millions of American jobs, expanding the economy and reducing the very need to buy Chinese bonds. And while U.S. interest rates would go up, this in all likelihood would be a good thing as it would spur increased savings by Americans, long a goal of U.S. policymakers.

### **China Isn’t Mercantilist**

When push comes to shove, Chinese officials will deny that they are engaged in mercantilist practices. When pressed about forced technology transfer the response will be that they don’t force technology transfer. But when U.S. companies are “made an offer they cannot refuse” vis-à-vis tech transfer, there is a defacto if not legal requirement to comply. When asked about indigenous innovation, Chinese officials will claim that this is a translation problem and that the proper English language interpretation is simply “innovation.” Yet, any reading of a Chinese government document on innovation in the last five years will make clear the fallacy of this statement.

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## If the United States Pressures China, It Will Become Protectionist

Anytime anyone in the United States suggests that the United States should push back against Chinese mercantilism the Chinese response is the United States shouldn't resort to protectionism. Knowing exactly the right notes to play, Premier Wen Jiabao, as quoted in an advertising supplement to the *Washington Post* placed by *China Daily*, stated, "Trade protectionism can slow down global economic recovery, damaging the welfare of consumers around the world."<sup>208</sup> China knows that playing the "protectionist card" will get attention because of America's long standing commitment to free trade. But any nation that is running a trade deficit of 4 percent to 5 percent of GDP is by definition not protectionist, it is "passivist" and as discussed below, taking action to stop being hurt by another nation's mercantilism is anything but protectionist.

## The United States Has No Right to Interfere in Internal Chinese Matters

Finally, when truly pressed, Chinese leaders will fall back on the argument that theirs is a sovereign nation that won't be told what to do. We see this most often with Chinese officials responses to pressure to raise its undervalued currency. They argue that this is purely a domestic policy concern.<sup>209</sup> But, of course, it's not. The entire *raison d'être* for the WTO and other global organizations setting rules of the road for global trade is the recognition that actions which nations take internally can have significant negative implications on the global economy. If a nation is in the WTO and wants the benefits of it and other multilateral agreements, it shouldn't act to the extent China does in its unilateral interests.

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*China knows that playing the "protectionist card" will get attention because of America's long standing commitment to free trade.*

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## IS INDIGENOUS INNOVATION THE RIGHT STRATEGY FOR CHINA?

There are two major questions that need to be answered about China's innovation strategy. The first is, is it fair and good for the world? The answer to that is a resounding no on both counts. Chinese mercantilist practices such as discrimination against foreign firms and intellectual property theft violate any sense of fairness. And by distorting markets they are bad for the global economy. For example, the massive subsidies, including currency manipulation, to keep production cheap, artificially reduce the cost of Chinese labor and move the world production system more towards labor and away from capital. In other words, mercantilist practices reduce global productivity by causing the global production system to use relatively fewer machines. The Boston Consulting Group (BCG), in an analysis of low wage competition from China and India describes it this way:

In the developed world, most industries have invested heavily in automation and have also simplified product design in order to reduce labor content. In LCCs, where high labor content is less costly than high automation, the tradeoff between capital and labor is radically altered... Product design and manufacturing processes will need to be adjusted accordingly; screws may once again be cheaper than welds, and built-up assemblies may become cheaper than more complex integral designs.<sup>210</sup>

BCG went on to describe how one Western company eliminated all conveyer belts in its Chinese factories. It's one thing if this process happens naturally in an un-manipulated marketplace when more labor comes onto the global marketplace. But to artificially

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exacerbate this trend through currency manipulation and large subsidies reduces global productivity.

Moreover, the theft of intellectual property (including by cyber espionage) and forced technology transfer reduces the revenues going to foreign innovators, making it harder for them to reinvest in R&D and produce innovation for the global economy. Likewise, the manipulation of standards balkanizes global markets, keeping them smaller than they otherwise would be, thereby raising global production costs by reducing scale economies. The subsidies and protection to SOEs also mean that more efficient firms' global market share is lower, and costs higher.

But the second question may seem odd: is mercantilism good for China? If it weren't in China's interest, why would it be engaged in it after all? To understand why the Chinese mercantilist model is a flawed one for boosting productivity and per-capita income, it's important to understand that economies—whether national, state, or regional—have three ways to grow over the medium and longer term: growth in population, shift to high-productivity industries, and productivity growth across all industries.

In the first path, countries can get bigger by increasing their population, and hence number of employed workers. But this is not a sustainable strategy for many nations, particularly given threats to the global ecosystem. Moreover, the “get big” strategy does not boost per-capita incomes; it just leads to larger populations sharing a larger GDP.

The second two paths involve boosting productivity, which is the source of per-capita income growth. Productivity growth—the increase in the amount of output produced by workers per a given unit of effort—is the most important measure and determinant of economic performance for a nation. For instance, if U.S. productivity were to grow just one percentage point faster for the next forty years than it did during the 1980s, the average American would earn \$41,000 more per year than he or she would have otherwise (in real 2006 dollars).<sup>211</sup>

Economies can increase their productivity in two ways. First, firms can become more productive, usually by investing in new technologies or improving the skills of their workers. This is called the “growth effect,” where a nation's productivity goes up not by some sectors getting bigger or smaller, but by all sectors becoming more productive. For example, an economy's retail, banking, health care, and automobile manufacturing sectors can all increase their productivity.

Sometimes this happens as highly productive firms gain market share from less productive firms in the same industry. For example, as highly productive retail firms like Wal-Mart and Home Depot took market share from less productive firms (which usually have higher prices), overall productivity in the U.S. retail sector grew. In fact, Wal-Mart was directly and indirectly responsible for 14 percent of the jump in U.S. productivity growth from 1987 to 1999.<sup>212</sup> In other cases, productivity through the growth effect happens when a wide array of firms in a wide array of industries become more productive.

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*Given that China is the world's second largest economy, the best strategy for it is to focus on raising productivity across the board, as opposed to shifting to high value added industries through programs like "indigenous innovation."*

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The other way to increase productivity—called the “shift (or mix) effect”—is for low-productivity industries (as opposed to firms) to produce a smaller share of GDP and for high-productivity industries to produce a larger share. For example, if a developing nation loses fifty agricultural jobs (which in developing nations normally have low productivity) and replaces them with fifty jobs in the software industry (which normally has high productivity), overall productivity would increase, even if the productivity of the software firm adding the workers did not.

But which productivity strategy is the best path to higher productivity and per capita incomes: the growth or mix effect? The answer depends in part on the size of the economy and in part on the type of sector. The larger the economy, the more important the growth effect is, while the smaller the economy, the more important the shift effect is. Moreover, the more local-serving the sector is, the more important the growth effect is. To understand why, consider an automobile factory in a small city. If its managers install a new computer-aided manufacturing system and raise the plant’s productivity (the growth effect), a large share of the benefits will flow to the firm’s customers around the nation and to consumers in other nations who buy the car at lower prices. In the short run, the city will benefit only to the extent that its residents buy cheaper cars from that factory or if some of the increases in productivity go to higher wages (or more jobs) if the company expands market share instead of only to lower prices.<sup>213</sup>

In contrast, if the city attracts another auto plant where the wages average eighteen dollars per hour to replace a textile firm (with average wages of twelve dollars per hour) that moved overseas to a low-wage nation (the shift effect), most of the benefits will accrue to local residents in the form of higher wages for the workers who move from the textile plant to the car factory (and from more spending at local-serving businesses like restaurants, dry cleaners, furniture stores, etc.).

This means that across-the-board productivity growth, rather than a shift to higher value-added sectors, will be relatively more important for larger economies, including virtually all nations, because their consumers will capture a greater share of the productivity gains. And given that China is the world’s second largest economy, the best strategy for it is to focus on raising productivity across the board, as opposed to shifting to high value added industries through programs like “indigenous innovation.”

Yet, even for small countries, across-the-board productivity gains remain a vitally important way to become richer, especially if such gains come in domestic-serving industries (e.g., local banks, firms in industries like retail, banking, health care and government). The reason is that the benefits of raising productivity in domestic-serving industries accrue almost entirely to local residents in the form of lower prices for products and services. For example, if a city encourages its electric utility to install a smart electric grid system that boosts the utility’s productivity, most of the benefits, in the form of lower prices (and higher-quality electric services), will flow to local residents.

Thus, the lion’s share of productivity growth in most nations—and especially large- and medium-sized ones—comes not from changing the sectoral mix to higher-productivity industries, but from all firms and organizations, even low-productivity ones, boosting their

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productivity. Overall, the evidence shows that it is changes in organizations (e.g. businesses, government, non-profits, etc.) that drive productivity, with around 80 percent of productivity growth coming from organizations improving their own productivity and only about 20 percent coming from more productive organizations replacing less productive ones.<sup>214</sup> Similarly, Michael Porter found in his analysis of traded clusters in sub-state regions that raising the productivity of all clusters has about the same effect on income as shifting to higher productivity clusters.<sup>215</sup>

Recent research from the McKinsey Global Institute reinforces this finding. McKinsey's 2010 report, *How to Compete and Grow: A Sector Guide to Policy*, clarifies that countries that outperform their peers do not have a more favorable sector mix, but instead have individual sectors that are more competitive and productive. As the McKinsey report states:

Some observers believe that countries can outperform their peers because they have a mix of sectors that have a more favorable growth momentum. But the mix of sectors does not explain differences in the growth performance of countries with similar levels of income at all. The mix of sectors is surprisingly similar across countries at broadly equivalent stages of economic development. It is not the mix of sectors that decides the growth in developed economies, but rather the actual performance within the sectors compared with their counterparts in peer economies.<sup>216</sup>

In other words, it's not share that matters; it's productivity growth in all sectors. Put succinctly, the productivity of a nation's sectors matters more than its mix of sectors. McKinsey reached these conclusions by calculating the "growth momentum" of six leading developed nations: France, Germany, Japan, South Korea, the United Kingdom, and the United States. The growth momentum calculation takes each country's existing sectoral composition (e.g. the actual share of manufacturing, retail, construction, transportation, agriculture, and etc. sectors in each country) and predicts how much that country would have increased its value-added if its sectors grew at the average growth rate of all countries' comparable sectors. It turns out that the growth rate predicted by a country's initial sectoral mix falls into a small band for highly developed countries, from 1.8 percent to 2.3 percent, but that actual growth rates exhibited a much wider spread, from 0.4 percent in Japan to 3.3 percent in the United States, indicating that some countries' sectors are substantially outperforming other countries' sectors. In other words, the comparatively greater productivity performance of U.S. sectors contributed to a U.S. compound annual growth rate between 1995 and 2005 that was 0.9 percent larger than would otherwise have been expected, while Japan's comparatively lower productivity performance growth over that time period led to a compound annual growth rate that was 1.7 percent less than would have been expected.

