

**“The Impact of International Technology Transfer on American Research and Development.”**

**Testimony of the Honorable Dennis C. Shea**

**before the**

**Committee on Science, Space, and Technology Subcommittee on Investigations and Oversight  
United States House of Representatives**

**December 5th, 2012**

Chairman Broun, Ranking Member Tonko, and Members of the Subcommittee, thank you for the opportunity to appear today to discuss transfers of domestic technology and intellectual property to the People’s Republic of China (PRC). As Chairman of the U.S.-China Economic and Security Review Commission (USCC), I will share some of the Commission’s findings with you; however, the views I present today are my own.

**OVERVIEW**

Technology transfer is just one part of a multi-faceted strategy by the Chinese government to move China’s economy to a higher position on the value-added, high-technology industrial chain and to develop a culture of innovation. Along with “forced” transfers, this strategy includes acquisition of foreign companies and technology through mergers and acquisitions; trade policies designed to benefit Chinese industries; incentives to encourage foreign companies to undertake research and development operations in China; huge investments in research and infrastructure; and industrial and cyber espionage. While there has been some market reform in China, the government still engages in centralized planning in an attempt to control the economy and guide growth. Two such plans that are relevant to technology transfer are the “Medium- to Long-term Plan for the Development of Science and Technology” (MLP) and the 12th Five-Year Plan. These plans propose to leapfrog international competitors by harvesting and building upon foreign-developed technology, a process that my co-witness, Dr. Robert Atkinson, has called “innovation adaptation.”

China’s MLP is a “grand blueprint of science and technology development” to bring about “innovation with Chinese characteristics.” It was released in January 2006 and seeks to make China a “world leader” in science and technology by 2050. The plan commits long-term funding to a series of mega-projects in high-tech industries; sets targets for research and development spending; introduces a comprehensive set of subsidies and tax incentives to encourage development of specific technologies; and incentivizes collaboration between government research institutes and the corporate sector.

China’s 12th Five-Year Plan, released in March 2011, places an emphasis on moving away from labor-intensive and low-skilled manufacturing toward more sophisticated production. It specifically focuses on the development and expansion of seven strategic emerging industries: new-generation information technology, high-end equipment manufacturing, advanced materials, alternative-fuel cars, energy conservation and environmental protection, alternative energy, and biotechnology.

The Commission addresses many of these broader issues in its 2012 Report to Congress, which was released to the public on November 14<sup>th</sup> and which contains a section on Chinese efforts to become a more innovative society. Today I will focus my testimony on Chinese government efforts intended to transfer technology from the United States and other developed nations to China and Chinese companies.

Technological improvements are a critical way for countries to enhance global competitiveness and to improve the quality of life for their people. The United States welcomes international competition and we believe it is in our best interest to see China develop and rebalance its economy. That said, transfers of technology must occur on a level playing field. Unfortunately, China maintains policies of forced technology transfer in violation of international trade agreements and international norms as a condition of obtaining access to the Chinese market.

Paragraph 7.3 of China's Protocol of Accession to the WTO prohibits China from conditioning the approval of investment by foreign companies on the transfer of technology,<sup>1</sup> but these provisions are easy to circumvent. In the past, China imposed explicit requirements on foreign companies to transfer technology in exchange for access to the Chinese market. However, in order to comply with WTO prohibitions, China has changed these mandates into implicit, de facto requirements. Foreign companies in certain sectors must form joint ventures with Chinese firms to gain access to the Chinese market. Such joint ventures frequently entail the transfer of technologies to the Chinese partner. Chinese government requirements for technology transfer are implied in documents such as the Five Year Plan and MLP, and through laws requiring government approval of joint ventures with foreign firms.

Because Chinese technology transfer requirements are implicit, and because U.S. businesses are often reluctant to share information for fear of retribution, we do not have a full understanding of how U.S. companies are being pressured to transfer technology to China. Even so, we can gain insight from the methods by which the Chinese government encourages technology transfer, which can include requiring the transfer of technology in order to (1) gain access to Chinese markets, (2) be considered for procurement by the Chinese government, or (3) benefit from Chinese subsidies and incentives.

