

## SECTION 3: CHINA'S 13TH FIVE-YEAR PLAN

### Introduction

The 13th Five-Year Plan (FYP)\* (2016–2020)—ratified by the National People's Congress in March 2016—established Chinese President and General Secretary of the Chinese Communist Party (CCP) Xi Jinping's vision for China's development over the next five years. This plan largely reiterates commitments from the 11th (2006–2010) and 12th (2011–2015)† FYPs to reorient the drivers of China's economy away from large-scale infrastructure investment and export-led growth toward greater domestic consumption. Addressing China's structural challenges and ensuring long-term prosperity are critical to preserving the CCP's legitimacy and hold on power. However, the Chinese government's ability to reach these objectives depends on its willingness to relinquish a substantial degree of state control, overcome entrenched interests, and endure the short-term and medium-term economic pain that structural reform creates.

The CCP and Chinese government view the state as a key part of the solution, not the problem.<sup>1</sup> Thus, for the Chinese government, reform means retaining or strengthening state control while attempting to increase the efficiency of state-owned enterprises (SOEs) and state-designated industries—a contradiction of fundamental free market principles. With slowing growth, the Chinese government faces even greater difficulty balancing its competing priorities: long-term, sustainable growth versus short-term economic growth. Whether the 13th FYP reforms will be implemented is not an economic question but a political one. The Chinese government risks instability if it implements reforms too quickly, but risks falling into the middle-income trap‡ if reforms are implemented too slowly or not at all.<sup>2</sup> The middle-income trap would ensnare the Chinese economy in a cycle of low growth because rising

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\* FYPs are overarching roadmaps that lay out the central government's top policy objectives and establish measurable targets for government performance to guide government ministries' and local governments' behavior. The broad FYP is then followed by a cascade of local government, ministerial, and industry plans that outline in greater detail how the Chinese government will achieve these objectives. For a detailed analysis of China's five-year planning system, see Sebastian Heilmann and Oliver Melton, "The Reinvention of Development Planning in China, 1993–2012," *Modern China* 39:6 (August 2013): 580–628; U.S.-China Economic and Security Review Commission, *Hearing on China Ahead of the 13th Five-Year Plan: Competitiveness and Market Reform*, written testimony of Oliver Melton, April 22, 2015.

† For analysis of the 12th FYP, see Joseph Casey and Katherine Koleski, "Backgrounder: China's 12th Five-Year Plan," *U.S.-China Economic and Security Review Commission*, June 24, 2011.

‡ The middle-income trap is an economic development situation where a rapidly developing, low-income economy reaches middle-income status (\$10,000–\$16,000 per capita), but then growth slows, preventing the country from reaching high-income status. According to analysis by the World Bank, only 13 of the 101 middle-income economies in 1960 reached high income by 2008. These economies are Equatorial Guinea, Greece, Hong Kong, Ireland, Israel, Japan, Mauritius, Portugal, Puerto Rico, South Korea, Singapore, Spain, and Taiwan. Greg Larson, Norman Loayza, and Michael Woolcock, "The Middle-Income Trap: Myth or Reality?" *World Bank Malaysia Hub*, March 2016. 1: 104230.

wages would make its manufacturing sector uncompetitive against low-cost countries, but high-value-added manufacturing is not yet fully developed. The Chinese government's reluctance to press ahead with necessary reforms doomed similar efforts under the 11th and 12th FYPs.<sup>3</sup> Beyond political will, the costs to meet the 13th FYP's goals are high; based on Chinese government estimates, achieving the objectives for urbanization, healthcare, clean energy, emissions reduction, and environmental remediation is expected to cost around \$8.1 trillion (renminbi [RMB] 54 trillion) in public and private sector investment over the next five years.<sup>4</sup> It remains unclear how these objectives will be funded, especially as local governments are overburdened by debt taken on during the 12th FYP and incentives for private sector investment remain limited.

Building on the Commission's decade-long examination of China's industrial policies, expert testimony received at the Commission's April 27 hearing, the Commission's June trip to China (Beijing and Kunming), and additional contracted\* and staff research, this section examines the 13th FYP and assesses its impact on U.S. economic and security interests.

### **China's 13th FYP: Blueprint for 2016–2020**

China's state-led economic model created nearly three decades of double-digit growth at the cost of severe environmental degradation and overinvestment in infrastructure and state-designated industries. Cheap labor is now drying up, forcing firms to seek higher profits by moving up the value-added chain or transferring production to lower-cost provinces in central and western China or abroad. Meanwhile, a slower global economy is not able to absorb ever more Chinese exports, necessitating the expansion of domestic consumption as a new engine of economic growth.<sup>5</sup> President Xi laid out ambitious reforms first in the Third Plenary Session of the CCP's 18th Central Committee † (Third Plenum), followed by more concrete targets in the 13th FYP to address this unsustainable growth model (for a list of key targets in the 13th FYP, see Addendum I).‡

The 13th FYP seeks to address China's "unbalanced, uncoordinated, and unsustainable growth" and create a "moderately prosperous society in all respects" § through innovative, open, green, co-

\* For a comprehensive analysis of China's state-directed plans, see Tai Ming Cheung et al., "Planning for Innovation: Understanding China's Plans for Technological, Energy, Industrial, and Defense Development," *University of California Institute on Global Conflict and Cooperation* (prepared for the U.S.-China Economic and Security Review Commission), July 28, 2016.

† For an in-depth analysis of the Third Plenum's proposed economic reforms, see Nargiza Salidjanova and Jacob Koch-Weser, "Third Plenum Economic Reform Proposals: A Scorecard," *U.S.-China Economic and Security Review Commission*, November 19, 2013.

‡ For an in-depth analysis of the targets in China's 13th FYP, see Katherine Koleski, "13th Five-Year Plan," *U.S.-China Economic and Security Review Commission*, forthcoming.

§ The term "moderately prosperous society" was first put forward as an objective in the 16th National Congress of the CCP in 2002 and reiterated at the 17th National Congress in 2007. At the 18th National Congress in 2012, President Xi expanded the definition to address economic, political, cultural, social, and ecological aspects, and this overarching goal forms the basis for the 13th FYP. Key aspects of this goal include: (1) achieve the two centenary goals of doubling China's 2010 gross domestic product (GDP) and average disposable income level by 2021, (2) expand Chinese citizens' participation and enhance law-based governance, (3) strengthen China's cultural soft power, (4) reduce poverty and income disparity and expand access to basic public services, and (5) improve the living environment for all Chinese citizens and shift toward more environmentally friendly development. Qiu Shi, "Building a Moderately Prosperous Society in All Respects: A Crucial Step for Realizing the Chinese Dream," *Qushi Journal* 7:4 (December

ordinated, and inclusive growth.<sup>6</sup> It restates the Chinese government's commitment to rebalance the economy to one based on higher-value-added manufacturing and domestic consumption. In a meeting with the Commission in Beijing, a Chinese official explained that the 13th FYP focuses on innovation, SOE reform, and development of human capital through prioritizing environment, health, education, and social welfare.<sup>7</sup> But while the 13th FYP's reforms introduce market drivers into allocating capital and resources, the plan also reinforces the central roles of the CCP and Chinese government in China's economic and social development.<sup>8</sup> The 13th FYP creates a blueprint for China's future development based around five key themes:

- *Innovation*: The 13th FYP emphasizes innovation as a cornerstone of China's development strategy. The Chinese government is redoubling its state-directed strategy started under the 12th FYP to increase investment in research and development (R&D), create technology clusters,\* incentivize foreign direct investment in select industries, and boost market demand for Chinese products and firms through government procurement and customer incentives.<sup>9</sup> "Indigenous innovation," an initiative strongly condemned by U.S. and other foreign governments and firms upon its inclusion in the 12th FYP,† is included in the 13th FYP.<sup>10</sup> U.S. and other foreign governments and firms believe this initiative inherently discriminates against U.S. and other foreign firms by seeking to replace foreign technology with products and services from Chinese firms, and signals the Chinese government's push toward technological self-sufficiency.<sup>11</sup>
- *Open trade*: The 13th FYP hopes to expand exports, increase outbound and inbound investment, promote the international use of the RMB, and enhance China's role in global economic governance. The creation of the Beijing-Tianjin-Hebei megaregion,‡ the Yangtze Economic Belt, and the "One Belt, One Road"§ initiative are all important contributors to this goal. The 13th FYP attempts to boost exports with faster processing of export tax rebates, expansion of cross-border e-commerce, expansion of free trade zones, and support of trade in

15, 2015): 25; John Ross, "Moderately Prosperous Society' Is Key Goal for China," *China Internet Information Center*, November 14, 2012.

\*The Chinese government incentivizes the geographic concentration of related organizations, institutions, and domestic and foreign companies of a particular industry through tax rebates, customs duties and value-added tax exemptions, or refunds for R&D purchases in order to facilitate the transfer of technology, create synergies with domestic firms, and expand foreign high-technology R&D operations. McKinsey Global Institute, "The China Effect on Global Innovation," *McKinsey and Company*, October 2015, 106, 116–117.

†For an overview of foreign firms' concerns regarding indigenous innovation, see James McGregor, "China's Drive for 'Indigenous Innovation': A Web of Industrial Policies," *American Chamber of Commerce*, 2010.

‡A megaregion is a clustered network of metropolitan areas and their suburbs that share transportation, economic growth patterns, history, and natural resources. U.S. Department of Transportation, Federal Highway Administration, "Role of Regional Planning Organizations in Transportation Planning across Boundaries," October 20, 2015.