But these findings apply not just to the developed world; similar results held when applied to a basket of six developing countries—China, India, Mexico, Russia, Brazil, and South Africa. McKinsey found that compound annual growth rates from 1995 to 2005 ranged from 3.5 percent in Brazil, to 5.5 percent in India, to 9.1 percent in China. These actual growth rates differ from the "growth momentum" predicted by these countries' initial

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sectoral mixes in 1995. That is, if each country's sectors had grown at the average growth rate of the six countries' respective sectors, Brazil's economy would have been expected to grow by 5.9 percent, India's by 5.2 percent, and China's by 5.7 percent. Thus, the variation from this prediction in the actual performance of these countries with their given sector mixes—from positive 3.4 percent in the case of China to negative 2.5 percent for Brazil—explains overall differences in growth. As McKinsey concludes, “This demonstrates the fact that, even if they started with a less favorable sector mix, the fastest-growing countries outperformed their peers in terms of their sector competitiveness.”<sup>217</sup>

In other words, small countries, such as Uruguay or Singapore, have to both import more and to export more. Thus, smaller countries legitimately have to pay more attention to the health of their traded sectors, and a higher wage traded sector gives them more of an advantage. But as countries get larger, the ratio of the size of their traded vs. non-traded production decreases; their economies shift much more toward the non-traded production. Therefore, as the second-largest economy in the world, China's path to prosperity will come from focusing on boosting the productivity growth of all sectors, especially its non-traded sectors.

Therefore the notion that the principal way China can get rich is through gaining global market share in high-tech industries is not accurate. Yet, Chinese government officials appear to believe that their best path to prosperity is by shifting their industry mix toward higher-value-added, innovation-based sectors. But the amount of productivity growth generated this way is quite limited. Consider that the Chinese government set a goal for the value-added of “strategic” emerging industries to reach 15 percent of overall GDP by 2020. Conservatively assuming that these industries now account for around 4 percent of GDP, and generously assuming that value-added per worker is twice as high in these industries as in the Chinese economy overall, this shift would yield a one-time productivity boost of just 14 percent. Assuming that the overall rate of Chinese economic growth will be 8 percent annually, this strategy of promoting strategic emerging industries, the centerpiece of Chinese economic policy, at best will generate the equivalent of 14 months of Chinese economic growth. This assumes that there is no cost to the Chinese policy, which of course there is.

But there is a second reason why indigenous innovation may not be optimal for China: China may be trying to be too innovative. How, one might ask, how can any country be too innovative? Isn't innovation good for all countries? It is, but that doesn't mean that the same kind of innovation is equally good for all nations. No matter how much an underdeveloped country like Zaire might want to be good at biotechnology, if it tries to be good at it, it will likely fail and in the process waste large amounts of money. Just as regions within the United States need to specialize in the type and phase of innovation in which they have a comparative advantage or can easily develop one (Wyoming is not going to develop a Silicon Valley), so too do countries need to specialize. A part of specialization is understanding innovation. The share of the Chinese workforce with the capabilities to excel in advanced technology innovation (highly skilled and creative STEM workers, venture capitalists, skilled technology managers, etc.) is much smaller than in the United

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States. The overall numbers might be close, but that is only because China has four times the U.S. population. We see even larger discrepancies in the per-capita filing of triadic patents.<sup>218</sup>

Yet, rather than focus on what the Chinese system is already good at and work to gradually move up the value and innovation scale, the Chinese government wants to artificially propel the nation to two or three levels ahead. The risk is that the innovation system isn't ready and that large amounts of money will be wasted. Under normal economic forces supplemented by non-mercantilist innovation policies, the Chinese economy would work its way up to becoming more innovative over a number of years if not decades, rather than attempt a "great innovation leap forward." As Chinese technology policy expert Dan Breznitz put it, "By focusing so much on producing novel-product innovation by any means possible, the central government might harm the pillars of China's sustained economic growth."<sup>219</sup> As Breznitz rightly argues, China should focus on process innovation (and as I would argue, productivity in the non-traded sector) so that it can afford to raise real wages and incomes.

Indeed, some Chinese government officials recognize the limitations of the Chinese innovation system. As one stated, "Leading-edge Chinese companies don't do forward-looking basic research. Relationships between universities/research institutes and industry are not very close." Another hoped that "Chinese companies will play a stronger role in innovation and commercialization." But China's government may be forcing innovation before the firms, managers, and entrepreneurs are ready. As one official bluntly admitted, "The Chinese innovation system is not very good." At a structural level, a key challenge for the Chinese innovation system is that the Chinese economy is dominated by three kinds of firms: the foreign multinational original equipment manufacturers (OEMs); the hundreds of thousands of commodity, low-margin manufacturers, largely producing for OEMs and propped up by an array of subsidies and protections; and a significant number of big Chinese SOEs, again propped up by subsidies and limited in their ability to innovate, much less to fire or lay-off workers. The dominance of subsidized SOEs (and the reluctance on the part of the government to accept "creative destruction") means that the space for disruptive, entrepreneurial innovators is more limited. As a result, this part of the economy—independent, innovation-based firms—is much less developed. As Kaidong Feng argues in his doctoral dissertation on Chinese indigenous innovation, Chinese type A firms (SOEs and joint venture firms) are actually much less innovative than Type B firms (independent firms). He writes, "The indigenous advance of technological capability building has actually been led by some new entrants. Their development has been independent of the advocacy of (the Chinese government.)"<sup>220</sup>

One government official concurred, stating:

The government-led model has a downside; it favors large projects which includes SOEs over smaller more entrepreneurial projects. These kinds of choices remain even during the new innovation growth phase. We want to identify large flagship enterprises to be the model for innovation. Moreover, the role played by small and medium-sized is seriously undervalued and they are facing severe problems in market access and

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financing. There are not enough linkages between universities/research institutes and firms. They have a lot of research outputs but they remain on paper and are not transferred.

But rather than listen to this feedback and respond with an appropriate strategy of gradually helping Chinese companies to build up management capabilities and abilities to adopt and refine technologies (all the while using the global trading system to buy the advanced technology products and services it needs), China's strategy is to artificially induce a high-tech economy. And that can have costly outcomes. As one official explained, Chinese tech strategies have resulted in a lot of "tragedies" (what he meant was costly mistakes). He went on to note that the Chinese government pressured Chinese firms to specialize in the production of CRT technology but when the technology moved to digital flat screen, China suffered sharply. He listed several other costly "tragedies" including a push into the development of chemical film and cameras just as digital cameras were emerging and, a push for VCR players just as DVD players were developing.

The recent and true tragedy of the Chinese high-speed rail system called sharply into question the rush to develop indigenous technology. Rather than buy a foreign-made high speed rail system, the Chinese government insisted on building its own system (with technology that was transferred under pressure from foreign providers), and it appears that they lacked either the management or technical skills to build one up to international safety and performance standards.

Finally, the national drive to be a technology leader is hampered by significant internal contradictions. The first is that while the Chinese government seeks to develop an innovation-based high end of the economy, it continues to protect the subsidies and systems that enable them to prosper in the commodity-based low end. In particular, the policies of currency manipulation gives Chinese companies less incentive to innovate, including developing products that are less cost sensitive and boosting productivity. When you are not under serious cost pressure, you can afford to relax. And the large system of state-owned enterprises means that the market space for more entrepreneurial, dynamic companies is limited, especially when they are competing against SOE's that enjoy sizeable government subsidies and regulatory favoritism. As one Chinese official stated, "Some industry sectors have an administrative monopoly. And as a result, they have little incentive to do innovation." He went on to state, "The government-led model has a downside—it favors large projects which includes SOEs, over smaller more entrepreneurial projects." These kinds of choices remain even during the new indigenous innovation growth phase. China's leaders want large flagship enterprises as the model for innovation. As a result, the role SMEs play in the Chinese economy is seriously undervalued and these entities are facing severe problems in market access and financing.

There is a second and growing contradiction. On the one hand, China wants to continue and even ramp up its mercantilism practices and policies in the service of its new indigenous innovation policies. But at the same time they are pushing a new "going out" policy, which seeks to encourage Chinese firms to become multinational with global reach and global brands. But these two goals conflict. As independent Chinese firms like

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telecommunications and IT equipment provider Huawei seek to become the truly global players, they are being held back by the fact that they are Chinese and rightly or wrongly associated with unfair Chinese government practices. Foreign nations will be more reluctant to let Chinese firms gain market share when they see that their own firms are explicitly being held back by Chinese mercantilist policies. It will be more difficult over the next decade for Chinese firms to take the leap from being national firms to international ones since the Chinese government mercantilist policies act as an albatross holding them down.

### **SHOULD AMERICA CARE ABOUT CHINESE MERCANTILISM?**

It's not as if American scholars, policymakers and others are not aware of the economic challenge from China, particularly as the Chinese government has shifted to an indigenous innovation strategy. Indeed, a growing number of books, articles, op-eds, speeches and forums are focused on Chinese innovation policy, particularly on whether it poses a threat to the U.S. economy. But there is considerable disagreement both over whether Chinese policy is mercantilist and whether it represents a threat to the U.S. economy. Understanding what China is doing and what the U.S. response should be (if any) is critically important and any response will shape U.S. economic prospects for decades. Unfortunately however, the debate about Chinese economic and innovation policy mostly gets it wrong.

On one side are the detractors. These are the analysts who look at China's heavy-handed statist practices, its lack of respect for intellectual property, and its massive subsidies of technology and argue that there is no way for this model to be successful, and therefore America does not need to worry. In his book *Advantage: How American Innovation Can Overcome the Asian Challenge*, Council on Foreign Relations Scholar Adam Segal argues that "Policymakers have overblown the threat of Asia." He goes on to argue with respect to Chinese innovation policies, that "without respect for rule of law and IP rights, as well as a culture of individual initiative and openness, these steps will not produce the intended results."<sup>221</sup>

Not only does Segal dismiss China as an innovator, he dismisses the type of innovation he thinks it will be good at. Segal argues that Asia's science and technology sectors, principally China's and India's, will probably catch up to and overtake the United States in what he calls the "hardware" of innovation—quantifiable factors such as the number of Ph.D.s awarded, investments in product innovation, number of patents obtained, facilities, etc.<sup>222</sup> However, he argues that the United States will continue to maintain a competitive advantage in innovation over Asia due to American advantage in the "software" of innovation, pertaining to the political, social, and institutional factors that move ideas from the lab to the marketplace. He argues that America's cultural values of individualism, social mobility, entrepreneurship, and limited barriers to market access will provide such a significant advantage as to make up for the United States falling behind on the "hardware" of innovation. Segal goes so far as to argue that U.S. inability to compete in hardware innovation is actually a positive that could fuel U.S. growth.