## MARKET ACCESS

Depending on the industrial sector, the Chinese government requires many foreign companies to enter into joint ventures with Chinese firms in order to do business in China. The relevant rules are laid out in the Catalogue of Industries for Guiding Foreign Investment ("Catalogue"), which was first introduced in 1995 and last revised in 2011. The Catalogue comprises over 450 industries, forty of which are designated as completely off-limits to foreign investors. The remaining industries in the Catalogue are classified as either "encouraged" or "restricted" for foreign investment. In nearly 100 of those industries, foreign investment is subject to ownership restrictions. About half of those restrictions require foreign investors to form joint ventures - equity, cooperative, or contractual - with Chinese partners. The other

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<sup>1</sup> PROTOCOL ON THE ACCESSION OF THE PEOPLE'S REPUBLIC OF CHINA, General Provisions, 7.3, Non-tariff Measures: *"China shall, upon accession, comply with the TRIMs Agreement, without recourse to the provisions of Article 5 of the TRIMs Agreement. China shall eliminate and cease to enforce trade and foreign exchange balancing requirements, local content and export or performance requirements made effective through laws, regulations or other measures. Moreover, China will not enforce provisions of contracts imposing such requirements. Without prejudice to the relevant provisions of this Protocol, China shall ensure that the distribution of import licences, quotas, tariff-rate quotas, or any other means of approval for importation, the right of importation or investment by national and sub-national authorities, is not conditioned on: whether competing domestic suppliers of such products exist; or performance requirements of any kind, such as local content, offsets, the transfer of technology, export performance or the conduct of research and development in China."*

restrictions go a step further, requiring the Chinese partner to hold a controlling or dominant stake. The majority of restrictions apply to manufacturing industries, in particular the automotive sector. In strategic sectors like financial services and mining, ownership restrictions are the norm.

The Chinese companies that form these joint ventures often require their foreign partners to transfer technology to the joint venture entity established by the foreign and Chinese partners as a pre-condition for the establishment of the joint venture. Additionally, Chinese law requires government approval of foreign joint venture agreements.<sup>2</sup> Since the size and rapid growth of China's market makes it vital to many foreign businesses, especially as current consumer demand in the United States and Europe is weak, foreign affiliates of U.S. and Europe based companies often transfer technology or technological knowhow to their Chinese partners in expectation of contracts and market access.

China claims that it is not violating WTO prohibitions because the actions taken by foreign companies are purely business decisions. This is a specious argument. In its 2012 National Trade Estimate Report on Foreign Trade Barriers, the United States Trade Representative said:

*Although China has revised many of its laws and regulations to conform to its WTO investment commitments, some of these measures continue to raise WTO concerns, including those that 'encourage' technology transfers to China, without formally requiring them. U.S. companies remain concerned that this 'encouragement' in practice can amount to a 'requirement,' particularly in light of the high degree of discretion provided to Chinese government officials when reviewing investment applications.*

In his book, *No Ancient Wisdom, No Followers: The Challenges of Chinese Authoritarian Capitalism*, James McGregor says this about the "voluntary" nature of Chinese technology transfer standards:

*The global financial crisis of 2008 was a game changer for the relationship between China and the world's multinationals that populate this district. The Chinese bureaucracy appeared to conclude that foreigners now need China more than China needs the foreigners. This was evident in the aggressive arm-twisting of foreign companies to hand over their latest technology to Chinese national champion SOEs as the price of market access. The complaints from foreign governments and multinationals led to softened Indigenous Innovation rhetoric and a few policy adjustments. With the more subtle Strategic Emerging Industries initiative, voluntary became the new mandatory. Technology transfer requirements are not put in writing. Instead, verbal requests to "voluntarily" share technology became the market access requirement. "That is the lesson of Indigenous Innovation," said a China-based senior executive of a technology multinational. "Don't write things down clearly. Spread the regulations verbally."*

In addition, in January of this year, a coalition of U.S. manufacturers, represented by the law firm Stewart & Stewart, alleged that a broad range of Chinese support policies, including technology transfer