§For more information on the Silk Road Economic Belt, see U.S.-China Economic and Security Review Commission, Chapter 3, Section 1, "China and Central Asia," in *2015 Annual Report to Congress*, November 2015, 391–418; for more on the 21st Century Maritime Silk Road, see U.S.-China Economic and Security Review Commission, Chapter 3, Section 2, "China and Southeast Asia," in *2015 Annual Report to Congress*, November 2015, 448–449.

services. The 13th FYP pledges to loosen foreign investment restrictions in select sectors such as elder care, banking, and finance, and encourage imports of advanced technology and equipment and high-quality consumer products, reflecting China's industrial and economic goals. The 13th FYP also outlines a greater role for China in driving the international economic agenda through the pursuit of bilateral and multilateral free trade agreements and formulation of international standards for the Internet, deep-sea exploration, the Arctic and Antarctica, and space.<sup>12</sup>

- *Green growth:* The Chinese government strengthens the 12th FYP's efforts to address China's severe environmental degradation and build its clean energy, green manufacturing, and environmental services sectors. Ten out of the 25 priority targets in the 13th FYP are related to the environment, and all ten are included as part of the 13th FYP's 13 binding\* targets that must be achieved by 2020. These targets establish caps for energy use and ambitious goals for city air quality, carbon dioxide intensity, and reduction of soil and water contamination.<sup>13</sup>
- *Coordinated development:* Coordinated regional development aims to address the widening disparities in regional economic development, redundant construction, duplication of industrial structures, and lack of public services through urbanization, reform of the household registration system, or *hukou*,<sup>†</sup> and the creation of the Beijing-Tianjin-Hebei megaregion and the Yangtze Economic Belt.<sup>14</sup> The Chinese government is hoping that greater intergovernmental coordination of policies, resources, and urban planning in these megaregions will unleash new sources of economic growth and alleviate existing urban problems such as overpopulation, pollution, traffic, and high real estate costs.<sup>15</sup>
- *Inclusive growth:* The 13th FYP expands upon the 12th FYP's concept of a "harmonious society" to pursue "inclusive growth" for all Chinese citizens by alleviating poverty, raising standards of living, improving accessibility to and affordability of education and healthcare services, and creating urban jobs for a broad cross-section of rural citizens.<sup>16</sup> Greater urbanization, higher-value-added manufacturing, hukou reform, and environmental reforms are selected by the 13th FYP as important contributors to these objectives.

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\* FYPs classify their key targets into binding or expected. Binding targets are incorporated into the CCP's evaluation criteria at every level, while expected targets (such as GDP growth) are either given less weight or not included in the CCP evaluation criteria. U.S.-China Economic and Security Review Commission, *Hearing on China Ahead of the 13th Five-Year Plan: Competitiveness and Market Reform*, written testimony of Oliver Melton, April 22, 2015, 5.

† The hukou establishes eligibility for education and access to government services for all Chinese citizens based on the status of one's parents and place of birth. The holder of a given hukou can only receive government services and benefits where they are registered, particularly disadvantaging the 260 million rural residents who have migrated to cities.

## Urbanization

The 13th FYP continues the government's efforts to reduce the economic disparity between urban and rural residents and spur consumption and economic growth by creating a new consumer base and expanding the middle class.<sup>17</sup> Under the 12th FYP, sustained urbanization efforts increased the share of the population living in urban areas from 47.5 percent in 2010 to 56.1 percent in 2015, and produced more than 64 million urban jobs in five years.<sup>18</sup> Under the 13th FYP, the goal is to raise urbanization levels to 60 percent and create more than 50 million urban jobs by 2020.<sup>19</sup>

In his testimony before the Commission, Damien Ma, fellow at the Paulson Institute, noted that the Chinese government is seeking to make urbanization more "people centered" through revitalization of urban slums, construction of urban housing, and expansion of urban hukou in second- and third-tier cities.<sup>20</sup> Government subsidies were used to build over 40 million affordable urban housing units in 2011–2015.<sup>21</sup> The *National Plan on New Urbanization* (2014–2020) incentivizes rural migration to third- and fourth-tier cities by making it easier to obtain hukou there for 100 million migrants and providing affordable housing for 100 million current residents through the renovation of "rundown urban areas."<sup>22</sup> The 13th FYP restates the Chinese government's commitments to hukou reform and pledges to renovate 20 million residential units in rundown urban areas by 2020.<sup>23</sup> In addition, the 13th FYP intends to more effectively coordinate regional government policies within existing megaregions around Beijing and Shanghai; integrate intercity regional air, car, rail, and sea transportation networks; and reconfigure regional industry layouts.<sup>24</sup>

But simply urbanizing will not create higher wages and boost consumption. The Chinese government will need to create millions of higher-paying jobs and expand access to public services in order to raise prosperity, boost domestic consumption, and accelerate economic growth. Approximately 6.5 million Chinese students graduate from college each year, but many are unable to find a job that matches their credentials or salary demands.<sup>25</sup> As Gordon Orr, senior advisor to the management consulting firm McKinsey & Company, explained, recent Chinese graduates face limited job prospects, low job security, and low-income jobs.<sup>26</sup>

Municipal governments require new sources of financing to afford the expected surge in demand for urban infrastructure and public services. The Ministry of Finance estimates urbanization will require \$6.3 trillion (RMB 42 trillion) of financial support from 2014 to 2020, and the Ministry of Transportation and the National Development and Reform Commission announced they will spend \$701.5 billion (RMB 4.7 trillion) on 303 infrastructure projects in 2016–2018.<sup>27</sup> Weiping Wu, professor and chair of the Department of Urban and Environmental Policy and Planning at Tufts University, testified to the Commission that municipal governments are exploring public-private partnerships (PPPs), municipal bonds, and private investment to bridge the gap.<sup>28</sup> Dr. Wu highlighted water and wastewater treatment facilities, renewable energy projects, airports, and toll roads as potential areas for PPPs.<sup>29</sup> In April 2014,

the State Council pledged to open 80 major public infrastructure projects to private and foreign investment.<sup>30</sup> Nevertheless, Dr. Wu cautioned that while the Chinese government at all levels is heavily promoting PPPs, implementation is difficult. For example, she noted that demand for water, wastewater, and heating trunklines remains strong, but the irregular and relatively low cash flows from such projects, fragmented central-local legal and administrative decision making, and lack of enforceable dispute resolution systems in PPPs are not attractive to private domestic and global partners.<sup>31</sup> According to the Ministry of Finance, only 39 percent of the more than 600 PPP projects implemented in the first half of 2016 have private business partners,<sup>32</sup> signaling that greater incentives are needed to make PPPs viable.<sup>33</sup>

### ***Hukou Reform***

The 13th FYP reaffirms plans—originally laid out in the Third Plenum and detailed in the Fifth Plenum—to reform the hukou system.\* Around 260 million rural residents have migrated to urban areas over the last three decades in pursuit of higher-paying jobs, but have been largely left out of the urban social insurance system, which includes pension and unemployment insurance, due to the hukou regime.<sup>34</sup> This has created “two different types of citizenship,” according to Dr. Wu, where urban hukou holders enjoy privileged access to the most stable employment, high-quality education, and public services, while many rural hukou holders do not.<sup>35</sup> Based on the 2005 One Percent Population Survey (latest available),† Dr. Wu found only 12.7 percent of rural migrants in Beijing and Shanghai obtained pension benefits compared with 85.5 percent of local urban residents.<sup>36</sup> In addition, the hukou restricts rural migrants’ access to urban public housing, public services, and better-quality schools; one consequence of hukou has been that over 60 million children in rural areas have been left behind with grandparents or on their own as their parents moved to urban areas for work.<sup>37</sup> Education is a key factor in determining job prospects and social mobility. Rural students graduating from overcrowded, academically weaker, and poorer rural schools are at a disadvantage when competing for seats in universities against better-prepared urban students, who are able to afford high school education and the additional tutors they need to do well on their university entrance exams.<sup>38</sup>

The 13th FYP seeks to address these disparities in education and earnings while enhancing labor productivity and domestic consumption by increasing the share of the population registered as permanent urban residents from 39.9 percent in 2015 to 45 percent in 2020.<sup>39</sup> Yet, municipal governments remain unwilling to take on the significant financial burden of adding millions of migrants to their public services and education systems.<sup>40</sup> According to a 2010 survey by the State Council’s Research Development Center, the

\* For more information on China’s social and housing reforms, including discussion of China’s unregistered population, see U.S.-China Economic and Security Review Commission, *Monthly Analysis of U.S.-China Trade Data*, January 6, 2015, 5–7.

† More recent data are not available. The 2010 census did not include questions related to social welfare, and results from the 2015 One Percent Population Survey have not yet been released. Weiping Wu, interview with Commission staff, August 15, 2016.

lifetime cost of bringing the estimated 260 million migrant workers and their families to the urban social service system would be around \$3.1 trillion (RMB 20.8 trillion).<sup>41</sup> In August 2016, the State Council announced it would create a national basic public service market to include services such as pension, healthcare, and compulsory education,<sup>42</sup> which would address some of these disparities and allow for greater portability of benefits, but it remains to be seen how this policy will be implemented.