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While certainly the “software” of innovation is important, and the United States does have advantages there, to say that U.S. decline in the “hardware” of innovation is actually good represents a particular take on reality. For one, the United States’ past world leadership in innovation has rested on U.S. advantages both in the “hardware” and “software” innovation. Moreover, as other countries catch up to and surpass the U.S. to become leaders in the “hardware” of innovation, there is nothing to suggest that these countries won’t also catch up in the “software” of innovation, or that the United States is somehow special and destined to lead in innovation “software.” America needs both.

Segal is not alone. Chrystia Freeland, an editor for Thomson Reuters, writes in a *Washington Post* op-ed that: “China is an object lesson in the threat that centralized, authoritarian states pose to revolutionary technological development.”<sup>223</sup> She goes on to laud the American model: “The American political economy has many flaws—collapsing infrastructure, a hollowed-out middle class. But America has one great virtue that no other country has yet to replicate: When it comes to innovation and its translation into things people want, America is unbeatable.” If Freeland defines “unbeatable” as having been beaten by forty-two other nations, which as ITIF has shown we have been (America ranks forty-third of forty-four nations in the rate of progress on innovation-based competitiveness in the last decade), then yes we are “unbeatable.”<sup>224</sup>

Then there is the “China is about to fail” argument. No need to press the Chinese government on its mercantilist practices, things will take care of themselves. We should just be patient. Wang Feng, a director of the Brookings-Tsinghua Center for Public Policy in Beijing argues that “China’s shooting itself in the foot” with the one-child policy.”<sup>225</sup> He goes on to assert that China’s workforce will stop expanding and with its growth. In an article in *Foreign Affairs*, Derek Scissors argues that there is the real “possibility that Chinese growth will simply stop.”<sup>226</sup> In an article in *Foreign Policy*, Gordon Chang predicts the “coming collapse of China.”<sup>227</sup> In his book *The Next 100 Years*, George Friedman argues that, just as Japan “failed” in the 1990s, China will soon too.<sup>228</sup> But if you believe that Japan is a failure and China is becoming one, there’s no need to do anything.<sup>229</sup> No WTO cases. No international pressure. Just sit back and relax as the Chinese economy fails. To holders of the Washington consensus it’s impossible for any economy to succeed that does not practice the policies dictated by that consensus.

A related, but equally fallacious argument that is now in vogue is that America is succeeding in bringing jobs back from China. The corner has been turned, just be patient. For example, a widely cited Boston Consulting Group study predicted, “Within the next five years, the United States is expected to experience a manufacturing renaissance as the wage gap with China shrinks and certain U.S. states become some of the cheapest locations for manufacturing in the developed world.”<sup>230</sup> This was somewhat surprising as the same firm wrote a few years earlier that “the cost gap (with China) not only is unlikely to close within the next twenty years, but in some cases may actually increase.”<sup>231</sup> The reality, as noted before, is that China still maintains a huge labor cost advantage, it refuses to let the RMB appreciate more than a few percent, it continues to subsidize exports, and it is devoting massive resources to reducing high-tech imports and expanding high-tech exports. Moreover, according to the Ministry of Commerce, China is actively facilitating “the

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transfer of some industries to the central and western regions from the eastern part,” in order to preserve their low-cost production advantage.<sup>232</sup> This is not a scenario for U.S. manufacturing renaissance.

Another argument made by the “no need to anything” contingent is that there is no problem because foreign firms gain most of the benefits from China. Theodore Moran of the Peterson Institute argues that “China has remained a low value-added assembler of more sophisticated inputs imported from abroad—a ‘workbench’ economy.”<sup>233</sup> But this is increasingly not the case as China pivots toward indigenous innovation.

Likewise, others argue that Chinese policies don’t hurt the U.S. economy; rather they help U.S. multinational companies and U.S. consumers.<sup>234</sup> The logic is that if the Chinese government wants to subsidize exports, they are the misguided ones, for American consumers benefit. But Chinese policies such as forced tech transfer and IP theft, increasingly hurt U.S. multinationals. And while consumers may benefit from Chinese export subsidies they are hurt by other mercantilist policies such as IP theft and standards manipulation. Moreover, most U.S. consumers are also workers and their interests cannot be separated.

Finally, others argue that we shouldn’t complain about the loss of U.S. jobs to China since this is simply the logic of the free market system. But this is only partly true, for much of job loss stems from mercantilist policies. To argue that it’s the free market that dictates loss of jobs to China when much of its economy is state controlled, when it massively subsidizes exports, and when it steals IP and forces foreign companies to transfer technology, is a perversion of everything Adam Smith believed.

If we comfort ourselves with the belief that only economic policies based on the Washington consensus can effectively produce innovation and economic competitiveness, then it’s easy to justify complacency. Don’t worry be happy, the Chinese aren’t Americans; they’re following that deficient and misguided Beijing consensus. No need to boost R&D investment; no need to increase tax incentives for innovation; no need to improve science and engineering talent. And certainly no need to confront China on its mercantilist practices. These views (some more than others) are informed by a Washington consensus that holds that the only way to grow and to innovate is through *laissez faire* capitalism and anything contrary to that belief system is decidedly second class. But the Beijing consensus model has shown success; an economy growing at more than 10 percent per year for a decade is not failure. Moreover, on one level it’s irrelevant whether Chinese policies are successful (defined as creating innovation-based companies that are globally competitive). Even if they are not, the mercantilist portion of China’s policies damage the United States and other global economies by reducing U.S. corporate profits, lowering global productivity and innovation, increasing the U.S. trade deficit and reducing higher wage U.S. jobs.

The other prevailing view is the polar opposite: rather than see the Beijing consensus as a flawed model that can only lead to failure, including failed innovation, devotees see an industrial and technology leviathan, eating America’s technology lunch through superior implementation of world class technology policies. They would like to see the Beijing

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*The mercantilist portion of China's policies damage the United States and other global economies by reducing U.S. corporate profits, lowering global productivity and innovation, increasing the U.S. trade deficit and reducing higher wage U.S. jobs.*

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consensus replace the Washington consensus. The work of Doug Guthrie, Dean of the George Washington University School of Business, is the embodiment of this view. The author of numerous volumes on China, Guthrie sees the country as the new Jerusalem. It is the country that has gotten it largely right, and as a result is in the process of becoming a world leading economy. For Guthrie, China can do little or no wrong and it's because, not in spite of the fact that they embrace the Beijing consensus. For Guthrie, "The stunning success of China turns some key assumptions of economic theory on their head."<sup>235</sup> As one reviewer of his book *China and Globalization: The Social, Economic and Political Transformation of Chinese Society (Global Realities)* stated, "The excessive optimism of the book make it like an English version of a Chinese official textbook."<sup>236</sup>

So committed are the devotees of this view to defending China from "victimization" by the West that they go to extreme and often nonsensical lengths. A case in point is a recent *Washington Post* op-ed by Zachary Karabell, who argues that since China steals so much U.S. intellectual property and engages in so much forced technology transfer, it's a waste of time to try to fight it.<sup>237</sup> American firms should just innovate faster. And exactly how are they supposed to do this and why aren't they already innovating as fast as they can given the financial benefits from innovation? Karabell's advice is akin to saying don't bother putting on new door locks or calling the police after the thieves steal your stereo and TV every morning, just go to Best Buy and keep buying new ones.

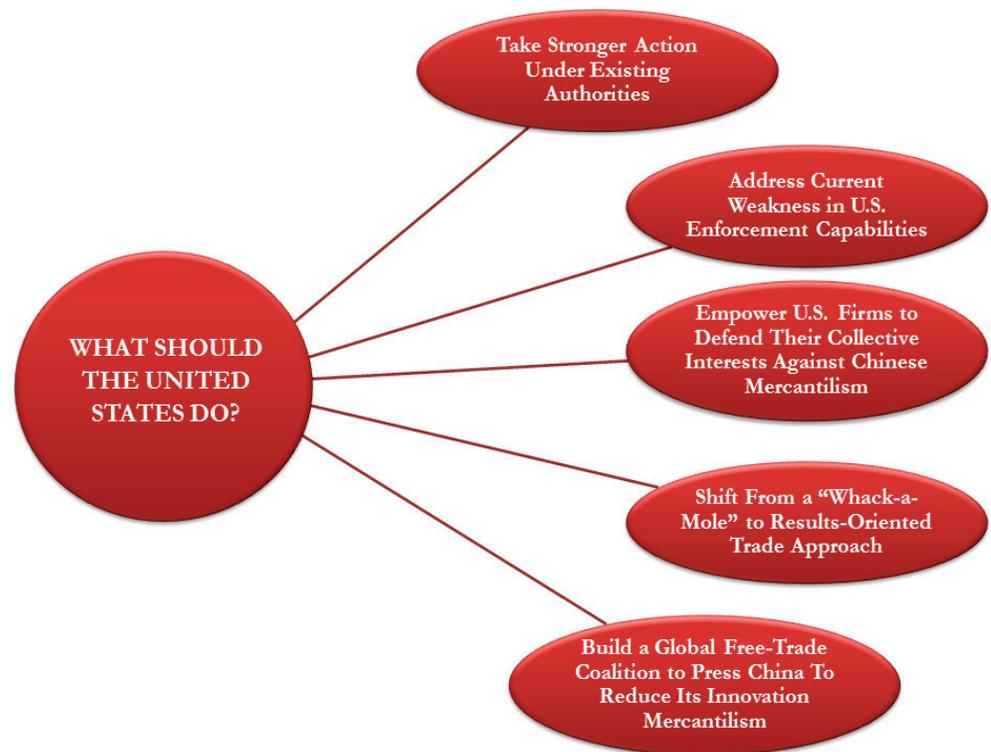
Indeed, when pressed about whether China is using mercantilist means to win, China devotees like Guthrie protest vigorously. No they say, our economic problems are all our own making, stop all this "China bashing." In the view of such China defenders, anyone who argues that Chinese intellectual property theft, forced technology transfer as a condition of market access, currency manipulation, government procurement bias in favor of Chinese firms, standards manipulation, and a host of other mercantilist practices are rampant and hurting the U.S. economy, is a China basher or worse.

Fortunately, some key figures in the international trade community are speaking out about the threat that China's innovation mercantilism poses to the global system. Charlene Barshefsky, who as U.S. Trade Representative under President Bill Clinton helped to negotiate China's 2001 WTO entry, argues that the rise of powerful state-led economies like China undermines the international trading system. She observes that when such countries decide that "entire new industries should be created by the government," they tilt the playing field against the private sector. Barshefsky argues that these types of mercantilist actions raise "significant and profound—almost theological—questions about the rules [of international trade] as they exist."<sup>238</sup> Likewise, Susan Schwab, U.S. Trade Representative under George W. Bush recently stated, "Foreign firms are in fact discriminated against in this (Chinese) market." She went on to say "The government of China itself is one of the principal perpetrators of this theft of intellectual property. State owned enterprises almost universally use pirated software."<sup>239</sup>

## WHAT SHOULD AMERICA, EUROPE AND OTHER MARKET-ORIENTED NATIONS DO?

Chinese economic mercantilism leads to lost jobs and economic output in the United States and many other nations. It distorts the global allocation of production in ways that lower global productivity. It reduces the incentives for the production of knowledge, thereby lowering global innovation. And as noted above, it is not even required for China to grow at a robust pace.