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<sup>2</sup> LAW OF THE PEOPLE'S REPUBLIC OF CHINA ON CHINESE-FOREIGN JOINT VENTURES, Article 3: "The joint venture agreement, contract and articles of association signed by the parties to the venture should be submitted to the competent foreign economic and trade department of the state (hereafter referred to as the "examining and approving organ") for examination and approval; and the examining and approving organ shall, within three months, decide whether to approve or disapprove them. After approval, the joint venture should register with the competent administration department for industry and commerce, obtain a license to do business and start operation."

requirements, violate China's WTO obligations. Whether or not to engage in technology transfer in exchange for access to the Chinese market through a joint venture agreement is not a decision that U.S. companies, or any foreign company, should be forced to make. Unfortunately, this is the reality that many of our businesses face.

Foreign companies operating in China face a common challenge of trying to protect their long-term interests while transferring some technology to Chinese partners in exchange for market access. Some companies, such as General Motors (GM) and Boeing, appear to have benefitted from their joint ventures in China. On the other hand, companies such as Siemens have complained publicly about China's technology transfer requirements.

In June 2011, the Commission held a hearing on "China's Five Year Plan, Indigenous Innovation, and Outsourcing." At the hearing my colleague, the Vice Chairman of the Commission, Bill Reinsch, asked Dr. Eswar Prasad, an economics professor at Cornell University and the former Chief of the Financial Studies Division in the International Monetary Fund's Research Department, what he thought about the dilemma faced by companies that are asked to transfer technology to gain access to the Chinese market. Dr. Prasad responded: "My sense is that trying to turn over technology to China in order to willingly be co-opted in terms of getting market access is a very high price to pay.... Now, for a corporate leader who is worried about quarter-to-quarter earnings... that can be a pretty serious concern. But if I had the ability to stop worrying about the quarter-to-quarter returns, I would... be very concerned about this Faustian bargain because it's very difficult, given the present [Chinese] intellectual property regime, to really guarantee that there will not be technology that is dissipated within China." My colleague noted that U.S. companies are "trying their best not to give away the store. That doesn't mean that they succeed."

The success of these companies often rests on keeping their Chinese partners happy with the partnership. For example, last year Shanghai GM – a US-Chinese joint venture – sold 2.5 million cars and trucks in China, posted \$30 billion in revenue, and \$3.2 billion in profit. General Motors received about \$1.5 billion profit from the venture. While GM believes this partnership to be in its best interest, its managers have expressed the desire to maintain control over critical technology, such as new battery technology, that their Chinese partners are interested in.

There are multiple examples of how forced technology transfers have caused problems for foreign companies in China.

In the high-speed rail sector, Siemens and other firms transferred sensitive technology to joint venture partners in expectation of future contracts that never transpired. Siemens formed a joint venture with China National Railway (CNR) to build the Beijing-Tianjin high-speed railway in a deal worth \$1 billion. Of 60 trains, 57 were built in China at the CNR facility. For the follow-on deal to build the Beijing-Shanghai rail line, CNR obtained the contract, while Siemens only delivered the components. In July 2010, China's Railway Ministry denied any allegations of forced technology transfer despite complaints by Siemens and other foreign companies.

In the automotive sector, the 1994 Automotive Industry Policy instituted a law requiring all foreign car companies to form minority-owned joint ventures with Chinese firms in order to enter the Chinese market. This law is still in place today. In addition, the National Development and Reform Commission's (NDRC) 2004 Policy on Development of Auto Industry increased import tariffs and mandated an extremely high domestic content clause, in order to force more foreign automakers to produce in China.

At the same time, the government has done little to enforce penalties against intellectual property theft. Chery – a former subsidiary of Volkswagen (VW) joint-venture partner SAIC – allegedly used VW produced parts in its cars illegally. Volkswagen planned a lawsuit, but instead agreed to an out of court monetary settlement to be assumed solely by SAIC. There have been other alleged counterfeit incidents as well, such as a dispute between Chery and General Motors (GM claimed the Chery QQ was a copy of the Chevrolet Spark – to the extent that the doors of the two cars were interchangeable). Today Chery is one of China’s largest automakers and the largest Chinese automobile exporter. Since then, other cases of counterfeiting have emerged, such as a car that directly copied a Chevrolet compact.