Meanwhile, restrictions on migration to China's megacities and richer eastern provinces remain in place.<sup>43</sup> For example, Shanghai's 2016–2040 plan aims to keep the city's population at 25 million by 2040; in 2014, the number of residents totaled 24.3 million.<sup>44</sup> To control migration, Beijing,\* Shanghai, Guangzhou, and Tianjin—megacities with more than five million residents each—maintain a points system based on factors such as employment, housing, educational background, and skill level for migrants to earn those cities' hukou.<sup>45</sup> This system is, in effect, rigged against migrants, who are usually unable to meet the necessary qualifications.<sup>46</sup>

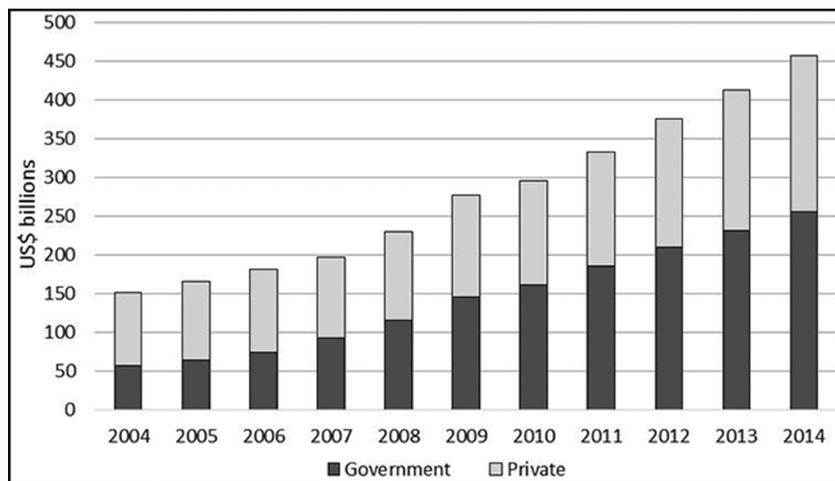
### **Healthcare**

The Chinese government is continuing efforts begun under the 12th FYP to create a high-quality, affordable, and accessible healthcare system.† From 2011 to 2015, the Chinese government successfully expanded its basic health insurance to provide near-universal coverage, but Dr. Wu cautioned this insurance covers only a limited number of services.<sup>47</sup> The Chinese government also spent \$1.3 trillion between 2008 and 2014 to bring down the share of Chinese citizens' out-of-pocket healthcare spending from 40 percent in 2008 to 32 percent in 2014.<sup>48</sup> However, soaring medical costs, overcrowding at large hospitals, and substandard care‡ remain key challenges.<sup>49</sup> Actual healthcare costs increased three-fold from \$150.3 billion in 2004 to \$456.9 billion in 2014, and are expected to continue to grow as the population ages (see Figure 1).<sup>50</sup> Based on a joint estimate from the World Bank, World Health Organization, and three Chinese government agencies, without reform, real healthcare expenditures will increase an average of 8.4 percent annually from \$526.7 billion (RMB 3.5 trillion) in 2015 to \$2.4 trillion (RMB 15.8 trillion) in 2035.<sup>51</sup>

\*In September 2016, Beijing Municipality stopped classifying residents within its municipality as urban or rural. This change affects 2.9 million residents, formerly classified as "rural," who live in surrounding towns and villages that have been subsumed by Beijing. Wang Su and Li Rongde, "Beijing Scraps Urban-Rural Hukou Distinction," *Caixin*, September 20, 2016.

†For more information on China's healthcare industry, see U.S.-China Economic and Security Review Commission, Chapter 1, Section 3, "China's Healthcare Industry, Drug Safety, and Market Access for U.S. Medical Goods and Services," in *2014 Annual Report to Congress*, November 2014, 127–171.

‡Interest in high-quality medical treatment has led a growing number of Chinese citizens to travel to the United States. For more information, see Matt Snyder and Nicole Stroner, "Chinese Tourism and Hospitality Investment in the United States," *U.S.-China Economic and Security Review Commission*, July 25, 2016. 10–12.

**Figure 1: China's Healthcare Expenditures, 2004–2014**

Source: World Health Organization, "Global Health Expenditure Database."

China has a high rate of tobacco use, with negative consequences for its public health: In 2011, 53.4 percent of Chinese men used tobacco, contributing to 30.1 percent of cardiovascular-related deaths in China.\* In addition, the increasing prosperity of Chinese citizens has contributed to a rise in so-called "diseases of affluence," such as high blood pressure and diabetes, whose treatment is not necessarily covered by basic health insurance.<sup>52</sup> As of 2015, 10.6 percent of all Chinese citizens lived with diabetes, and the costs of managing the disease totaled approximately \$51.1 billion.<sup>53</sup> These numbers could skyrocket if even a fraction of China's nearly 500 million people with prediabetes develop Type 2 diabetes.<sup>54</sup> Financing these expenditures has already put a strain on local governments, and the recent increases in central government transfers to local governments will not be enough to offset the mounting expenses.<sup>55</sup>

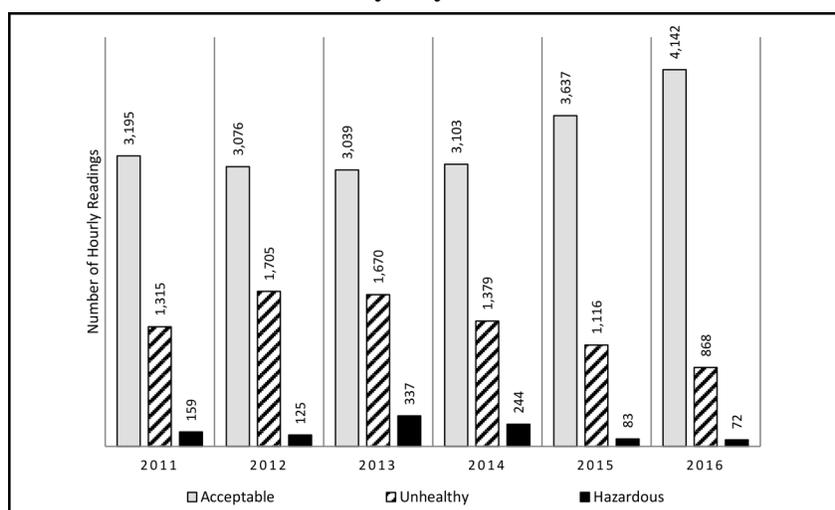
### China's Energy Sector and Environmental Reforms

The Chinese government is attempting to clean up the severe environmental degradation left by its "growth at any cost" strategy and shift toward a more sustainable economic model. Official reports found that approximately 20 percent of China's arable land, 10 percent of woodlands, 10.4 percent of grasslands, and 33 percent of surface water are polluted, and more than 80 percent of underground well water used by farms, factories, and households is too polluted to safely drink or bathe in.<sup>56</sup> Based on official Chinese data and independent research, the Chinese government largely met its 12th FYP targets for energy consumption and carbon and pollutant emissions reduction (see Addendum I for 12th FYP tar-

\*This study is based on data collected from 1991 to 2011 covering 26,000 people in nine provinces. Yanping Li, et al., "Potential Impact of Time Trend of Life-Style Factors on Cardiovascular Disease Burden in China," *Journal of the American College of Cardiology* 68:8 (2016): 818–833.

gets achieved).<sup>57</sup> Using satellite data from the National Aeronautics and Space Administration (NASA), 18 researchers from NASA, academia, and U.S., Canadian, and Dutch government and independent research institutes found that in eastern China, where most of China’s pollution is concentrated, sulfur dioxide levels fell around 60 percent between 2012 and 2015.<sup>58</sup> The researchers attributed this reduction to government efforts to meet 12th FYP emission targets, greater use of scrubbers in coal-fired power plants and industries, and the slowdown of China’s economy.<sup>59</sup> A comparison of hourly PM2.5\* data from the U.S. Embassy in Beijing for the first seven months of 2016 with the same period for the last five years shows the number of “acceptable” hours increased from 3,195 readings in 2011 to 4,142 readings in 2016, but hazardous air quality levels still occur (see Figure 2).<sup>60</sup>

**Figure 2: U.S. Embassy Hourly PM2.5 Readings in Beijing, January–July 2011–2016**



*Note:* The data are hourly readings of the micrograms of PM2.5 per cubic meter of air and cover January 1–July 31 of each year. The classification of these data is based on the U.S. Environmental Protection Agency’s *Guideline for Reporting Daily Air Quality—Air Quality Index*. In the figure, the “acceptable” category (0–100) includes readings designated “good” (0–50) and “moderate” (51–100) by the U.S. Environmental Protection Agency. The “unhealthy” category (101–300) includes “unhealthy for sensitive groups” (101–150), “unhealthy” (151–200) and “very unhealthy” (201–300) readings. The “hazardous” category, which describes any conditions likely to cause serious health effects, includes any readings beyond 301. In the first seven months of 2016, PM2.5 levels in Beijing reached a high of 782.

*Source:* U.S. Department of State, U.S. Embassy in Beijing, *Historical Data*. <http://www.stateair.net/web/historical/1/1.html>.

The 13th FYP expands these efforts to include water and soil decontamination due in part to rising public concerns over food and water safety.<sup>61</sup> Ten out of the 25 priority targets in the 13th FYP are related to the environment, and all ten are included as part of

\*PM2.5 is made up of metal, organic chemical, acid, soil or dust, and allergen particulates measuring 2.5 micrometers or smaller in diameter. Excessive exposure to PM2.5 aggravates existing heart and lung disease and is linked to higher incidences of heart attacks, asthma attacks, and bronchitis. U.S. Environmental Protection Agency, Basic Information.

the 13 binding targets that must be achieved by 2020.<sup>62</sup> Kevin Mo, managing director for climate and sustainable urbanization at the Paulson Institute, noted that “what’s exciting is that the government is taking an integrated approach, tackling air quality, climate change, and the development of a new model of growth together instead of treating them as separate issues.”<sup>63</sup> Meeting these targets will be critical to attaining China’s broad goal of a “moderately prosperous society in all respects,” noted a Chinese official to the Commission in Beijing.<sup>64</sup>

Although the Chinese government has dedicated significant funds and high-level attention to environmental degradation over the last several years, lax enforcement, competing policy objectives, and the high costs and technical difficulty of implementing soil and water decontamination remain key challenges.<sup>65</sup> Competition between economic growth and environmental protection objectives continues to undermine the Chinese government’s efforts to prevent and mitigate pollution.<sup>66</sup> Despite government emissions targets, emphasis on renewable energy, and existing overcapacity, central and western provinces are proceeding with the construction of new coal-fired power plants, one of the largest contributors to carbon emissions, with 210 new plants approved in 2015 and at least 55 more awaiting approval this year.<sup>67</sup>