Moreover, there is no evidence that China intends to abandon its innovation mercantilism, at least any time soon.<sup>240</sup> Despite important ongoing efforts to engage the Chinese in dialogue (such as through the Obama Administration's Strategic and Economic Dialogue) this process is mostly helping to manage particular issues that come up. In cold war terms, it's containing, not rolling back Chinese mercantilism. It is therefore time that the United States and the global trading community at large take stronger action to press China to join the community of trading nations and curtail its mercantilist policies. The United States can and should take a number of specific steps unilaterally, but it should also encourage its like-minded trading partners to collectively take steps on a multilateral basis, including through the WTO.



**Figure 4: Five Steps The United States Should Take to More Effectively Fighting Chinese Economic Mercantilism.**

The single most important steps are to first recognize the severity of the problem and then commit to real, sustained and vigorous action to address it. As discussed above too many in Washington downplay the severity of the threat, seeing Chinese policies as irritating, but

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not a fundamental threat to the U.S. economy. Others, particularly neoclassical economists and their adherents, go out of their way to argue that Chinese mercantilism is not a threat to the U.S. economy, precisely because neither their economic models nor theories consider the possibility of a nation engaging in a strategy of absolute advantage (and because they don't even believe that nations compete economically).<sup>241</sup> In other words, policies based on the Beijing consensus can never top policies based on the Washington consensus, especially over the long haul. Until these views change and Chinese innovation mercantilism is seen as the serious threat to U.S. economic prosperity and technological capabilities that it is, U.S. responses will not be as strong as they should be, and will risk being trumped by other concerns, especially foreign policy ones.

The next step is to take serious action. It's not the purpose of this report to lay out a comprehensive set of action steps, although many are listed. Rather, trade and foreign policy experts both inside the U.S. government and out, need to make a concerted effort to explore and identify all possible avenues of action to reduce Chinese mercantilism.

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*Until Chinese innovation mercantilism is seen as the serious threat to U.S. economic prosperity and technological capabilities that it is, U.S. responses will risk being trumped by other concerns, especially foreign policy ones.*

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Finally, it's important to note that blame is not a strategy. In other words, it's easy for elected officials and the media to blame U.S. corporations for investing in China. If only XYZ Corporation would put America first instead of its profits then we'd see jobs returning to America, so the thinking goes.<sup>242</sup> But this strategy, if it can even be called one, is a dead end. Companies move establishments to China in part because the Chinese government makes them an offer they can't refuse without their customers and/or their shareholders abandoning them. It's up to the United States to make sure that the Chinese "offer" is fair and consistent with global trading norms and at the same time to make its own better offer (e.g., a more competitive corporate tax rate, more investment in research, a better skilled workforce etc.)

### **Take Stronger Action Under Existing Authorities**

There is more that the United States can do under existing authorities than it is doing. But this will require making confronting Chinese mercantilism a top goal of U.S. trade policy. Moreover, it will require expanding the resources of the United States Trade Representative's Office and changing its strategic focus. Given the scope of the challenge of fighting global, and especially Chinese mercantilism, USTR is significantly underfunded. The United States invests just 0.007 percent as much on defending its economy globally as it does on defending the nation militarily.<sup>243</sup> Even in a time of fiscal austerity, a modest expansion of the USTR budget, particularly tied to increased enforcement, may well be the best money the federal government will spend. President Obama's 2013 budget proposal is an important step in this direction, where he has called for a modest increase of \$2 million for USTR, but also an increase of \$26 million and the hiring of at least 50 people for a new U.S. panel to investigate unfair trade practices, as well as an additional \$24 million for the International Trade Administration for trade enforcement. The President's decision to create a new interagency Trade Task Force directed at Chinese mercantilist policies, is also an important step.<sup>244</sup>

Any increase in the USTR budget should be tied to a strategic reprioritization toward enforcement. Political leadership in USTR, regardless of Administration, more often than

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not focuses on promoting trade opening rather than enforcing existing trade agreements. Often defended in terms such as “If we don’t open markets, we can’t expand exports,” such a view ignores the fact that signing trade agreements is a two-way street: it allows expanded exports, but also expanded imports. Moreover, all too often trade agreements are not fully enforced and foreign markets not fully opened.

President Obama has proposed shifting USTR along with a number of other agency programs into a new cabinet level trade and business agency. Whether or not this is a useful step, USTR needs more resources and also to think more strategically about how trade and globalization, especially from China, are impacting U.S. competitiveness. USTR is still too often fighting the last war—the tariff war and the war to sign trade agreements. It’s not set up, either institutionally or philosophically, to fight the current war—the war against rampant innovation mercantilism fueled by a wide array of non-tariff barriers. To help address this, **Congress should authorize and appropriate \$5 million to create an Office of Globalization Strategy within USTR, run by a Deputy for Globalization Strategy.** Similar to the State Department’s Office of Policy Planning, the office would be staffed by an interdisciplinary team of about twenty individuals, with a diverse set of skills including economists (as of 2011, there were only three at USTR), policy analysts, attorneys, etc. experienced across competition policy, regulatory policy, standards, technology policy, and other realms. This group would be charged with systems thinking about the design of U.S. trade policy in the context of globalization to ensure renewed U.S. competitiveness.

Under the Obama Administration, more trade cases have been brought, but USTR needs to become even more assertive in bringing enforcement actions against China. USTR officials respond that they cannot bring WTO cases if U.S. companies will not supply evidence. Yet, companies often assert, rightly so, that they will face retribution from the Chinese government if they are associated with a WTO complaint. Companies will suddenly find that a permit or license they have been waiting for is mysteriously delayed. In other cases, they will be told that if they make waves they will be denied market access.

It is not reasonable to expect U.S. companies to have to make this kind choice. **The U.S. government should address this conundrum by making it national policy that USTR will bring cases whenever U.S. interests are being hurt through trade rule violations, even if U.S. companies don’t want them to proceed.** Some will argue that only companies know what is in their interest and that it is not the role of government to second guess this. But this overlooks the above noted reality that monopsony markets often do not produce economically optimal outcomes. Government action is needed to counter this market failure.

This policy would make it clear to countries like China that their threats to punish U.S. firms for bringing trade cases won’t work. And the first place to start would be to bring a case against China in the WTO for currency manipulation.<sup>245</sup> To be sure this will be politically difficult to do, but such a step would be in the interest of both the U.S. economy and most U.S. multinational companies.

The federal government needs to also do more on other fronts. **One important step is to increase funding for U.S. Customs to step up inspection for Chinese counterfeit**

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*Even in a time of fiscal austerity, a modest expansion of the USTR budget, particularly tied to increased enforcement, may well be the best money the federal government will spend.*

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**goods.** The U.S. government needs to make it extremely costly for companies in China to ship counterfeit goods into the United States by seizing and destroying the lion's share of such products at our borders. President Obama's FY2013 budget rightly adds \$13 million for Customs and Border Protection efforts to target pirated goods coming into the United States and \$10 million to post 16 Food and Drug Administration employees in China and three U.S.-based analysts to protect against unsafe imports. Congress should also increase the budget of the "U.S. International Trade Commission, while asking the ITC to conduct more analysis of Chinese mercantilist policies and their effects on U.S. firms and the U.S. economy.

In addition, there needs to be more coordination among agencies, including on messages. What is notable about China's engagement in trade issues is the unanimity of messaging among representatives of various Chinese ministries. They largely all stay "on message." In contrast, U.S. agencies all too often represent their own perspective, which can result in the transmission of conflicting messages. This represents a broader failure to develop a unified approach to China trade issues. For example, when responding to Chinese competition policy concerns, the Federal Trade Commission, Department of Justice, Department of Commerce and USTR need to work cooperatively to present a unified message regarding the U.S. position on China's competition policies. In this case, **the National Economic Council needs to assert its authority and ensure that there is a common unified message toward China's economic policy that is consistently delivered.** Moreover, U.S. government officials need to be stronger and more consistent in pushing back against the Chinese when they present "false equivalencies." (e.g., "yes, we may limit government procurement, but you have 'Buy American' provisions"). When Chinese officials make these kinds of claims it is important to consistently and effectively counter them.

Finally, even more broadly at the level of U.S. foreign policy, the United States focuses relatively more on human rights violations in China than on opposing its innovation mercantilism and securing employment rights for American citizens. The logic behind this is that if America can help instill in the Chinese population a desire for individual rights then they will be more likely to hold their government accountable and that this internal force will help limit Chinese mercantilism. While this is certainly possible, it is true that every time the U.S. government presses China on human rights it uses valuable political capital that could be used to make progress on rolling back Chinese mercantilist practices that harm the economic rights of U.S. workers. As such, **U.S. officials need to carefully consider the tradeoffs when pressing China on human rights issues and make sure that it is always putting U.S. economic interests first.**

Moreover, it's damaging to U.S. economic interests when the U.S. government pushes U.S. companies to withdraw from or limit their activities in China in response to human rights concerns. We have seen this over the last several years with Congressional efforts to pressure Internet and IT companies to directly challenge Chinese government information policies. However well intentioned, the principal result of these pressures is to reduce U.S. market share in China, and by extension U.S. jobs in these companies. China will still get the technology, either through its own companies (e.g., Baidu) or by from companies in other countries.

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Perhaps thirty or forty years ago America could afford to subordinate its economic interests for the political interests of people in other nations.<sup>246</sup> Today, it cannot. We are at a point where the pursuit of individual human rights must not be at the cost of U.S. national economic interest. When confronted with a nation whose economic policies are hurting the U.S. economy and U.S. jobs, American policy should put Americans first.

### **Address Current Weakness in U.S. Enforcement Capabilities**

Perhaps the most significant challenge facing the United States in pressing China to reform is that too many U.S. officials believe that they don't have sufficient arrows in the quiver to force China to change. They can harangue Chinese leaders at G-20 summits or attempt to persuade them at S&ED meetings, while taking the occasional WTO action. But, by and large, the view is that America is largely impotent to get China to change unless Chinese officials see it in their own interest. The best we can do, the thinking goes, is hope that they will change on their own before the damage is too great.