As the Commission noted in its March 2011 research report “Ready for Takeoff,” the Chinese government has attempted to leverage airliner purchases in exchange for agreements that it hopes will lead to technology transfers into China’s aviation industry. Foreign firms have played an important role in the development of China’s capabilities in these areas. Partnerships in technological areas of particular importance to the Chinese, such as aircraft engines and composite materials manufacturing techniques, have received priority. For example, last year the Commission received testimony that, soon after making a \$10 billion order to import 150 Airbus A320s, China approached Airbus seeking that an assembly line be built in China. Shortly thereafter, Airbus set up a joint venture company to assemble the A320 in Tianjin. An Airbus spokesman acknowledged the developments as a quid pro quo.<sup>3</sup> In another example of technology transfer in the aviation industry, the state owned Commercial Aircraft Corporation of China (COMAC) made it clear that foreign bidders on the C919 program, a narrow-bodied jetliner intended to compete against Airbus A320 and the Boeing 737, are expected to form joint ventures with Chinese partners, especially in high-technology areas such as advanced materials and flight control systems, where Chinese technology is lagging. Every C919 contract awarded to a foreign bidder has been awarded to a joint-venture entity. Companies that do not provide access to coveted technologies or that are perceived to compete against domestic producers are not likely to receive preferential treatment and may indeed face severe obstacles. Given the close integration of China’s commercial and military aviation sectors, technology in the aviation sector has strategic implications.

In addition to joint ventures, there are other subtle impediments to market access that may force technology transfer. First, the Chinese government continues to interfere directly or indirectly in technology licensing negotiations between foreign patent holders and Chinese users. This is of particular concern in the communications sector. Such interference reportedly can lead to dissemination of sensitive information during the negotiation process. Second, the government is developing a series of indigenous, mandated standards for 4G and other information technologies, with very little input from foreign companies. In the future, it is possible that foreign companies may be forced to reveal sensitive information to comply with these standards. Finally, technology transfer is already being “forced” in some cases through conformity assessment; according to the United States Information Technology Office (USITO), “some of China’s [product] certification programs require disclosure of unnecessary information, much of which is confidential”, such as source code and design information.<sup>4</sup>

Some U.S. companies are able to benefit by transferring select technology; however, Chinese government policies have a net negative effect on the U.S. economy. The U.S. Chamber of Commerce, for example, said the following about China’s innovation policy: “[It r]estricts the ability of American

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<sup>3</sup> U.S.-China Economic and Security Review Commission, *Hearing on Chinese State-owned Enterprises and U.S.-China Bilateral Investment*, prepared Statement of Dr. Theodore H. Moran, March 30, 2011.

<sup>4</sup> United States Information Technology Office, *Written Comments to the U.S. Government Interagency Trade Policy Staff Committee in Response to Federal Register Notice Regarding China’s Compliance with its Accession Commitments to the World Trade Organization (WTO)* (Washington, DC: September 2012), p.18.

companies to access the market and compete in China and around the world by creating advantages for China's state-owned enterprises and state-influenced champions, [and has] the potential to undermine significantly the innovative capacity of the American economy in key sectors [and] harm the competitiveness and livelihood of American business and the workers that they employ." Of some 300 U.S. businesses surveyed by the American Chamber of Commerce in China last year, one in three acknowledged that either they or their clients have been negatively impacted by forced technology transfer requirements. Over half stated that the problem of forced technology transfer is either increasing (27 percent) or staying the same (24 percent).

The U.S. government has also raised this issue with China a number of times in recent months, including:

- at the US-China Joint Commission on Commerce and Trade (JCCT) meeting last November;
- in February during Vice-President Xi Jinping's visit to the United States;
- at the US-China Strategic and Economic Dialogues in February and May; and
- in June when the U.S. WTO ambassador Angelos Pangratis told the World Trade Organization (WTO) that forced technology transfer in China is a continual problem.