### ***Enforcement***

In 2016, Premier Li Keqiang stressed strict enforcement of environmental standards—a key weakness of environmental efforts under the 12th FYP\*—stating that violators would be “severely punished.”<sup>68</sup> The Ministry of Environmental Protection has stepped up enforcement by creating “green teams” of environmental experts to randomly inspect provincial and municipal governments’ enforcement of environmental regulations and implementation of national environmental policies. Previously, only the Central Discipline Inspection Commission, China’s anticorruption agency, had the right to conduct such inspections.<sup>69</sup> These inspections are intended to hold local leaders accountable and ensure policy consistency across provinces.<sup>70</sup> Complementing these efforts, the Chinese government is expanding its continuous emissions monitoring systems for power plants and large firms.<sup>71</sup> In July 2016, the Ministry of Environmental Protection announced it will set up river and lake water quality monitoring stations in 338 prefecture-level cities† in 31 provinces; the stations will use 21 metrics to determine water quality.<sup>72</sup> Although there has been progress, Ma Jun, director of the China-based environmental non-profit Institute of Public and Environmental Affairs, cautioned “it is still not enough” because the fines are “still cheaper than the

\* For more information on energy conservation and environmental protection actions undertaken during the 12th FYP, see U.S.-China Economic and Security Review Commission, Chapter 1, Section 3, “China’s State-Led Market Reform and Competitiveness Agenda,” in *2015 Annual Report to Congress*, November 2015, 169–174; for more information on environment-related unrest, see U.S.-China Economic and Security Review Commission, Chapter 2, Section 3, “China’s Domestic Stability,” in *2014 Annual Report to Congress*, November 2014, 357–358.

† Prefecture-level cities are a government administrative classification that ranks below a province but above a county.

cost of compliance,” and polluting firms continue to enjoy significant local government support.<sup>73</sup>

### **Funding**

The scale of investment required to meet the Chinese government’s environmental priorities exceeds its available budget, and the government is exploring new avenues to attract private investors. An April 2015 report by more than 40 leading Chinese financial policy and regulation experts and government officials estimated that the Chinese government will only be able to fund between 10 to 15 percent of the estimated \$1.5 trillion (RMB 10 trillion) investment required over the next five years, including \$597 billion (RMB 4 trillion) in environmental protection, \$373.1 billion (RMB 2.5 trillion) for clean transportation, \$373.1 billion (RMB 2.5 trillion) for clean energy, and \$149.3 billion (RMB 1 trillion) for energy efficiency.\* And, costs could be much higher. Estimates by the Green Finance Committee of the China Society for Banking and Finance under the People’s Bank of China (PBOC) and Bloomberg Philanthropies in June 2016 found that Chinese cities will require \$985 billion (RMB 6.6 trillion) by 2020 just for energy-efficient buildings, clean transportation, and clean energy.<sup>74</sup>

Given the significant shortfall in funding by the central government, plans for fixing existing environmental damage are in essence an unfunded mandate imposed on provincial and local governments. For example, in 2016, the central government only allocated \$1.3 billion (RMB 9 billion) for soil remediation, a small fraction of the costs local governments are expected to bear.<sup>75</sup> Nanjing-based integrated securities firm Huaitai Securities estimated in April 2016 that soil remediation projects for the next five years will cost up to \$89.4 billion (RMB 590 billion); full remediation, where crops can be grown and livestock safely raised on formerly contaminated land, will cost an estimated \$1.1 trillion (RMB 7.4 trillion).<sup>76</sup>

To close the funding gap, the Chinese government hopes to entice domestic and international investment in green industries, pollution and climate change mitigation efforts, and environmentally friendly projects through PPPs and green financing.† Based on estimates from the State Council’s Financial Research Institute, green bonds‡ could finance approximately \$44.8 billion (RMB 300 billion) of China’s needed clean energy investment annually by 2020.<sup>77</sup> In the first half of 2016, China issued \$8.3 billion in RMB-denominated green bonds, accounting for roughly a quarter of the \$34.6

\*This estimate is based on the 12th FYP Environmental Protection Plan and the Ministry of Environmental Protection (final investment expected to exceed RMB 5 trillion under the 12th FYP), 2014 Plan on Water Pollution Prevention (RMB 2 trillion expected), 2014 Plan on Air Pollution Prevention and Control (RMB 1.7 trillion expected), China Railway Annual Report (RMB 800 billion allocated in 2014), Renewable Energy Policy Network (RMB 350 billion invested in 2013), and Bloomberg’s estimate of renewable energy investment (RMB 420 billion invested in 2012). People’s Bank of China and U.N. Environment Program, *Establishing China’s Green Financial System: Report of the Green Finance Task Force*, April 2015, 5.

†Green financing is a relatively new concept with no established definition. It can be broadly defined as financial investment in sustainable development projects, industrial pollution control, water sanitation, biodiversity protection, environmental products, etc. Nanette Lindenberg, “Definition of Green Finance,” *German Development Institute*, April 2014.

‡Green bonds are tradable debt securities issued by firms, governments, and international investors to finance climate-related or environmental projects. They were first issued by the World Bank in 2008. World Bank and Public-Private Infrastructure Advisory Facility, “What Are Green Bonds?” 2015, 23.

billion of global green bonds issued in that period.<sup>78</sup> It remains unclear, however, who buys these bonds.

Attracting additional funding requires greater transparency and clarity on the legal and regulatory frameworks governing PPPs and green financing, and further opening of the financial sector to global investors.<sup>79</sup> Green bonds are largely self-labeled by the issuer.<sup>80</sup> For example, the China Green Bond Index permits fossil fuel investments such as clean coal, while the voluntary 2016 Green Bond Principles, supported by 117 institutions (including one Chinese institution, the Agricultural Bank of China), do not.<sup>81</sup> In light of these differing definitions and practices, global investors are pushing for a standardization of definitions, reporting, and impact assessments to ensure investments are used for their intended purpose.<sup>82</sup> As the 2016 chair of the G20,\* China pushed for the global expansion of green financing through the establishment of international standards and guidelines, capacity-building for governments to set up green financing mechanisms and create local green bond markets, knowledge sharing for banks and institutional investors on environmental and financial risks, facilitation of investors and green finance across different countries' markets, and improvement in measuring green finance activities and their impact.<sup>83</sup> The 2016 G20 Summit highlighted the importance of green financing but provided few concrete steps forward,<sup>84</sup> signaling a lack of global consensus.

### China's Industrial Policies

Under the 13th FYP, the Chinese government seeks to accelerate China's transition to higher-value-added, intelligent manufacturing† by focusing on indigenous innovation and upgrading key emerging industries such as integrated circuits (ICs), biomedicines, cloud computing, and e-commerce.<sup>85</sup> In a 2016 report prepared for the Commission, University of California Institute on Global Conflict and Cooperation found that the Chinese government has “vigorously implemented” a variety of policy instruments to support its technonationalism and indigenous innovation push in these sectors to include:

*(1) sectoral protectionism; (2) the cultivation of local and national champions; (3) pushing hard for technology transfers; (4) the use of state catalogues to regulate investment and technology imports; (5) the promotion of Chinese technology standards domestically and internationally; and (6) an increasingly vigorous 'going out' strategy to open up foreign markets for Chinese products as well as to secure energy and other critical supplies for the country.*<sup>86</sup>

\*The Group of Twenty (G20) is an international forum for government and central banks from 20 major countries to meet and discuss international financial stability issues. Members include Argentina, Australia, Brazil, Canada, China, the EU, France, Germany, India, Indonesia, Italy, Japan, Mexico, Russia, Saudi Arabia, South Africa, South Korea, Turkey, the United Kingdom, and the United States. International organizations such as the Financial Stability Board, International Labor Organization, International Monetary Fund, Organisation for Economic Co-Operation and Development, World Bank, World Trade Organization, and the UN also participate. G20 2016 China, “About G20,” November 27, 2015.

†Intelligent manufacturing seeks to integrate information technology into the manufacturing process for more precise, easily scalable, efficient production.

The Chinese government is also attempting to improve SOEs' productivity and global competitiveness through mixed ownership and consolidation, but announced reforms strengthen government control rather than allow a "decisive role" for the market.<sup>87</sup> (For more information on SOE reforms, see Chapter 1, Section 2, "State-Owned Enterprises, Overcapacity, and China's Market Economy Status.") The continuation of these industrial policies puts U.S. and other foreign firms at a disadvantage competing in China's market and abroad. For instance, Samm Sacks, China technology policy analyst at the political risk consulting firm Eurasia Group, noted that U.S. and other foreign technology firms will face greater market access costs due to stricter security reviews, added compliance costs and risks to core intellectual property, and fierce competition from state-supported firms.<sup>88</sup> Without meaningful reform, the 13th FYP's policies risk expanding the overproduction and distorted market conditions that occurred as a result of the 12th FYP's promotion of strategic emerging industries.<sup>89</sup>

### ***Indigenous Innovation***

The Chinese government aims to utilize innovation to move Chinese manufacturing up the value-added chain, establish China as a global center of innovation and technology, and ensure long-term productivity. Largely reiterating the 12th FYP's state-directed strategy,\* the 13th FYP increases R&D spending, the number of technology clusters and patents filed, incentives for foreign direct investment, and government procurement and customer enticements to spark market demand.<sup>90</sup> By 2020, the Chinese government aims to increase its global innovation ranking from 18 to 15,† the share of R&D spending as a percent of gross domestic product (GDP) from 2.1 to 2.5, and the number of patents filed per 10,000 people from 6.3 to 12.<sup>91</sup>

But engineering innovation by fiat is difficult. Innovation efforts under the 12th FYP were plagued by inefficient allocation of funding, weak quality management, and plagiarism, according to Jost Wubbeke, research associate at the German think tank the Mercator Institute for China Studies (MERICS).<sup>92</sup> Furthermore, strong state control hinders academic freedom, market competition, and the free flow of ideas—the basis for innovation.<sup>93</sup> Overall, President Xi's emphasis on indigenous innovation discriminates against U.S. and other foreign firms by replacing foreign technology with products and services from and by Chinese firms.<sup>94</sup>

\* For additional analysis on innovation under the 12th FYP, see U.S.-China Economic and Security Review Commission, Chapter 1, Section 3, "China's State-Led Market Reform and Competitiveness Agenda," in *2015 Annual Report to Congress*, November 2015, 163–167.