First, if this is actually true, it presents a fundamental indictment of the governance arrangement for the global trading system. The system is really so weak it can't address pervasive threats, then it really does need to be overhauled. But even so, there are more things that can be done under existing authorities. As such, this fundamentally passive stance must be revised because the status quo situation is not tenable. **It's incumbent upon the U.S. foreign trade establishment to thoroughly analyze all the current legal means by which we can pressure China to change and to take vigorous action based on those.** This should be an immediate priority.

But while necessary, this is not sufficient for much of what China does skirts international law. As a result, U.S. policymakers need to do two things. The first is to identify areas where stronger legal tools are needed and press for their implementation, either domestically or in global agreements like the WTO. For fundamentally the WTO system is designed around "trade" agreements relating mostly to imports and exports and issues like tariffs. Thus, it addresses issues like export restraints and export quotas. But more systemic distortions, such as government-run production cartels or the use of regulation and standards to discriminate against foreign firms is not really addressed. The second, as discussed below, is to band together with other like-minded nations to use the power of exclusion and multilateral pressure.

### **Empower U.S. Firms to Defend Their Collective Interests Against Chinese Mercantilism**

The federal government also needs to empower U.S. firms to more effectively defend their interest when dealing with China. One way is to make it cheaper to do so. Beyond facing retaliatory threats, there's another reason why U.S. companies don't bring more trade enforcement cases. They are expensive and the "free rider" problem means that companies can benefit if they can convince other firms in their industry to bear the burden of helping USTR to bring a trade case. In order to remedy this, **Congress should encourage companies to build WTO cases by allowing them to take a 40 percent tax credit for expenditures related to bringing the cases.**<sup>247</sup>

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*The Chinese government has shown that it can erect new mercantilist policies faster than the United States can get it to remove old ones. Thus, a new, results-based strategy needs to be developed.*

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A second way is to help U.S. firms take collective action. As discussed above, one key part of China's mercantilist strategy is to tie market access to technology transfer. Foreign companies often agree to it because they don't really have a choice; they either give up their technology or their access to the world's fastest growing market, and in the process lose out to competitors who are willing to make the essentially Hobson's choice.<sup>248</sup> Industrial organization economists refer to a market like this as monopsonistic: where one buyer can largely set whatever terms it wants to competitive sellers. One avenue is to pressure China through the WTO. However, this practice has been going on for years and to date not a single case has been brought, in part because Chinese officials deny any quid-pro-quo technology-transfer arrangement. We need a supplemental approach. **Congress should pass legislation that allows firms to ask the Department of Justice for an exemption to coordinate actions regarding technology transfer and investment to other nations.** For example, if companies in a similar industry can agree that none of them will transfer technology to China in order to gain market access then the Chinese government will have much less leverage over them. The same would be true if companies agreed that they would not invest in China until China improved its intellectual property protections. For those who worry that this would be somehow anti-consumer, it's important to realize that this would not apply to pricing issues.

### Shift From a “Whack-a-Mole” to Results-Oriented Trade Approach

The most important question for the United States is what its overall strategic goal should be vis-à-vis strategic trade engagement with China. To date that engagement has largely been what can be described as “whack a mole.” The United States expends some resources to identify, to respond to, and to combat particular instances of Chinese innovation mercantilism (the actual harms from which must be legally established). But even if it wins the battle, all too often the damage has already been done. U.S. trade policy vis-à-vis China rarely rises to the level of broader principles, such as insisting that China “desist with this generalized practice.” Because U.S. trade policies are organized in a legalistic framework to combat unfair trade practices on a case-by-case basis, it becomes more difficult for any administration to put in place a comprehensive trade strategy with respect to China.

Addressing the Chinese trade challenge through a whack-a-mole strategy has not succeeded in rolling back Chinese innovation mercantilism, even as the United States has won in some cases and lost in others. And it will ultimately be unsuccessful going forward because the Chinese government has shown that it can erect new mercantilist policies faster than the United States can get it to remove old ones. Thus, a new, results-based strategy needs to be developed.<sup>249</sup> **America, and the broader community of free trading nations, should hold China to the achievement of specific measurable goals.** One is the significant reduction of its global trade surplus. If this happened, many tensions would dissipate and China would enjoy much better economic relations with the United States and the rest of the world.

But while reducing its trade surplus is important, this would not be enough. For China could reduce its trade surplus and still unfairly gain global market share in high-value-added, technology-based industries that are vital to America's future. Moreover, China could manipulate its trade statistics to make it look like its trade surplus is smaller than it

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actually is. As such, China needs to make and be held accountable for specific, quantifiable commitments related to factors such as reduced levels of piracy, use of global rather than domestic technology standards, relief from requirements for joint ventures, and other measurable retreats from mercantilism.

Finally, China should commit to procedural goals as well. These should include the inclusion in their next five year plan of a serious commitment to supporting the productivity and growth of its non-traded sector. This is important because if the Chinese non-traded sector can grow faster in output and productivity, the Chinese government may feel less pressure to drive growth through exports. The next plan should also include specific goals such as measureable progress in the reduction of IP theft, including software.

### **Build a Global Free-Trade Coalition to Press China To Reduce Its Innovation Mercantilism**

While the United States needs to step up its unilateral actions against Chinese innovation mercantilism, to be fully effective it will need to enlist the support of other free-trading-based nations that have also been harmed by Chinese mercantilist. At the end of the day, these nations are going to have to abandon the notion that China will abandon its mercantilist policies if we and they just engage in dialogue with them.

Accordingly, a first step should be for the United States to work with the Europeans, Canadians, Australians, Japanese and whoever else will come aboard to lay out a renewed vision for globalization grounded in the perspective that markets should drive global trade and investment, that countries should not seek sustained trade surpluses, that currency prices should be set by the market (or at least not manipulated for competitive advantage); and that fair international competition and “good” innovation policies that leave all countries better off.

Many nations agree with these principles, but some, including China, do not. While China joined the WTO to reap its benefits, it has never really committed to WTO principles. This new alliance of free-trading nations needs to get progressively tougher on China until it significantly scales back its mercantilist policies. In addition, these free-trading nations should create a new trade zone, involving only those countries genuinely committed to adhering to the principles of open, free, and fair trade. Countries that insist on pursuing mercantilist strategies would not be welcomed into this new arrangement. The Trans-Pacific Partnership (TPP) could provide a model for how to organize such a new trade zone. The TPP represents a vehicle for economic integration and collaboration across like-minded Asia-Pacific region countries—including Australia, Brunei, Chile, Malaysia, New Zealand, Peru, Singapore, Vietnam, and the United States—that have come together voluntarily to craft a platform for a comprehensive, high-standard trade agreement.<sup>250</sup> But it’s unlikely that the TPP will work out this way, since a number of the nations involved have extensive mercantilist policies they are unlikely to eliminate.<sup>251</sup> **The United States should also work to establish a TAP, a Trans-Atlantic Partnership: a new trade agreement with Europe and perhaps all the Commonwealth nations.** This strategy reflects the view that the best way of dealing with China is not dealing with China. In other words, by focusing America’s trade attention elsewhere and excluding China from the

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community of free and fair trading nations, China can be pressured to begin to comport its behavior to global norms so that ultimately it could join this group

This proposal is not meant to be Pollyannaish. To be sure, every country, including the United States, has at least some mercantilist policies, usually as a result of internal political forces. Nor is it to say that only perfect countries with unblemished trade records can participate. But the point is that countries whose dominant logic toward trade is predicated on export-led growth and the use of beggar-thy-neighbor mercantilist practices would not be invited to participate (if any even exist). If countries want the benefits of participating in a global trade system, then they must play by the rules of that system.

At the same time, this free trade coalition should express to China its commitment to helping China get rich and its desire to have China be part of the global trading system. However, it should also express that China needs to play by the rules and achieve real results in its trade performance as described above, and that failure to make demonstrable progress on these goals will result in concrete actions by the group of free trading nations that could include collective implementation of import tariffs.

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*The World Trade Organization must also better understand that what has been transpiring in the global trading system is not occasional and random infractions of certain trade provisions by a wide variety of countries that need to be handled on a case-by-case basis.*

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The World Trade Organization must also better understand that what has been transpiring in the global trading system is not occasional and random infractions of certain trade provisions by a wide variety of countries that need to be handled on a case-by-case basis. Rather some countries, of which China is the most egregious, systematically continue to violate the core tenets of the WTO because its dominant logic toward trade is predicated on export-led growth through mercantilist practices. WTO officials need to wake up and realize that this constitutes a major threat to global integration. And if the WTO fails to recognize and react to this, it will only lead to more and more isolation and isolationism, and the cause of free trade and globalization will be undermined.

As such, **the WTO needs to focus on developing an enforceable regime that addresses the many non-tariff mercantilist actions nations take.** The WTO system is still largely about “trade” agreements relating mostly to imports and exports. Thus, it addresses export restraints and export quotas, but the root cause—a production cartel run by a government—is not addressed. One place to start to fix this would be to institute enforceable actions with regard to rules for joint venture requirements; and to base requirements on real conditions on the ground, not some provisions in a government legal code. There is no national security reason for China to extend joint venture requirements to as many industries as they do. A second area where new rules are needed regards SOEs. The idea that opaque, heavily subsidized, and favored SOEs compete in the global trading system competing with firms that must raise their own capital in the marketplace makes a mockery of the idea of fair and welfare enhancing competition. A third area is standards. Standards manipulation for competitive advantage should more easily be WTO-actionable.

Likewise, the International Monetary Fund (IMF) must redefine its role in the new global economy. The IMF was created to ensure exchange rate stability and encourage member countries to eliminate exchange restrictions that hinder trade. This was critical, for according to the IMF, “During the Great Depression of the 1930s, countries attempted to shore up their failing economies by sharply raising barriers to foreign trade, devaluing their

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currencies to compete against each other for export markets, and curtailing their citizens' freedom to hold foreign exchange. These attempts proved to be self-defeating."<sup>252</sup> Despite this mission of encouraging the elimination of trade restrictions, the IMF does little to achieve it. A case in point is the recent IMF staff report that stated the Chinese renminbi was "substantially undervalued" and that this was contributing to China's large trade surpluses. But China blocked official release of that report, a prerogative of IMF member countries, although most allow the release of the IMF staff's reports on their economies. **If the IMF is truly committed to open trade and market-oriented it will need to make rolling back Chinese (and other countries') mercantilism a top goal**, rather than turning a blind eye to it, or even enabling it by blaming its victims.<sup>253</sup>

## ARGUMENTS MADE AGAINST TAKING ACTION

While the United States and some other nations have complained about Chinese mercantilist policies and have pushed China on some individual policies, there has been no real comprehensive and sustained effort made to press China to significantly reduce its mercantilist policies. One major reason is that many U.S. policymakers do not appreciate the extent of global and U.S. economic harm caused by Chinese mercantilism. Another is that there is a widespread belief that "whack-a-mole" is an adequate strategy and that the China is making progress, albeit slow progress, since joining the WTO. As this report has hopefully shown, these beliefs are mistaken. Chinese mercantilism has harmed the U.S. economy and while China has made progress in some areas since joining the WTO it has regressed in others, especially around indigenous innovation. But there are three other important rationales for inaction offered by many in the Washington trade establishment: 1) the claim that America benefits from its trade relationship with China even if China is mercantilist; 2) the claim that America's economic problems are of its own making; and 3) the belief that taking any action against China risks starting a destructive trade war.