## **GOVERNMENT PROCUREMENT**

Forced technology transfer also occurs through the Chinese government's procurement of goods and services. In 2009, the official value of China's public procurement market surpassed \$100 billion, according to Chinese statistics from the Ministry of Finance, ranking it among the largest in the world. This measure probably understates its true size, because it excludes most government infrastructure projects and procurement by state-owned enterprises. For example, the EU Chamber of Commerce in China estimated that the procurement market was actually worth as much as \$1 trillion in 2009, about ten times the official figure. This would be equivalent to nearly 20 percent of China's economy; in the United States in 2008, the ratio of general government and state-owned utilities procurement to GDP was just over 10 percent.

China has not acceded to the voluntary WTO Agreement on Government Procurement (GPA), which pledges signatories to refrain from discriminating against foreign goods and services in government procurement. Although China agreed in 2001 to accede "as soon as possible", its first bid was only submitted in February 2008. Because the terms of accession that China offered did not satisfy other WTO members, China subsequently submitted two more bids, the latest in November of last year. Three bids are generally the maximum required for GPA applicants; yet several obstacles make China's imminent accession unlikely. First, China employs a very narrow definition of government procurement, as per its 2002 Government Procurement Law (GPL). This definition excludes large swaths of the state sector; uses a positive list approach (i.e. a product catalogue) to limit the types of products covered; and sets very high thresholds to limit the types of transactions that fall under procurement law. Of special concern is the limited coverage of state entities – including many state-owned enterprises and sub-central government units – because the state sector is the primary source of fixed asset investment in China. Second, the Chinese government is likely not particularly eager to join the GPA. It is neither attracted by reciprocal access to much smaller procurement markets, nor deterred by the limited repercussions it faces if it does not join. As a result, Beijing has not invested much political capital in the GPA negotiations: rather than an intra-ministerial negotiating team, it has designated the Ministry of Finance (MOF) as chief negotiator. MOF has neither the requisite experience to conduct WTO negotiations, nor the capacity to align the interests of powerful state-owned enterprises and government bodies. Finally, the GPA was designed for market economies where government

procurement is clearly delineated. Even if China were to accede to the GPA, the size and opacity of its government procurement market would seriously challenge the adjudication capacities of the WTO.

Without the constraints of the GPA, the Chinese government has introduced restrictive procurement laws. In 2009, Beijing issued the Circular on Launching the National Indigenous Innovation Product Accreditation Work, which required companies to file applications to be considered for accreditation as “indigenous innovation products” eligible for procurement. Under this policy, foreign-invested enterprises are expected to file for patents and copyrights within China in order to qualify for preferential treatment in government contracting or public work projects. The impetus to register local patents is also being reinforced by the rising number of utility model patents issued in China. While such patents are used throughout the world to establish intellectual property for product and process modifications, they are subject to less rigorous and expensive review processes in China. As a result, China ranked first in utility model applications in 2010, accounting for over four-fifths of the global total. Utility model patent holders in China can act as “patent trolls”, using patents as a ploy to either exclude foreign competitors or to justify intellectual property theft. Finally, due to poor intellectual property rights enforcement in China, any attempt to qualify a foreign affiliate for the official procurement catalogue would likely require foreign companies to transfer or reveal sensitive and proprietary technology to Chinese companies.

Concerns about these policies have been raised multiple times, including:

- In December 2009, the heads of 34 U.S., European, and Japanese companies and business associations wrote to Chinese leaders to protest national indigenous innovation catalogues.
- In a January 2010 letter to senior Obama Administration officials, the heads of 19 U.S. business and industry associations cautioned against “[s]ystematic efforts by China to develop policies that build their domestic enterprises at the expense of U.S. firms and U.S. intellectual property.”
- The U.S. Trade Representative’s (USTR) 2009 Report to Congress on China’s WTO Compliance noted a “growing concern” among U.S. businesses and industries that “the pace of economic reform in China appears to have slowed in key sectors, and there are growing indications that China’s movement toward a market economy has stalled.”
- A 2009 report by the U.S. Chamber of Commerce said that “the [indigenous innovation] plan is considered by many international technology companies to be a blueprint for technology theft on a scale the world has never seen before.”