† This ranking is based on the Country Innovation Index, compiled by the Chinese Academy of Science and Technology for Development under the Ministry of Science and Technology. In 2015, the Country Innovation Index ranked China as the 18th most innovative country; the United States was ranked first followed by Japan, Switzerland, South Korea, and Israel. By comparison, the 2016 Global Innovation Index published by Cornell University, French business school INSEAD, and the World Intellectual Property Organization ranked Switzerland first followed by Sweden, the United Kingdom, and the United States at fourth. The report placed China 25th out of 128 countries. Ministry of Science and Technology of the People's Republic of China, "Country Innovation Index Report 2015 Released," July 25, 2016. Staff translation; Soumitra Dutta, Bruno Lanvin, and Sacha Wunsch-Vincent, eds., *The Global Innovation Index 2016*, 2016.

### ***Made in China 2025 and Internet Plus***

The 13th FYP emphasizes the “Made in China 2025” and “Internet Plus” initiatives,\* which aim to grow domestic capability in emerging industries such as high-end equipment, ICs, biomedicines, cloud computing, mobile Internet, and e-commerce,<sup>95</sup> supplanting established U.S. and other foreign technological leaders. The Made in China 2025 action plan outlines a ten-year strategy to build intelligent manufacturing capabilities, enhance innovation, and upgrade ten key sectors.<sup>96</sup> These sectors, many of which were previously designated as heavyweight, strategic, or strategic emerging industries, are:<sup>97</sup>

- (1) energy-saving and new energy vehicles
- (2) next-generation information technology
- (3) biotechnology
- (4) new materials
- (5) aerospace
- (6) ocean engineering and high-tech ships
- (7) railway
- (8) robotics
- (9) power equipment
- (10) agricultural machinery

The Internet Plus initiative hopes to capitalize on China’s huge online consumer market by building up the country’s domestic mobile Internet, cloud computing, big data, and the “Internet of Things” † sectors, and create global competitors by assisting domestic firms’ expansion abroad.<sup>98</sup> To support these objectives, the 13th FYP aims to increase the fixed broadband household penetration ratio from 40 percent in 2015 to 70 percent in 2020, and raise the mobile broadband subscriber penetration ratio from 57 percent in 2015 to 85 percent by 2020.<sup>99</sup>

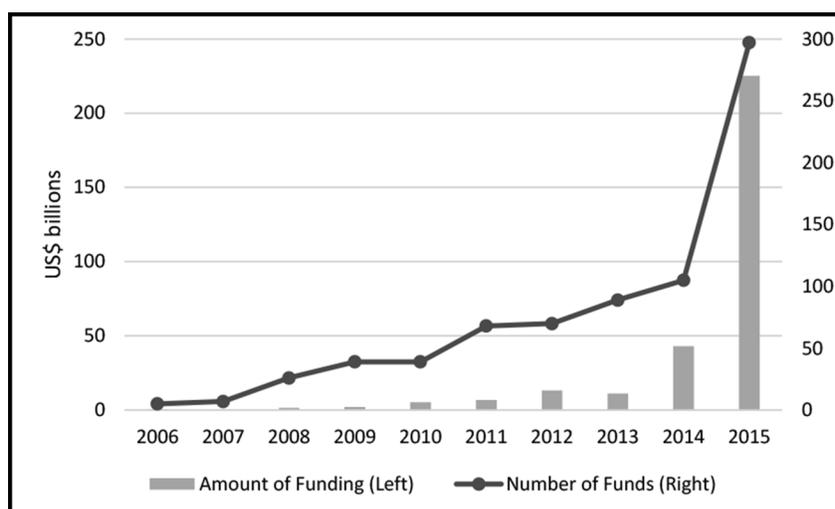
The Chinese government is also directing significant financial resources to develop technologies and firms in these industries through government-controlled venture capital funds.<sup>100</sup> China had 780 government-connected investment funds with a total of nearly \$326 billion (RMB 2.18 trillion) under management by the end of 2015 (see Figure 3).<sup>101</sup> This amount is five-times larger than any other startup funds raised in the world.<sup>102</sup> In 2015 alone, the Chinese government created 297 such funds with \$225.2 billion of investment.<sup>103</sup> In August 2016, the State Council approved a nearly \$30 billion (RMB 200 billion) government-controlled venture capital fund to invest in innovative technology and industrial upgrades to

\*For comprehensive backgrounds on the Made in China 2025 and the Internet Plus initiatives, see Tai Ming Cheung et al., “Planning for Innovation: Understanding China’s Plans for Technological, Energy, Industrial, and Defense Development,” *University of California Institute on Global Conflict and Cooperation* (prepared for the U.S.-China Economic and Security Review Commission), July 28, 2016, 43–56.

†The Internet of Things is the interconnectivity between physical objects such as a smartphone or electronic appliance via the Internet that allows these objects to share data. For more information, see Harald Bauer, Mark Patel, and Jan Veira, “The Internet of Things: Sizing up the Opportunity,” *McKinsey & Company*, December 2014.

boost the efficiency of China's central SOEs.<sup>104</sup> Government-holding companies (China Reform Holdings Corp. Ltd. and Shenzhen Investment Holdings) and state-owned banks (China Postal Savings Bank and China Construction Bank Corporation) will finance the fund.<sup>105</sup> Although this fund is domestically focused, it remains unclear whether any of this money will be used to acquire foreign technology and products.

**Figure 3: Chinese Government-Connected Investment Funds, 2006–2015**



Source: Jessie Gui, "China Government Guidance Fund Development Research Report 2016 Released; Interim Measures Supports Four Major Areas and Specifies Negative List," *PE Daily*, March 11, 2016.

### ***The High-Tech Sectors: Automobiles, Aerospace, and Semiconductors***

The 13th FYP continues the Chinese government's efforts to develop domestic globally competitive aerospace, automotive, and semiconductor firms. Existing policies require U.S. and other foreign firms to transfer technology, move manufacturing and assembly facilities to China, and collaborate with their future competitors, impacting U.S. firms' profitability, operations, and future competitiveness. These three industries are important to the U.S. economy, sustaining and creating millions of high-paying jobs and high-value-added exports. Together, the aerospace, automotive, and semiconductor industries accounted for 3 million—or about a quarter of—U.S. manufacturing jobs in 2014.<sup>106</sup> Aerospace employed 1.28 million workers as of 2012; in 2014, the automobile industry employed 1.55 million, and the semiconductor industry employed 244,800.<sup>107</sup> In addition, civilian aircraft and components, automobiles, and semiconductors are the three largest U.S. manufacturing exports to the world, accounting for 18.2 percent of total U.S. exports to the world in 2015.<sup>108</sup> The Chinese government's efforts to supplant U.S. leaders in these sectors have successfully cre-

ated lower-end producers and suppliers, but Chinese firms continue to lag behind U.S. competitors in terms of quality, reliability, and technological edge.<sup>109</sup>

### *Commercial Aviation*

The Chinese government provided over \$7 billion in initial financing to develop its own commercial aviation industry, which it views as a foundation for technological innovation and national defense.\* The Chinese government has created a national champion, Commercial Aircraft Corporation of China, Ltd. (COMAC), provided significant subsidies, required joint ventures, incentivized foreign manufacturers to shift sourcing and assembly operations to China by promising them business from state-owned airlines, and encouraged the purchase of domestically produced aircraft by domestic airlines and foreign countries.<sup>110</sup> These policies have been relatively successful at increasing production: Chinese aviation output rose from \$6.8 billion in 2005 to \$16 billion in 2010—a 134.3 percent increase—and Chinese aviation exports grew 111.8 percent from \$995 million in 2005 to \$2.1 billion in 2010.<sup>111</sup> But Chad J.R. Ohlandt, aerospace engineer at RAND Corporation, noted in his testimony before the Commission that “the effort has not yet resulted in globally competitive products or major companies.”<sup>112</sup> COMAC’s two aircraft, the ARJ21 regional jet and C919 passenger jet, have been built primarily with foreign components and have yet to establish a record of safety and operational cost efficiency; as of June 2016, only the ARJ21 has begun deliveries.<sup>113</sup>

Concerned over its continued reliance on high-value-added foreign technologies and parts (particularly engines and avionics), COMAC and the aerospace and defense SOE Aviation Industry Corporation of China (AVIC) have redoubled their efforts to build their own avionics and engine capabilities.<sup>114</sup> In 2011, General Electric entered into a joint venture with AVIC to “develop and market integrated, open architecture avionics systems to the global commercial aerospace industry for new aircraft platforms,” particularly the C919.<sup>115</sup> This joint venture eventually aims to become a global commercial avionics supplier and provide avionics directly to Boeing, Airbus, and Embraer.<sup>116</sup> In July 2016, the State-Owned Assets Supervision and Administration Commission of the State Council established a new aviation SOE specializing in aircraft engine development, Aero Engine Corporation of China.<sup>117</sup> Through this new SOE, the Chinese government is hoping to develop its own commercial aerospace engine, enhance its technological capabilities, and strengthen its defense manufacturing.<sup>118</sup> This new SOE has \$7.5 billion (RMB 50 billion) in registered capital, counting COMAC, AVIC, the State Council, and the Beijing municipal government as its investors.<sup>119</sup> The General Electric-AVIC joint venture and the creation of this new SOE may enable China to accelerate the indigenous development of its aircraft industry.