### **Claim: America Benefits From Trade With China, Even if China is Mercantilist**

Perhaps the most pernicious concept limiting tougher action against Chinese innovation mercantilism is the notion that as long as the United States is not mercantilist it still benefits from its trading relationship with China. William Buiter, Cambridge University economist and former head of the European Bank for Reconstruction and Development, summed up this view when he stated, "Remember: unilateral trade liberalization is not a 'concession' or a 'sacrifice' that one should be compensated for. It is an act of enlightened self-interest. Reciprocal trade liberalization enhances the gains, but is not necessary for the gains to be present."<sup>254</sup> In a similar vein, when asked at a recent salon dinner whether Chinese mercantilist policies hurt the U.S. economy, a Congressional Subcommittee Chairman responded, "Remember, Adam Smith proved that mercantilists only hurt themselves." Some even go so far as to state that by running a large trade surplus, China helps America by shipping capital back that finances American financial deficits. For example, neoclassical economists Fehr, Jokisch and Kotlikoff argue that China, in saving so much (by running large trade surpluses), helps the United States by providing cheap capital.<sup>255</sup>

These views are irrelevant at best and wrong at worst. They are irrelevant in the sense that even the most neoclassical of neoclassical economists should admit that mercantilism harms

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*Yes, America needs to take steps to be more innovative and competitive, but unless it also takes steps to press China to reduce its innovation mercantilism, these actions will fall far short of producing the kind of high-growth economy America needs.*

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economic efficiency. After all they are the first to decry such policies whenever they are proposed in the United States. Do they really think that China helps the global economy by not paying for intellectual property? By developing conflicting product standards so that global products must be made to two standards? By propping up less efficient companies that absent subsidies would have less global market share while more efficient global players reaped more? By forcing foreign companies to make investments where they do not want to (e.g., by forced JVs and tech-transfer requirements)?

They are wrong in the sense that the right question is not whether U.S.–China trade has hurt the U.S. economy—reasonable people can have different views of this issue. Although recent work by MIT economist David Autor has found that the last 15 years roughly one million U.S. workers lost jobs due to competition from China—about a quarter of all U.S. job losses in manufacturing during the time period.<sup>256</sup> Nor is it helpful to ask whether ending Chinese economic mercantilism would fix all or even most of America’s economic problems. Of course it wouldn’t. But the right question is whether reduced Chinese mercantilism would have non-trivial beneficial impacts on the U.S. economy. And on this question only the most zealous neoclassical ideologues or “Friends of China” would assert that it would not. Clearly Chinese mercantilist policies hurt U.S. companies, both here and in China. And while much of Chinese mercantilism lowers Chinese allocation efficiency, the fact that it hurts U.S. companies means that it hurts both China and America.

#### **Claim: It’s Our Fault**

Even if some will admit that Chinese economic mercantilism hurts the U.S. economy, many in the trade establishment ascribe America’s economic problems to America. According to this view, rather than focus on China’s unfair practices, we should instead get our own house in order. Scholars at the internationalist Carnegie Endowment write, “It is often easier to place the focus on reducing “global” imbalances or on reform of the international monetary system than to recognize that the politically thorny solutions to their problems lie at home.”<sup>257</sup> China scholar Dieter Ernst, writing in *China Daily* states, “China’s rise should serve as a wake-up call that we need to bring our own house in order.”<sup>258</sup> He goes on to argue, “To take advantage of the opportunities offered by China’s innovation push, the US government and private sector need to join forces to develop a national strategy that will enhance innovative capacity and create quality jobs in research, product development and engineering.” Former Clinton administration Treasury Secretary Robert Rubin agrees, stating, “As economic conditions in this country are very difficult right now, I think there is a strong tendency in the political system to think of China as the problem. I don’t believe that. I believe the problem is us. If we got our own house in order, with all the strengths we have, I think we can be extraordinarily competitive and really a robust part of the twenty-first century.”<sup>259</sup>

Of course, the United States needs to do more. As ITIF has long argued, the United States needs a national innovation and competitiveness strategy focused on technology, talent and taxes. But to leave out the fourth “T”, trade, is to akin to asking a horse to win the Kentucky Derby on just three legs. Yes, America needs to take steps to be more innovative and competitive, but unless it also takes steps to press China to reduce its innovation mercantilism, these actions will fall far short of producing the kind of high-growth

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economy America needs. This is not an either-or situation. It is important to take steps both at home to be more competitive and innovative and overseas to roll back Chinese (and other nations') innovation mercantilism. Just as focusing on Chinese innovation mercantilism doesn't absolve the U.S. political system from responding to very real domestic economic challenges it is also wrong to ignore such mercantilism.

### **Claim: Getting Tougher With China Will Risk Starting a Trade War**

Even if the Washington trade and foreign policy establishment became convinced that Chinese innovation mercantilism hurts the U.S. economy, many will assert that any efforts to combat it will backfire, leading to a destructive trade war and as such dramatically limiting a mutually beneficial trade with China.<sup>260</sup> The *Washington Post* writes that pressing China on their mercantilism “wouldn't lead to a jobs bonanza.... The last thing an already unstable global economy needs is a U.S.-China trade war.”<sup>261</sup> The *New York Times* agrees: “We have consistently argued against such punitive legislation, which could harm America's economy by unleashing a trade war.”<sup>262</sup> Jonathan Hoslag argues in *Foreign Policy* that even though in the past Europe “tolerated growing trade imbalances and was fairly patient with China's mercantilist policies” new European efforts to challenge particular Chinese mercantilist practices, represents a “protectionist backlash” and will trigger a “coming trade war.”<sup>263</sup>

Perversely, for the Washington trade and foreign policy community, fighting Chinese mercantilism is seen as succumbing to protectionism. And Chinese officials are happy to reinforce this view. Their key talking point is that we should all get along because we have common interests. Chinese Premier Wen Jiabao recently stated “China insists that dialogue is better than confrontation.”<sup>264</sup> Of course, when you are the party doing the attacking and the other side is not responding, you will always push for dialogue and cooperation, in order to avoid real counter-action.

To be clear, it is in the economic interests of the United States for China to be part of the global trading system. But this is only the case if China renounces its strategy of attaining absolute advantage through mercantilist policies. To argue that taking action, including pursuing multilateral action to put real pressure on China and hold them accountable will start a trade war misses the fundamental point: the trade war has already started, it's more than a decade old, and China has fired virtually all of the shots and done almost all of the damage. As columnist Robert Samuelson notes “There's already a trade war between them and us; but only one side is fighting.”<sup>265</sup>

It is a distortion of the notion of free trade to think that if America defends itself against mercantilist attacks it is starting a trade war. For the victims of Chinese mercantilism to begin to challenge these practices is not protectionism. To the contrary it is an attempt to restore the global, free market economy. Likewise, bringing cases before the WTO against Chinese mercantilism is not protectionist, it's a part of free trade. And retaliating against Chinese mercantilism with tariffs or other actions is only protectionism if it were to continue after China agreed to play by rules.

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Imagine if members of the U.S. national security community suggested that “Getting tough on our adversaries will just encourage them to attack us,” or “It’s okay for rogue nations to get nukes, after all we’ve got our nukes.” They would be ridiculed and expelled from the Washington national security establishment. Yet, when it comes to national economic security, this kind of thinking not only goes unpunished, it is rewarded as prudent and insightful.

Reducing Chinese mercantilism is not a silver bullet to end economic dislocation. Even if Chinese ends its mercantilist economic policies there will still be costly dislocation in the U.S. economy.<sup>266</sup> But even with this dislocation the U.S. economy will do better if it is trading with a non-mercantilist China, particularly if the United States adopts the right, proactive policies to spur its own competitive advantage in high value-added industries. But if Chinese policies continue to be based on absolute advantage and innovation mercantilism, the results will be more of the same: the absolute loss of U.S. industrial and high tech output, and the jobs and GDP growth that go with it.

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*It is a distortion of the notion of free trade to think that if America defends itself against mercantilist attacks it is starting a trade war.*

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### **WHAT’S PLAN B?**

The future of the U.S. economy depends on rolling back foreign mercantilism, especially China’s. But what if the United States tries and fails, or even worse, can’t mobilize a new “Helsinki consensus”? What then? What’s “Plan B?” As noted above, regardless of whether “Plan A” works or not, the United States still needs to develop a more robust national innovation and competitiveness strategy. An agenda to roll back Chinese mercantilism is necessary but not sufficient to winning on its own, nor is an innovation agenda sufficient on its own. One reason for implementing a robust innovation and competitiveness agenda is that for the United States to achieve success in negotiating with China it needs to be bargaining from a position of strength and the most important strength America can have is solid lead in technology. But we won’t maintain that lead if we do not also take steps domestically, including significantly more funding for industrially-relevant R&D; expanding the R&D tax credit, expanding high skill immigration and STEM education, etc.<sup>267</sup>

But even that won’t be enough if America can’t scale back Chinese mercantilism. In that case America will need to take much more fundamental steps to regain industrial traded sector competitiveness, which it should do regardless of its success vis-à-vis rolling back Chinese mercantilism. The first place to start is with the tax code. As ITIF has discussed, the United States needs a much more competitive corporate tax code, especially for traded sectors.<sup>268</sup> Implementing a bold reform means dramatically increasing the incentives for investing in the building blocks of productivity and innovation: R&D, new capital equipment, including software, and workforce training. To do this, Congress should create an Innovation and Investment Tax Credit (IITC), building off the Alternative Simplified Credit (ASC) for R&D. The ASC provides a credit of 14 percent on R&D expenditures above 50 percent of the average of the last three years. The credit could be even more effective if the rate were increased and applied only to investment above 75 percent of the average expenditures of the last three years. Moreover, because companies in the United States invest about half as much in workforce training as a share of GDP today than they did a decade ago, workforce training expenditures should also qualify for the credit. Thus

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Congress should establish an IITC with a credit of 45 percent of expenditures in R&D and skills training above 75 percent of base-period expenditures. But R&D and training are not enough. A robust traded sector depends on expended investment in new capital equipment. However, because capital expenditures are much greater than expenditures for workforce training, we propose that companies receive a lower credit of 25 percent on capital expenditures made in excess of 75 percent of their base-period expenditures. These incentives should not be paid for in the budget by offsetting increases in the corporate tax code. Otherwise, little will have been done to make the tax code more competitive.