In January 2011, President Hu Jintao attempted to allay the worries of foreign businesses and governments by pledging to revise the indigenous innovation policy. Five months later, the Chinese government issued a notice on behalf of all agencies, effective July 1, to revoke key measures linking government purchases to procurement catalogues. The notice was promptly reissued by provincial-level branches of the Ministry of Finance. However, the notice did not automatically nullify indigenous innovation measures instituted independently by provincial governments. For example, China’s government records indicate that Beijing terminated its local indigenous innovation measures in September 2011; Jiangsu province in December 2011; and Tianjin in June 2012. In comments filed with the Office of the U.S. Trade Representative in September 2012, the USITO found that “some provincial and local governments [in China] continue to implement various government procurement policies that favor products developed with local IP, or even products with IP from a particular province or municipality, over foreign ones.” The central government appears to be aware of the problem: in November 2011, it issued an internal circular to “deepen” the delinking of innovation policies from procurement. But when the Ministry of Finance published measures in June 2012 to standardize

procurement practice among local governments, it made no mention of problems with indigenous innovation measures.

In parallel to inconsistent enforcement at the sub-national level, the commitment to delinking procurement from indigenous innovation is also questionable at the central level. Product catalogues have not been completely eliminated – the Ministry of Industry and Information Technology (MIIT) recently came out with a catalogue for sub-ministerial vehicle procurement. Moreover, in February of this year, the Ministry of Finance issued the *Key Points for Government Procurement Work Plan*, which includes a 50 percent domestic content requirement. To comply with this requirement, foreign companies will almost certainly relocate more production to China, which enhances the risk of technology transfer.

### **SUBSIDIES AND TAX BREAKS**

In addition to market access and eligibility for government procurement, subsidies and tax breaks serve as a third form of inducing technology transfer. Several fiscal policies illustrate this. First, Beijing maintains a 150 percent tax deduction for foreigners who make qualified research and development expenditures in China. Second, although foreign-invested enterprises now pay the same statutory income tax as domestic firms (25 percent), they can pay a lower effective tax if they transfer technology. Specifically, the first 5 million RMB of income earned in a taxable year from transferring ownership of technology is exempted from the Enterprise Income Tax, and any excess amount is allowed to be taxed at one-half the normal 25 percent rate. The preferential tax rate of 15 percent applicable to eligible “high and new technology” enterprises is retained, but only if they receive priority support from the state and possess substantial or key ownership of core proprietary intellectual property rights.<sup>5</sup>

### **CONCLUSION**

Technology plays an important role in our economy. It is vital to our national security, but it also makes an excellent target for opportunistic competitors. As companies continue to transfer technology to China, many will face increased competition and pressure from Chinese firms. They may even find that they are excluded from a large part of China’s market that they had hoped to gain access to, and that they would have access to if trade with China adhered to international norms. Instead of the reciprocal trade relationship that we should have with a WTO partner, China’s conditioning access to their markets on the transfer of technology results in the loss of American jobs and harms the American economy. China’s commitment to remove indigenous innovation from government procurement catalogues requires continued monitoring by the U.S. government.

As the Commission explained in its 2011 Report to Congress, the Commission believes that the administration should press for a more reciprocal trading relationship in critical areas, such as intellectual property protection and market access. The United States should demand the same level of treatment from its major trading partners that it provides to them. The administration should identify those sectors that China has failed to open up to trade in goods and services, and the practices that act to nullify and impair anticipated economic benefits for U.S. producers and service providers. The

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<sup>5</sup> U.S.-China Economic and Security Review Commission, *Annual Report 2011* (Washington, D.C.: November 2011), p.52.



administration should then seek the elimination of such practices in a timely manner and, if unable to gain sufficient market access, evaluate what reciprocal actions may be appropriate.