\* For in-depth analysis of China’s commercial aerospace industry, see Keith Crane et al., “The Effectiveness of China’s Industrial Policies in Commercial Aviation Manufacturing,” *RAND Corporation*, April 2014; and Roger Cliff, Chad J.R. Ohlandt, and David Yang, “Ready for Takeoff: China’s Advancing Aerospace Industry,” *RAND Corporation*, (prepared for the U.S.-China Economic and Security Review Commission), March 1, 2011.

Lured by the second-largest aircraft market, U.S. aerospace manufacturers such as Boeing, General Electric, and Pratt & Whitney have formed joint ventures with COMAC and moved some of their manufacturing and assembly operations to China to gain market access.<sup>120</sup> U.S. firms believe they have safeguarded their intellectual property and technologies by maintaining key component manufacturing outside of China, but they are increasingly integrating Chinese-made parts into the supply chain.<sup>121</sup> From 2009 to 2013, U.S. imports of aerospace equipment from China roughly doubled to \$900 million. A large share of these imports reflects transfers between a U.S.-China joint venture and the U.S. firm.<sup>122</sup> While such imports may be cost effective and ensure sales, they represent a loss of U.S. aviation manufacturing production and jobs.

### *Automobiles*

Over the last three decades, China's economic growth and automobile industrial policy has transformed the country into the world's largest automobile market and automobile producer, creating a modern supply network and millions of local jobs.<sup>123</sup> The Chinese government has sought to develop its own domestic automobile industry by disadvantaging U.S. and other foreign automakers competing in China's market through "discrimination based on the country of origin of intellectual property, forced technology transfer, research and development requirements, investment restrictions and discriminatory treatment of foreign brands and imported vehicles," according to the Office of the U.S. Trade Representative (USTR).<sup>124</sup> Between 2009 and 2011, the Chinese government provided at least \$1 billion in subsidies to its automobile and automobile parts manufacturers.<sup>125</sup> This strong support has successfully created competitive, low-cost domestic automobile parts firms. U.S. imports of automobile parts from China grew from \$3.2 billion in 2005 to \$18 billion in 2015,<sup>126</sup> displacing U.S. production and contributing to the decline in U.S. employment. U.S. exports of complete motor vehicles to China have grown from \$444.7 million in 2005 to a high of \$10.1 billion in 2014 before falling to \$8.5 billion in 2015 due in part to China's economic slowdown.<sup>127</sup> By comparison, U.S. motor vehicle imports from China increased from \$126.7 million in 2005 to \$226.1 million in 2015.<sup>128</sup> Although still small, U.S. motor vehicle imports from China are expected to grow. In December 2015, General Motors announced it would import to the United States 30,000–40,000 Buick Envision crossover vehicles from its production facilities in China.<sup>129</sup> Foreign-made automobiles imported into the United States face a 2.5 percent duty, while U.S.-made automobiles face a 25 percent duty in China.<sup>130</sup>

Crystal Chang, lecturer in political science at University of California, Berkeley, believes Chinese government's policies have "failed to create technologically independent and globally competitive automakers."<sup>131</sup> Rather, nearly three decades of required joint ventures have created an interdependent production model, where foreign firms maintain technological and marketing expertise and Chinese SOEs excel in production, according to Dr. Chang.<sup>132</sup> U.S. firms such as General Motors and Ford have successfully leveraged these partnerships to gain market share in China; China now ac-

counts for about a third of General Motors' sales worldwide.<sup>133</sup> Cars produced by General Motors' SOE joint venture partner, SAIC General Motors, account for most of General Motors' sales in China.<sup>134</sup>

Over the next five years, the global automobile industry is expected to undergo a transformation toward electric vehicles and autonomous driving systems,<sup>135</sup> and the Chinese government plans to leverage this transformation to replace U.S. and foreign producers with domestic firms and improve China's urban air quality. The Chinese government heavily promoted electric vehicles under the 12th FYP and continues to do so under the 13th FYP.<sup>136</sup> According to the China-based strategic consulting firm Gao Feng Advisory Co., new energy vehicles, which include hybrid electric, battery electric, and fuel cell vehicles, received \$5.5 billion (RMB 37 billion) of investment under the 12th FYP and are expected to receive an additional \$9.4 billion (RMB 63 billion) in government support under the 13th FYP.<sup>137</sup> By 2020, the Chinese government hopes to have five million new energy vehicles in use; reported sales in 2015 totaled nearly 332,000.<sup>138</sup> In response to strong government support, more than 200 new energy vehicle manufacturers have sprung up in China. However, according to Wang Cheng, an official at the China Automotive Technology and Research Center,\* these manufacturers lag behind foreign competitors in terms of quality, reliability, and technological edge.<sup>139</sup>

Recognizing this gap, the Chinese government in July 2016 lifted its 50 percent cap on foreign ownership of automobile electronic systems and batteries production for new energy vehicles—in place since 1994—in the free trade zones of Fujian, Guangdong, Shanghai, and Tianjin. This loosening of restrictions allows full ownership and opens the door for foreign technological leaders such as the U.S. firm Tesla, which can only viably build a production facility in China if batteries can be locally sourced.<sup>140</sup> The lifting of foreign ownership restrictions on automobile electronic systems and batteries production for new energy vehicles is limited to the free trade zones.<sup>141</sup> National restrictions on foreign ownership of automobile production remain.†

In addition, the Ministry of Industry and Information Technology is promoting self-driving cars, or the “Internet of vehicles,” as part of the Made in China 2025 and Internet Plus initiatives. Internet firms such as Alibaba, Tencent, and Baidu; smartphone manufacturers Huawei, ZTE, and Xiaomi; and state-owned military firms are expanding into this market and seeking to set domestic technology standards.<sup>142</sup> U.S. automakers Ford and General Motors are attempting to maintain their competitive edge in the Chinese market by pursuing electric vehicles, digitization, and autonomous driving. General Motors plans to launch more than ten new green-powered vehicle models in China by 2021.<sup>143</sup> In October 2015, Ford announced it will be investing \$1.8 billion in China over the next five years to develop digital connectivity, autonomous driving, and

\*The China Automotive Technology and Research Center is a technical organization for the State Council's State-Owned Assets Supervision and Administration Commission. China Automotive Technology and Research Center, “Profile.”

†For more analysis of China's market access barriers in China's automotive industry, see U.S.-China Economic and Security Review Commission, Chapter 1, Section 2, “Foreign Investment Climate in China,” in *2015 Annual Report to Congress*, November 2015, 84–86.

smart car features for its Chinese products, and in August 2016, Ford and Baidu announced they will invest \$75 million each in the U.S. sensor technology firm Velodyne Lidar to enhance their self-driving car sensory technology.<sup>144</sup>

### *Semiconductors*

China, the world's largest assembler and manufacturer of information and communications technology and other electronic equipment, wants to move from an assembler of imported semiconductor components to designer and producer to meet growing domestic demand.<sup>145</sup> Based on data from U.S. technology research firms Gartner and IDC, China accounts for 20 percent of global personal computer consumption, 29 percent of global smartphone consumption, 17 percent of global tablet consumption, 27 percent of global automobile consumption, and 23 percent of global telecommunication equipment capital expenditures.<sup>146</sup> U.S. multinational firms accounted for 11 of the top 20 global semiconductor suppliers in 2015 and made up 50 percent of the \$335.2 billion global semiconductor market in 2015, with firms such as Intel and Qualcomm the leading global manufacturer and designer, respectively, according to World Semiconductor Trade Statistics.<sup>147</sup> Semiconductor components were the third-largest U.S. manufacturing exports over the last five years, totaling \$41.8 billion in 2015.<sup>148</sup> In 2015, U.S. firms supplied 56 percent of China's \$98.6 billion semiconductor imports.<sup>149</sup> Beyond chips, U.S. firms produce the most semiconductor manufacturing equipment, with 47 percent of global market share in 2015, followed by Japanese firms with 30 percent.<sup>150</sup>

U.S. dominance in this sector has been "central to U.S. military and economic strength," according to John Adams, former brigadier general for the U.S. Army and president of Guardian Six Consulting.<sup>151</sup> Semiconductors are a vital component in commercial high-tech electronics and many U.S. military platforms and weapons systems, including the F-35 Joint Strike Fighter and the Humvee. Beyond creating high-paying jobs and high-value-added exports, semiconductors are an important factor in driving the U.S. military's technological advantages in surveillance, communications, and propulsion, and the loss of domestic production erodes U.S. institutional and technological know-how and the ability to design and commercialize emerging defense technologies.<sup>152</sup>

The Chinese government is seeking to break China's dependence on imports from foreign producers for two reasons: First, it wants to build globally competitive domestic semiconductor firms, which will capture the revenue currently accruing to foreign companies.<sup>153</sup> Second, it wants to safeguard China's national security by breaking "the technological dominance of the West and [strengthening] the country's position in the cybersecurity war," according to Dieter Ernst, senior fellow at the East-West Center.<sup>154</sup>

China's state-directed efforts to become a semiconductor leader over the last two decades have largely failed.<sup>155</sup> China continues to have systemic weaknesses, including a lack of core technology and innovative capacity, low levels of investment, a shortage of local talent, and a failure to take into account the needs of the market.<sup>156</sup> In June 2014, the *Guidelines to Promote National Integrated*

*Circuit Industry Development* sought to address these weaknesses and set targets, including achieving greater than \$52 billion (RMB 350 billion) in annual IC revenue by 2015, maintaining a more than 20 percent compound annual industry-wide revenue growth rate through 2020,\* and becoming a global leader in the primary semiconductor IC supply chain by 2030.<sup>157</sup> The guidelines also established nearly \$107 billion (RMB 720 billion) of national and regional IC investment funds† to provide high-level support and funding between 2014 and 2017, with the goal of creating national champions, expanding domestic semiconductor fabrication capacity, and facilitating consolidation and global competitiveness of its national champions.<sup>158</sup> The creation of these funds represents a hybrid between the state-directed lending under previous FYPs and market forces by letting investors decide where funding should go.<sup>159</sup>