A robust IITC would go a long way toward helping establishments in the United States become more competitive globally, both by reducing their tax liability and by encouraging them to invest more in the drivers of innovation and productivity. It would also make the United States a more attractive location for inward foreign direct investment. Moreover, when compared to an across-the-board corporate rate reduction, these incentives would be more targeted toward those industries and firms that are most exposed to international competition.<sup>269</sup> Software companies would get more incentives, law firms fewer. Automobile producers would get more, automobile rental companies fewer. This is because the former industries invest more in R&D, equipment and training.

In an era of budget deficits there will be natural concerns of how to pay for such incentives. The clear answer is to raise other, taxes. Congress could put in place a carbon tax.<sup>270</sup> It could repeal the mortgage interest deduction, raise the top marginal rate on individuals and make dividend income subject to the same rate as other earned income for individuals. It could create a border-adjustable corporate activity tax (like a value-added tax), such that imports would be taxed, not exports.<sup>271</sup> (More than 150 countries apply such a border-adjustable consumption tax on their imports, which imposes a tax burden on US exports.<sup>272</sup>) To argue that we can't afford to dramatically cut the effective corporate tax rate is inaccurate. Of course we can if policymakers are willing to take the politically difficult steps of raising other taxes especially on individuals. Ultimately, these are political choices but if America wants to maintain a globally competitive economy and if it can't roll back Chinese innovation mercantilism, halfway measures are home will not suffice.

## CONCLUSION

We have seen this movie before. In 1989, Shintaro Ishihara, then Japan's Minister of Transport, and Sony co-founder and chairman Akio Morita wrote an influential essay entitled "The Japan That Can Say No." It criticized the American economic model and advocated that Japan start standing up to America, including on economic policy issues. This was in large part a result of America pressing the Japanese to end their mercantilist practices. China is rapidly approaching the same position where they will soon be "The China That Can Say No" and when that happens, American leverage over China on economic issues will be greatly reduced.<sup>273</sup>

But at least for the foreseeable future China needs America more than America need China. It needs U.S. markets and U.S. technology. Therefore, America has leverage that it can use to exert meaningful pressure. It is therefore critical that the United States and its free-trade allies take the needed steps now to contain and roll back Chinese innovation mercantilism,

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before it is too late. The current “constructive engagement” with China is not enough. While it may produce a few wins here and there, it has made little progress in rolling back the overall thrust of Chinese mercantilism.

America need to act now to both begin to roll back Chinese mercantilism and rebuild America’s lost economic and technology strength through. Acting now is critical for each year that United States waits means losing some of the leverage it has. At some point within the next decade, the leverage of the free trading, market-oriented nations will be gone with the very real possibility of the Beijing consensus, rather than the Washington or Helsinki consensus holding sway, not just in China, but in much of the developing world. That would be bad for America, bad for the world, and ultimately bad for mercantilist nations. It’s time to say, “Enough is enough!”

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## **APPENDIX A: TARGETED TECHNOLOGIES LISTED IN CHINA'S GUIDELINES FOR THE IMPLEMENTATION OF THE NATIONAL MEDIUM- AND LONG-TERM PROGRAM FOR SCIENCE AND TECHNOLOGY DEVELOPMENT (2006-2020)."**

1. Industrial energy efficiency equipment
2. Long-life cycle LED products
3. Clean coal development and utilization, coal liquefaction, and gasification-based co-generation
4. Oil and gas prospecting, development, and utilization under complex geological conditions
5. Wind energy
6. Batteries
7. Solar-based power
8. Biomass
9. Geothermal energy
10. Super large electricity transmission and distribution networks
11. Sea water desalination
12. Deep-mine evaluation
13. Development and utilization of coal-bed methane and marine minerals
14. High precision prospecting and drilling equipment
15. Large mining machinery
16. Marine development platforms
17. Artificial rain enhancement
18. Water saving in irrigation, dry land farming, and biological water efficiency
19. Precision irrigation technology and intelligent farm water management
20. Desalination
21. Air-born geophysical survey techniques
22. 3-D high-resolution earthquake scanning
23. High-precision geomagnetism and geochemistry
24. Deep and complex mining
25. Wasteless mining
26. Automated ore preparation and smelting
27. Utilization of low-grade and complex mineral resources
28. Technologies for offshore oil-gas deposits
29. Comprehensive recovery technologies for thick-oil oilfields
30. Technologies for utilization of marine biological resources
31. Technologies for exploitation of seawater chemicals
32. Urban atmospheric pollution control systems
33. Technologies for non-conventional pollutants
34. Technologies for turning wastes into useful resources
35. Technologies for clean production in heavily polluting sectors
36. Marine ecological and environmental monitoring
37. Sea emergency response and handling
38. High-precision digital technologies for marine dynamic environment prediction
39. Biological carbon fixation and carbon-fixation engineering
40. Biotechnology for crop breeding and production
41. Biotechnology for animal and aquatic breeding and production

42. Biotechnology for animal diseases control
43. Processing of agricultural produce and post-production loss reduction
44. Food processing and food safety monitoring
45. Environment friendly fertilizers and pesticides
46. Precision farming operations
47. New farming industries
48. Factory-like agriculture
49. Efficient crop cultivation with super high yield
50. Modern farm machinery with multiple functions
51. Agriculture related information technology
52. Fine agricultural crop, tree, pasture, and aquatic species
53. Molecular evaluation of germplasm, animal and plant molecular breeding
54. Targeted hybrid breeding, scale seed breeding, reproduction, and comprehensive processing
55. Safe and high quality feedstuffs and facilities for scale-healthy breeding
56. Vaccines and safe veterinary drugs and instruments
57. Technologies for monitoring, diagnosing, preventing, treating and eradicating epidemic diseases affecting both humans and animals
58. Offshore and freshwater aquaculture
59. Ocean-going fishery and storage and processing
60. Processing of agricultural produce and specialty agricultural and forestry products
61. Conversion of agricultural and forestry biomass
62. Biomass energy production, including methane, fixed and liquid fuels, and new biomaterials
63. Resource-oriented utilization of rural garbage and contaminated water
64. Methane-based power generation
65. Biomaterial equipment
66. Technologies for combating biological invasion and ecological and meteorological disasters
67. Composite materials made of bamboo or wood
68. Environment friendly fertilizers and pesticides
69. Slow-release fertilizers
70. Prevention and control of hazardous organisms
71. Intelligent agriculture and forestry machinery
72. Technologies and equipment for healthy breeding
73. Farming machinery and technologies with protection functions
74. Greenhouse facilities and support equipment
75. Digital technologies for collecting animal-plant growth and ecological environment-related information
76. Real-time monitoring of soil elements, including moisture, fertilizer, light, and temperature
77. Precision operation and management and digital technology dedicated to remote rural areas
78. Viewable information service, agriculture and forestry ecosystem monitoring
79. Virtual farm technology
80. Fast breeding of high quality stud bulls
81. Industrialized production of dairy cow fetuses
82. Cow feeds

83. Cultivation and effective utilization of pasture
84. Animal diseases prevention and control
85. Scale breeding
86. Parts and components and associated design, manufacturing, and mass production
87. Advanced molding and processing technologies for large and special parts and components
88. Technologies for generic parts and components
89. Precision test instruments
90. Digital design, manufacturing, and integration technologies
91. Network-based digital and intelligent design approaches
92. Computer-aided engineering analysis and process-design and integration technologies
93. Environment friendly processes and manufacturing technologies
94. Techniques, processes and equipment for efficient utilization of resources
95. Technologies for process scale-up
96. Ecological industry concept-based system integration and automation
97. Sensors and intelligent testing and control technologies, equipment, and control systems needed by process industries
98. Large cracking furnace technology
99. Large steam ethylene cracking technology and set equipment
100. Energy efficient chemical fertilizer process and equipment
101. Cyclic utilization of secondary resources from steel productions
102. Cogeneration technology for metallurgical processes
103. Gradient utilization technology for low thermal value steam
104. Efficient and low-cost clean steel production
105. Non-adhesive coking, integration design, manufacturing, and system coupling technologies for large continuous plate casters and continuous rollers
106. Large-scale marine engineering technologies and equipment
107. High-performance composite materials
108. Super large compound components
109. High-performance engineering plastics
110. Light high-intensity metals
111. Inorganic non-metal structural materials
112. High-purity materials
113. Rare earth materials
114. Petrochemicals
115. Precision chemicals
116. Catalysts
117. Separating materials
118. Light textile materials and associated applications
119. Environment friendly green and healthy materials.
120. Next-generation information functional materials and components
121. Key accessory materials and engineering processes for the defense industry
122. Technologies for traffic information system and intelligent process
123. High-speed transport systems
124. Traffic information sharing
125. Traffic operation management
126. Integrated transport system

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127. Energy savings in transportation
  128. Cross-bay routes
  129. Offshore deep water harbors
  130. Large airports
  131. Large bridges and tunnels
  132. Integrated 3-D traffic hubs
  133. Deep sea oil-gas pipelines
  134. Other sophisticated transportation infrastructure.
  135. High-speed rail control and speed regulation systems
  136. High-speed rail locomotive building
  137. Rail line construction, and system integration
  138. Rail operation control
  139. Hybrid, alternative fuel, and fuel cell automobiles
  140. Power system integration and control technologies for autos,
  141. Automobile computation platform technologies
  142. High-efficiency internal combustion engines
  143. Fuel cell engines
  144. Accumulator batteries
  145. Driving motors and other critical components for electric cars
  146. Infrastructure for automobiles using new energy
  147. Heavy-duty passenger cars
  148. Large power locomotives
  149. Special heavy duty vehicles,
  150. Urban rail transit systems
  151. Large high-tech ships
  152. Large ocean-going fishing boats
  153. Scientific expedition ships
  154. Novel shipping tools, including lower altitude multipurpose aircrafts
  155. High viscosity crude oil and multiphase flow pipeline transport systems
  156. Traffic information platforms
  157. Modern logistic systems
  158. Urban traffic control systems
  159. Intelligent automobiles
  160. New generation air traffic control systems
  161. Traffic accident prevention and pre-warning
  162. Emergency handling, active/passive safety for transport tools
  163. Traffic accident reconstruction
  164. Fast traffic-emergency-response system
  165. Quick search and rescue missions
  166. Integrated circuits and key components
  167. Major software
  168. High performance computers
  169. Broadband mobile telecommunication
  170. Next-generation internet
  171. Integrated innovation in information technology products
  172. Design and manufacturing capability of IT products
  173. Highly credible networks
  174. Network information security
  175. Technical support systems for information security