The United States government should also work to employ multilateral pressure on China. In the past, Beijing has been willing to change course when facing pressure from multiple governments or when foreign governments and the private sector speak forcefully with one voice. We would likely find willing international partners in such an effort as China's technology transfer requirements are not a problem just for the United States. In July 2010, two of Germany's most prominent industrialists criticized the business and investment climate in China during a meeting with Chinese Premier Wen Jiabao. Jurgen Hambrecht, chairman of BASF, complained of foreign companies facing the "forced disclosure of know-how" in order to do business in China. "That does not exactly correspond to our views of a partnership," he said. In addition, Peter Loscher, chief executive officer of Siemens, said foreign companies operating in China "expect to find equal conditions in the fields of public tenders," referring to China's controversial procurement practices. He called on Beijing to rapidly remove trade and investment restrictions in sectors such as automobiles and financial services.

Chairman Broun, Ranking Member Tonko, thank you for allowing me to appear before you today. I appreciate the Subcommittee's focus on this important issue and I look forward to your questions.

### China's Investment Catalogue Revisions Compared: 2007 vs. 2011

Sub-Sectors	2007		2011	
	Number	Share of 2007	Number	Share of 2011
Encouraged	350	74.6%	354	74.8%
Restricted	86	18.3%	79	16.7%
Prohibited	33	7.0%	40	8.5%
<b>TOTAL</b>	<b>469</b>		<b>473</b>	

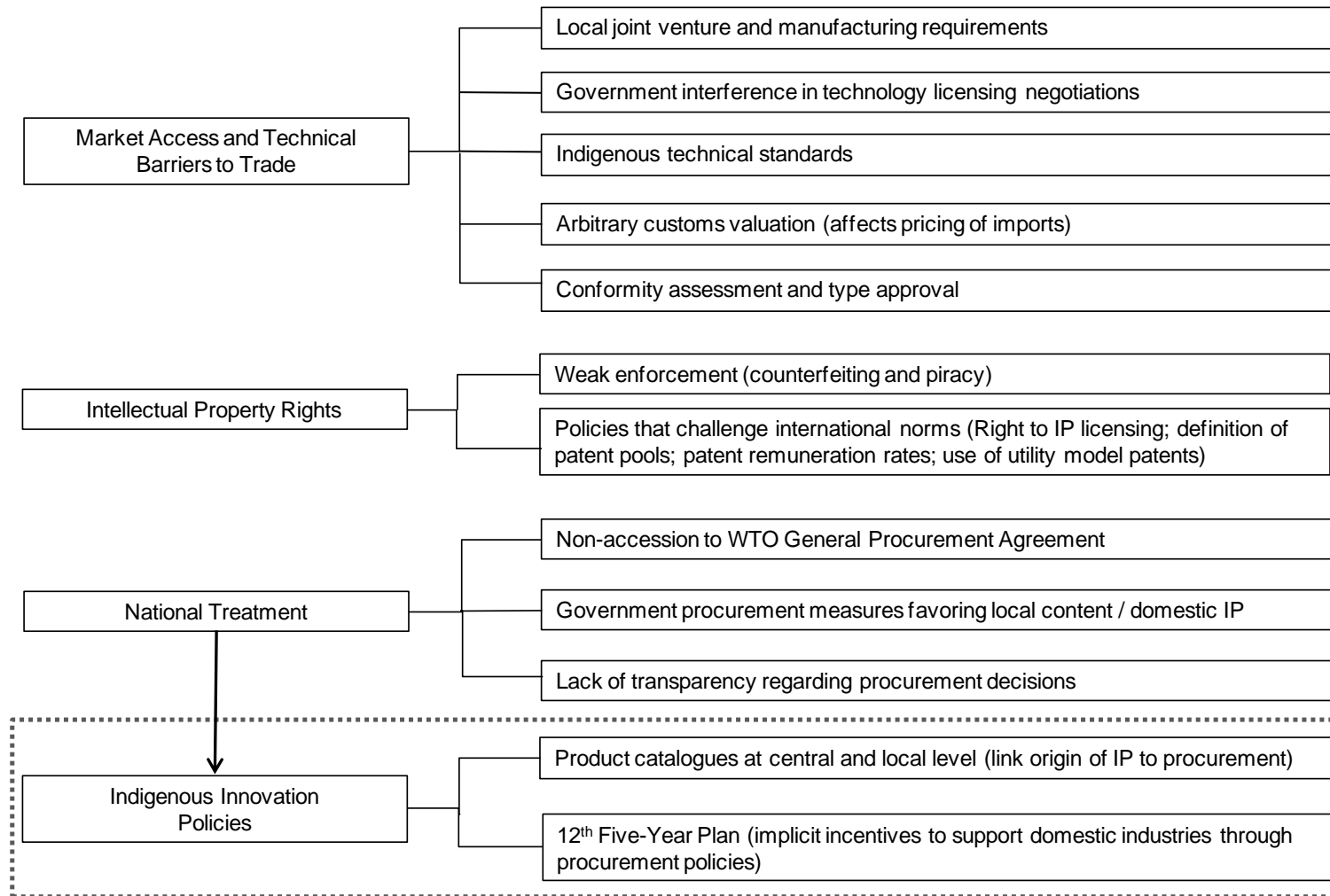
Source: Adapted from China's Ministry of Commerce