While the 11th and 12th FYPs similarly attempted to create globally competitive Chinese semiconductor firms, the size of the funding under the 13th FYP is a key differentiator. Most countries provide subsidies to the semiconductor industry, but the scale of China’s support is unprecedented.<sup>160</sup> According to testimony from Jimmy Goodrich, vice president of global policy at the Semiconductor Industry Association, China’s semiconductor plan “is far more comprehensive, organized, and well-funded than many other plans they have put together to date.”<sup>161</sup> The National IC Industry Investment Fund has been instrumental in providing financing for the rapid increase in domestic capacity and acquisitions abroad.<sup>162</sup> Since 2014, China-headquartered firms have proposed or finalized more than 30 mergers and acquisition deals in the semiconductor industry, totaling nearly \$20 billion.<sup>163</sup> Chinese buyers have been particularly active in the United States, with at least six completed acquisitions in 2015 and four completed acquisitions and three minority investments in 2016 (see Table 1). A majority of these investments went to small semiconductor firms; the proposed acquisition of Micron Technology, the fifth-largest semiconductor supplier by revenue in 2015, and the minority investment in Marvell Technology Group, the 24th-largest, were the two exceptions.<sup>164</sup>

**Table 1: Chinese Attempted and Completed Acquisitions and Investments in U.S. Semiconductor Companies, 2015–2016**

U.S. Target	Specialty	Chinese Investor	Value (US\$ millions)	Status
FlipChip International	Designer of wafer chip assembly and packaging	Tianshui Huatian Technology	\$40.2	Acquisition completed, April 2015

\*In 2014, total IC sales reached \$77.3 billion. China’s semiconductor industry increased at a 20.5 percent compound annual growth rate from 2004 to 2014. PricewaterhouseCoopers, “China’s Impact on the Semiconductor Industry: 2015 Update,” March 2016.

†The National IC Industry Investment Fund will include \$17.9 billion (RMB 120 billion); local governments and private equity investment funds are expected to provide \$97.5 billion (RMB 600 billion) of this funding by 2020. PricewaterhouseCoopers, “A Decade of Unprecedented Growth: China’s Impact on the Semiconductor Industry 2014 Update,” January 2015, 74.

**Table 1: Chinese Attempted and Completed Acquisitions and Investments in U.S. Semiconductor Companies, 2015-2016—Continued**

U.S. Target	Specialty	Chinese Investor	Value (US\$ millions)	Status
WiSpry	Designer of chips for wireless communication products	AAC Technologies Holdings	\$16.6	Acquisition completed, May 2015
OmniVision Technologies	Designer of chips for advanced digital imaging solutions for consumer and commercial applications	CITIC Capital Holdings, Goldstone Investment, Hua Capital Management	\$1,900	Merger completed, July 2015
Bridgelux	Designer of chips for light-emitting diode (LED) commercial and industrial lighting	China Electronics Corporation, Chongqing Linkong Development Investment	\$130	Acquisition completed, July 2015
Atmel	Designer and manufacturer of microcontrollers and touch technology for the automotive, industrial, and consumer markets	China Electronics Corporation	\$3,400	Withdrawn after higher bid from competitor, U.S. firm Dialog Semiconductor, who was later outbid by U.S. firm Micron Technologies, September 2015
Pericom Semiconductor Corp.	Designer of integrated connectivity, advanced timing, and signal integrity for the computing, communications, and consumer markets	Montage Technology Group (subsidiary of China Electronics Corporation)	\$400	Pericom rejected bid, citing a lack of committed financing and potential regulatory hurdles in China, Taiwan, and the United States, November 2015; U.S. firm Diodes acquired Pericom for \$413 million that same month
Xcerra Corporation ( <i>semiconductor test interface board business</i> )	Designer of semiconductor and electronics manufacturing testing equipment	Fastprint Hong Kong Co. (subsidiary of Shenzhen Fastprint Circuit Tech Co.)	\$2.3	Acquisition of its semiconductor test interface business completed, December 2015

**Table 1: Chinese Attempted and Completed Acquisitions and Investments in U.S. Semiconductor Companies, 2015-2016—Continued**

U.S. Target	Specialty	Chinese Investor	Value (US\$ millions)	Status
Integrated Silicon Solutions (ISSI)	Designer of chips for automotive and other industries	Uphill Investment (consortium including Hua Capital Management, SummitView Capital, E-Town Memtek)	\$640	Acquisition completed, December 2015
Initio	Designer of chips for storage devices	Sage Microelectronics	Not disclosed	Acquisition completed, January 2016
Vivante	Designer of chips for mobile, consumer, and automobile products	VeriSilicon Holdings	Not disclosed	Acquisition completed, January 2016
Integrated Memory Logic Limited ( <i>subsidiary of Exar Corporation</i> )	Designer of chips for power management and color calibration for flat-panel display and LED lighting	Beijing E-town Chipone Technology Co. (consortium including Chipone Technology Co. and Beijing E-Town International Investment and Development Co.)	\$136	Acquisition announced, June 2016
Fairchild Semiconductor	Designer and manufacturer of chips for power management and mobile applications	China Resources, Hua Capital Management	\$2,600	Fairchild rejected bid, citing concerns over Committee on Foreign Investment in the United States (CFIUS)* approval, February 2016; U.S. firm ON Semiconductors received approval from the U.S. Federal Trade Commission to acquire Fairchild for \$2.4 billion in August 2016

\*CFIUS is an interagency committee that reviews transactions that shift control of a U.S. business to a foreign person or business and the potential national security implications for the United States. U.S. Department of the Treasury, "The Committee on Foreign Investment in the United States," December 20, 2012.

**Table 1: Chinese Attempted and Completed Acquisitions and Investments in U.S. Semiconductor Companies, 2015-2016—Continued**

U.S. Target	Specialty	Chinese Investor	Value (US\$ millions)	Status
Micron Technology	Designer and manufacturer of memory chips; only U.S.-based dynamic random access memory (DRAM) manufacturer	Tsinghua Holdings	\$23,000	Micron rejected bid, citing concerns over CFIUS approval, February 2016
Multi-Fineline Electronix	Manufacturer of flexible circuits and assemblies	Suzhou Dongshan Precision Manufacturing	\$610	Acquisition completed, February 2016
Western Digital (15% stake)	Designer and manufacturer of computer hard drives	Tsinghua Unisplendour	\$3,780	Withdrawn due to CFIUS concerns, March 2016
GigOptix (3.8% stake)	Designer of chips for cloud connectivity, data centers, and high-speed optical and wireless networks	Shanghai Pudong Science and Technology Investment	\$5	Purchase of minority stake completed, March 2016
Lattice Semiconductor Corporation (8.65% stake)	Designer of low-power, programmable chips for high-tech data centers and telecommunication networks with dual-use applications	Tsinghua Unigroup	\$41.5	Purchase of 6% share completed, April 2016; share increased to 8.65% in May 2016
Mattson Technology	Manufacturer and supplier of semiconductor manufacturing equipment	Beijing E-Town Dragon Semiconductor Industry Investment Center	\$300	Acquisition completed, May 2016
Marvell Technology (~2% stake)	Designer of storage, cloud infrastructure, Internet of Things, connectivity and multimedia semiconductor chips	Tsinghua Holdings	\$78.2	Purchase of minority stake completed, May 2016
Global Communications Semiconductors	Designer and manufacturer of radio frequency, wireless, power electronic, and optoelectronic chips	SAIC Acquisition (subsidiary of Xiamen Sanan Integrated Circuits)	\$226	Withdrawn after CFIUS rejected the merger, August 2016

**Table 1: Chinese Attempted and Completed Acquisitions and Investments in U.S. Semiconductor Companies, 2015–2016—Continued**

U.S. Target	Specialty	Chinese Investor	Value (US\$ millions)	Status
Analogix Semiconductor	Designer of high-speed, mixed-signal chips for use in high-performance displays such as mobile devices, virtual and augmented reality, and other products	Beijing Shanhai Capital Management, National IC Industry Investment Fund	\$500	Announced merger, September 2016

Sources: Various.<sup>165</sup>

Beyond significant investment, Mr. Goodrich outlined additional policies impacting U.S. semiconductor firms' operations in China: government-funded R&D grants, state-guided procurement orders, technology transfer requirements, China-specific standards, cybersecurity trade barriers,\* encryption limitations, and security testing and licensing.<sup>166</sup> These policies support domestic firms while limiting U.S. semiconductor firms' market access to their largest customer. In order to gain and maintain market access, U.S. and other foreign firms appear to be acceding to Chinese demands to transfer technology and form joint ventures with its firms. Recent examples of China leveraging market access in exchange for technology include:

**Qualcomm:** In February 2015, the National Development and Reform Commission, China's chief industrial policymaking agency and regulatory body, fined Qualcomm—the world's largest producer of smartphone chips—\$975 million for allegedly using its dominant market share to overcharge Chinese telecommunications firms for its patent royalties.† This fine was the largest penalty ever imposed on a company by the Chinese government.<sup>167</sup> In addition to paying the fine, Qualcomm agreed to offer 3G and 4G licenses at a lower price in China than Qualcomm's normal wholesale figure. Moreover, Qualcomm would provide these licenses separately from its other patents and permit existing licensees to take advantage of the new sales terms in January 2015. Qualcomm also agreed to no longer require chip customers to sign a licensing agreement with “unreasonable conditions,” as determined by the National Development and Reform Commission, prior to the sale of baseband chips.<sup>168</sup>

Qualcomm, reliant on the Chinese market for nearly half its revenue,<sup>169</sup> launched a “globalization” unit in May 2015 to assist Chinese smartphone makers—such as Huawei and Xiaomi—in expand-

\* For more information on the impact of China's cybersecurity barriers on U.S. firms, see U.S.-China Economic and Security Review Commission, Chapter 1, Section 4, “Commercial Cyber Espionage and Barriers to Digital Trade in China,” in *2015 Annual Report to Congress*, November 2015, 210–217.