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176. Handling information security emergencies
  177. Online software platforms
  178. Enabling application software
  179. Medium ware
  180. Built-in software
  181. Grid computation platforms and infrastructure
  182. Software system integration
  183. Finance
  184. Logistics software
  185. Online education
  186. Media software
  187. Health care IT
  188. Tourism IT
  189. E-government
  190. E-commerce
  191. High performance core network equipment
  192. Telecommunication transmission equipment
  193. Telecommunication connecting equipment
  194. Network scalability, security, mobility, service quality, and operation management
  195. Network management system
  196. Intelligent terminals
  197. Household network equipment
  198. Broadband-related new businesses
  199. Multimedia
  200. Network computation
  201. Super trustworthy computer with at least a thousand trillion floating-point operations per second
  202. Next-generation server systems
  203. Innovative system structures
  204. Mass data storage
  205. Data fault tolerance
  206. Advanced automatic barcode identification
  207. Radio frequency tags
  208. Multiple sensor information-based intelligent information processing
  209. Low-cost sensor networks
  210. Real-time information processing systems
  211. More powerful information service platforms and environment
  212. Digital media content processing
  213. Comprehensive media information content platforms featuring easy accessibility, interaction, copyright protection, and effective management.
  214. Flat-panel and projection display technologies, including high definition large flat-panel display products, organic electroluminescent display, field emission display, and laser display
  215. Flat-panel display materials and components
  216. National infrastructure information network systems
  217. Coding technologies for network survival under complex large systems, active real-time protection
  218. Safe data storage

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219. Information network virus control, prevention of vicious attacks on web pages
  220. Network credit systems
  221. Reproductive health drugs and instruments
  222. Disease prevention and early diagnosis
  223. Innovation in Traditional Chinese Medicine
  224. Major new drugs and advanced medical equipment
  225. Medicinal materials
  226. Drug-release systems
  227. Safe and effective contraception
  228. Drugs for the prevention of sexually transmitted diseases
  229. Screening, test and diagnosis of birth defects and for biological treatment of inherited diseases
  230. Early warning and diagnosis of major diseases, including cardiovascular and cerebrovascular diseases and tumors
  231. Technologies for standardized, individualized and integrated treatment
  232. Compact mobile medical service equipment and distance diagnosis and technical service systems
  233. Novel therapeutic equipment
  234. Conventional diagnostic and therapeutic equipment
  235. Digital medical technologies
  236. Individualized medical engineering technologies and equipment
  237. Nanotechnology-based biological drug-release systems
  238. Tissue engineering
  239. Bio-medicinal materials such as proxy human tissues and organs
  240. Urban energy efficiency
  241. Long durability, green construction materials
  242. Integrated digital urban management technology
  243. Green building structures
  244. Hazardless handling and recycling of urban sewages and garbage
  245. Urban traffic system
  246. Intelligent urban public transit management
  247. Urban utility infrastructures
  248. Urban underground development and utilization
  249. Green architecture design technologies
  250. Architecture energy-saving technology and equipment
  251. Precision construction technologies and equipment
  252. Energy efficiency and green construction materials
  253. Indoor pollutants monitoring and cleanup
  254. Monitoring, warning, and preventing coal mine and other production-related accidents, social emergency events, natural disasters, nuclear safety, and biosecurity
  255. Rescue technologies for coalmine disasters, major fires, major natural disasters, leakage of hazardous chemicals, and mass poisoning
  256. Production safety, food safety, biosecurity and public safety, and associated protection products
  257. Multi-scale dynamic information analysis and handling, and decision making
  258. Integration technology for a national public-security-emergency command platform and an integrated emergency decision-making platform featuring early monitoring, quick advance warning, and efficient handling

259. Pre-warning and control technologies for mine gas, water bursting, power failures, and major industrial accidents
260. Food safety
261. Entry-exit quarantine related risk assessment
262. Biological characteristic identification, evidence gathering, quick screening, ratification, and simulation prediction
263. Technologies for distance positioning and tracking, real-time monitoring, evidence identification, and quick handling
264. Fire-fighting in high-rise buildings and underground structures
265. Distance probe of explosives, illegal drugs, and nuclear and biological sources of terrorism, and on-site handling and protection
266. Detection of in-body toxic chemicals
267. Advanced disinfectors
268. Hazardous medium identification and control
269. Biological invasion prevention and control, and vaccines
270. Immunoadjuvant, antitoxin, and other drugs
271. Technologies for monitoring, warning, and emergency handling of earthquakes, typhoons, torrential rains, floods, and geological disasters;
272. Core electronic devices
273. High-end generic chips and basic software
274. Super large-scale integrated circuit manufacturing technology
275. Next generation broadband mobile telecommunication
276. High-end numerically controlled machine tools and basic manufacturing technology
277. Large, advanced pressurized water reactors
278. High-temperature gas-coolant reactor nuclear power stations
279. Water-body-contamination control and treatment
280. Major new drugs, prevention and treatment of major infectious diseases such as HIV/AIDS and viral hepatitis, large passenger aircrafts
281. High-resolution earth observation systems
282. Manned space flights
283. Moon probe
284. Genome sequencing and genetic structure analysis
285. Functional genome, proteomics, stem cells, and therapeutic cloning, tissue engineering, biocatalysis, and conversion technologies
286. Scale identification of key genetic functions and their regulatory networks in the physiological and pathological process
287. Identification of functions of disease-causing genes, expression manipulation, target screening, and verification
288. Drug manufacturing from “gene to drug”
289. Protein and dynamic cellular process and associated bioinformatic analysis, consolidation, and simulation
290. Virtual plant-animal species and drug design technology
291. Simulation technology for plant-animal species growth and pharmaceutical metabolism engineering
292. Computer-aided composite bank design, synthesizing, and screening.
293. Gene manipulation technology
294. Protein engineering
295. Highly effective protein expression and regulation

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296. Chromosome structuring and positioning
  297. Coded protein gene design and transformation technology
  298. Protein peptide chain decoration and restructuring technology
  299. Protein structure analyzing technology
  300. Scale protein isolation and purification technology
  301. Therapeutic cloning technology
  302. In-vitro stem cells construction and directional induction technology
  303. In-vitro human tissue construction and associated scale production technology
  304. Multiple human-cell-based sophisticated tissue construction and dysfunction repairing technology
  305. Biomanufacturing technology
  306. Screening technology for functional biotech strains
  307. Directional biocatalyst upgrading technology
  308. Biocatalysis technology system for scale industrial production
  309. Clean transformation media manufacturing technology, and associated industrialized transformation process
  310. Low-cost, pervasive computation, and intelligent process
  311. Integration of nanotechnology, biotechnology, and cognitive science
  312. Low-cost ad hoc networks
  313. Individualized intelligent robots and human-machine interactive systems
  314. High-flexibility attack-free data networks
  315. Advanced information security systems
  316. Intelligent information processing and control technologies based on biological characteristics
  317. Image and natural language comprehension
  318. Developing processing systems for Chinese language information
  319. Systematic technologies involving biological characteristics identification
  320. Intelligent traffic systems
  321. Ad hoc mobile networks
  322. Ad hoc computing networks
  323. Ad hoc storage networks
  324. Ad hoc sensor networks
  325. Low-cost real-time information processing systems
  326. Multi-sensor information integration
  327. Individualized interactive interface
  328. Attack-free data networks
  329. Advanced information security systems
  330. Ad hoc intelligent system
  331. Intelligent personal system
  332. Virtual reality technology for integrating different disciplines, including electronics, psychology, cybernetics, computer graphics, database design, real-time distribution system, and multimedia technology
  333. Virtual reality technologies and associated systems for related fields, including medicine, entertainment, arts, education, military affairs, and industrial manufacturing management
  334. Breakthroughs in material design, assessing, and characterizing
  335. Advanced manufacturing and processing technologies for materials
  336. Nanomaterials and nanocomponents
  337. Special functional materials such as superconductor materials

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338. Intelligent materials
  339. Energy materials
  340. Super structural materials
  341. New generation optoelectronic information materials
  342. Intelligent structural systems that integrate sensors, control, and drive functions
  343. Intelligent material manufacturing and processing
  344. Intelligent structure design and manufacturing
  345. Key equipment monitoring
  346. Failure control
  347. High-temperature superconducting materials and associated manufacturing technology
  348. Superconducting cables
  349. Superconducting motors
  350. Superconducting electric devices
  351. Superconducting biomedical elements
  352. High-temperature superconducting filters
  353. High-temperature superconducting injury-free detectors
  354. Scanning magnetic microscopes
  355. Critical technologies for solar-cell-related materials and associated key technologies
  356. Fuel cell materials
  357. High-volume hydrogen storage material technology
  358. Efficient rechargeable cell materials and associated key technologies
  359. Key super capacitor materials and associated manufacturing technology
  360. Efficient energy conversion and storage material systems
  361. Intelligent manufacturing and application technology
  362. Set equipment and system design and verification technology
  363. High-reliability-based large sophisticated systems and equipment design technology
  364. Design, manufacturing, and test technologies for micro and nanometer electro-mechanic systems
  365. Technologies for micro and nanometer manufacturing
  366. Super precision manufacturing
  367. Giant system manufacturing
  368. Intense field manufacturing
  369. Intelligent service robots
  370. Service life prediction technology for major products and facilities
  371. Onsite manufacturing process test and evaluation technology
  372. Fourth-generation nuclear energy system, advanced nuclear fuel cycle, and fusion energy
  373. Hydrogen technology
  374. Fuel cell and distributive energy supply technology
  375. Fuel cell components, thermopile integration, fuel cell applications to power generation and automobile propulsion systems
  376. Mini gas turbines
  377. Thermal cycle, energy storage, and triple-generation technology
  378. Fast neutron nuclear reactor
  379. Large superconducting magnets

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- 380. Microwave heating and driving
  - 381. Neutral beam injection heating and blanketing
  - 382. Large real-time tritium isolation and purification, diverters, numerical modeling, plasma control and diagnosis
  - 383. Non-Tokamak approaches for energy
  - 384. Natural gas hydrates exploitation
  - 385. Sea-floor metal and mineral resources gathering and transport
  - 386. On-site mining extraction
  - 387. Large marine engineering projects
  - 388. Remote marine sensing technology
  - 389. Acoustic probe technology
  - 390. Buoy technology
  - 391. Shore-based long-range radar technology
  - 392. Marine information processing and application technology
  - 393. Sea-floor geophysics, geochemistry, and biochemicals, capable of transmitting information and data on a real-time basis
  - 394. Natural gas hydrate deep seafloor extraction
  - 395. Deep-ocean operation technology
  - 396. Life-maintaining system technology
  - 397. High-power dynamic device technology
  - 398. High-fidelity sample collection and distance information transmission technology
  - 399. Deep-sea operational equipment manufacturing technology
  - 400. Deep-sea space station technology
  - 401. Lasers
  - 402. Aerospace<sup>274</sup>

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