### A Breakdown of China's 2007 Investment Catalogue: Classification and Ownership Requirements

	Sector	Encouraged Industries		Restricted Industries		Prohibited Industries	Total
		Without ownership requirement	With ownership requirement	Without ownership requirement	With ownership requirement		
	<b>TOTAL</b>	<b>293</b>	<b>57</b>	<b>49</b>	<b>37</b>	<b>33</b>	<b>469</b>
1	Agriculture, Forestry, Animal Husbandry and Fishery Industries	11	1	1	2	3	18
2	Culture, Sports and Entertainment	1	1	1	4	11	18
3	Education	0	1	0	1	1	3
4	Finance Industry	0	0	1	4	0	5
5	Health, Social Security and Community Welfare	1	0	0	1	0	2
6	Leasing and Commercial Services	2	1	2	1	1	7
7	Manufacturing Industry	244	37	30	8	8	327
8	Mining and Quarrying Industries	3	6	5	3	3	20
9	Production & Supply of Electricity, Gas and Water	6	1	1	1	0	9
10	Real Estate Industry	0	0	2	1	0	3
11	Scientific Research, Technical Services and Geological Exploration	14	0	1	2	2	19
12	Transportation, Warehouse Management and Postal Services	7	7	3	4	2	23
13	Water Conservancy, Environment and Public Utility Management	2	2	0	1	2	7
14	Wholesale and Retail Business	2	0	2	4	0	8

Source: Adapted from China's Ministry of Commerce

## An Overview of “Forced” Technology Transfer Issues in China



Source: Adapted from USITO

### Utility Model Applications for the Top-15 Offices, 2010

Office	Application Year				
	2008	2009	2010	Share of total (%) 2010	Growth (%): 2009-10
Total	313,000	399,000	496,000	100.0	24.3
<b>China</b>	<b>225,586</b>	<b>310,771</b>	<b>409,836</b>	<b>82.6</b>	<b>31.9</b>
Germany	17,067	17,306	17,005	3.4	-1.7
Republic of Korea	17,405	17,144	13,661	2.8	-20.3
Russian Federation	10,995	11,153	12,262	2.5	9.9
Ukraine	9,600	9,205	10,685	2.2	16.1
Japan	9,452	9,507	8,679	1.7	-8.7
Turkey	2,992	2,882	3,033	0.6	5.2
Spain	2,682	2,560	2,640	0.5	3.1
Italy	2,200	2,307	2,456	0.6	6.5
Brazil	3,218	3,122	1,988	0.4	-36.3
Czech Republic	1,183	1,382	1,608	0.3	16.4
Australia	1,255	1,320	1,465	0.3	11.0
Thailand	1,515	1,467	1,328	0.3	-9.5
Belarus	967	1,119	1,089	0.2	-2.7
Poland	719	780	945	0.2	21.2
Others	6,164	6,975	7,320	1.5	4.9

Source: Adapted from World Intellectual Property Organization

This is in reference to utility model patents. See page 7 paragraph 2 of testimony.