† For more information on the antimonopoly case, see U.S.-China Economic and Security Review Commission, Chapter 1, Section 2, “Foreign Investment Climate in China,” in *2015 Annual Report to Congress*, November 2015, 96–97.

ing abroad, and allocated \$150 million for investments in Chinese startups to regain access to its most important market.<sup>170</sup> In June 2015, a subsidiary of Qualcomm partnered with Huawei, IMEC research institute, and Semiconductor Manufacturing International Corporation, China's leading foundry and world's fifth largest foundry, to create an equity joint venture to develop 14 nanometer chips.<sup>171</sup> According to Qualcomm, this joint venture "reinforces Qualcomm's commitment to the continued growth of the vibrant semiconductor ecosystem in China."<sup>172</sup> Semiconductor Manufacturing International Corporation noted that this collaboration will "open up R&D and manufacturing resources in this industry's ecosystem, and develop our advanced technology and R&D capabilities."<sup>173</sup> In January 2016, Qualcomm formed a joint venture with the Guizhou provincial government to make advanced server chips customized for Chinese customers, which Qualcomm noted will strengthen its "commitment as a strategic partner" and "yield mutual benefits for both sides as we together pursue a very large data center opportunity in China."<sup>174</sup>

**Intel:** In September 2014, Intel, which generates one-fifth of its annual revenues from China, signed a \$1.5 billion joint-venture deal to get a 20 percent stake in Chinese state-owned subsidiary Spreadtrum.<sup>175</sup> Intel said this partnership will "expand the product offerings and adoption for Intel-based mobile devices in China and worldwide."<sup>176</sup> However, some analysts have suggested this deal is in part an effort to avoid the regulatory hurdles its competitors such as Qualcomm are facing.<sup>177</sup> In October 2014, Intel's venture capital firm invested \$28 million in five Chinese mobile device companies, and in April 2015, Intel announced a \$17.9 million (RMB 120 million) investment to support Chinese high-tech startups. These partnerships offer Chinese firms financial, product design, manufacturing, and sales and marketing support.<sup>178</sup> In January 2016, Intel further expanded its Chinese partnerships with a "strategic collaboration" with Tsinghua University and Montage Technology Global Holdings Ltd., a subsidiary of the state-owned information technology firm China Electronics Corporation, to develop custom computer processors in order to meet Chinese security requirements.<sup>179</sup> Intel noted that this collaboration will "create new and compelling indigenous products while preserving the respective intellectual property ownership of all parties."<sup>180</sup>

### **China's Fiscal and Financial Reforms**

Fiscal and financial reforms are critical to improving capital allocation efficiency in China's economy. The current system has created indebted local governments with unfunded mandates and bloated SOEs. According to Eswar Prasad, senior professor of trade policy at Cornell University, the Chinese government is simultaneously attempting to achieve two contradictory approaches: "letting the market work," while maintaining the "paternalistic oversight of the state."<sup>181</sup> Dr. Prasad noted in his testimony to the Commission that most reform efforts have focused on financial or capital markets, while reform of China's tax revenues and government spending has been very limited and slow.<sup>182</sup> He attributed

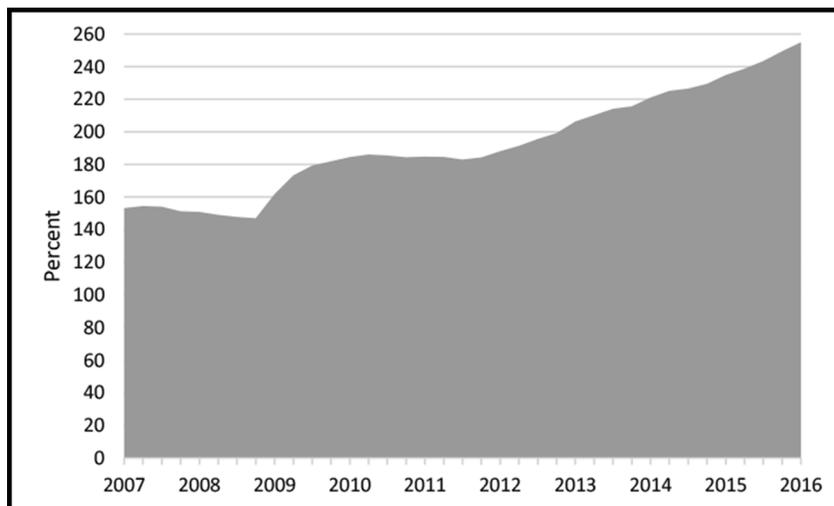
the Chinese government's success in pushing through financial sector reform last year and overcoming opposition to two factors: a strong political advocate (the PBOC) and clear objectives (getting the RMB into the Special Drawing Rights\* basket).<sup>183</sup> However, without a new clear objective, the impetus for additional reforms has weakened. (For more information on the inclusion of the RMB into the Special Drawing Rights basket, see Chapter 1, Section 1, "Year in Review: Economics and Trade.")

### ***Fiscal and Financial Challenges***

The Chinese government is overhauling its fiscal and financial systems to attempt to address the funding needs of its reform agenda. China's debt challenges harken back to the 2008–2009 \$587 billion (RMB 4 trillion) stimulus package, which flooded local governments and companies in designated sectors with cheap credit, leading to unsustainable debt burdens and overcapacity.<sup>184</sup> China's total debt to GDP has grown from 151.3 percent in 2007 to 254.6 percent in the first quarter of 2016, reaching \$27.2 trillion (see Figure 4).<sup>185</sup> In a discussion with the Commission in Beijing, Michael Pettis, professor of finance at Beijing University, noted that although a banking crisis in the next two years is unlikely, the enormous growth of debt is unsustainable.<sup>186</sup> According to Andrew Polk, China director at the financial consultancy Medley Global Advisors, the ability of the PBOC to inject liquidity through the interbank system, the stability of large Chinese banks' capital supported by China's high savings rate, and limited national exposure to city-level banks would enable the government to manage existing debt obligations and prevent a nationwide financial crisis. But Mr. Polk noted that the rising number of nonperforming loans (NPLs) could create localized financial crises in heavy industry and SOE-dependent provinces in the northeast.<sup>187</sup> These rising debt obligations raise concerns about China's ability to finance reforms laid out in the 13th FYP.<sup>188</sup> (For more information on China's rising debt levels, see Chapter 1, Section 1, "Year in Review: Economics and Trade"; for more on the challenges associated with SOE debt, see Chapter 1, Section 2, "State-Owned Enterprises, Overcapacity, and China's Market Economy Status.")

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\* Special drawing rights (SDR) are the International Monetary Fund's (IMF) international reserve asset made up of five major reserve currencies. In November 2015, the IMF determined that the RMB had met its "freely usable" criterion and voted to include the RMB as part of the SDR, validating the PBOC's reform efforts over the last year. For more information, see Eswar S. Prasad, "China's Efforts to Expand the International Use of the Renminbi," (prepared for the U.S.-China Economic and Security Review Commission), February 4, 2016, 82–89.

**Figure 4: China's Total Debt-to-GDP Ratio, 2007–Q1 2016**

Source: Bank of International Settlements, “Long Series on Total Credit to the Non-financial Sectors,” September 8, 2016.

### ***Mounting Debt Challenges for Local Governments***

China’s central-local government fiscal system allocates 53 percent of tax revenue to local governments, but requires local governments to fund 85 percent of centrally mandated programs.<sup>189</sup> To bridge the revenue gap, local governments have relied on off-balance-sheet local government financing vehicles (LGFVs)\* and sales of land-use rights, commonly seized from local farmers at below-market prices.<sup>190</sup> The total size of local government debt, including LGFVs, is not known. China’s National Audit Office reported that LGFV debt reached \$3.4 trillion (RMB 23 trillion) in 2015, but this number only measures direct LGFV debt for local infrastructure projects and does not incorporate all the commercial projects that LGFVs are now involved in.† A September 2016 paper from the Brookings Institution estimated that LGFVs financed around three-quarters of China’s fiscal stimulus in 2009 and 2010, and that after the stimulus, local governments used LGFVs to obtain financing for local champions and infrastructure projects, creating around \$7.2 trillion (RMB 48 trillion) in LGFV debt by 2015.<sup>191</sup>

In 2014, the State Council’s amendments to the *National Budget Law* outlined its fiscal restructuring plan to bring off-balance sheet borrowing onto the budget, reduce the risk of local government default, and create more affordable revenue sources.<sup>192</sup> Reforms since 2014 were aimed at reducing the debt burden and bringing all off-balance-sheet borrowing into the official budget. According to a

\* LGFVs use land and other government assets as collateral to raise funds for major infrastructure and real estate projects.

† The China-based financial database WIND, which measures only LGFVs that issue bonds, found that LGFV debt totaled \$5.5–5.6 trillion (RMB 37–38 trillion) in 2015. Chong-En Bai, Chang-Tai Hsieh, and Zheng (Michael) Song, “The Long Shadow of a Fiscal Expansion,” *Brookings Papers on Economic Activity*, Conference Draft, September 15–16, 2016, 12–13.

2016 International Monetary Fund (IMF) report, following these reforms, China's general government debt jumped from 15.2 percent of GDP in 2013 to 38.5 percent of GDP in 2014.<sup>193</sup> Although off-balance-sheet borrowing is officially prohibited, Chinese officials have acknowledged that some local governments continue to use LGFVs, highlighting the difficulty of implementation.<sup>194</sup> Recent economic weakness has slowed growth in tax revenue, so it is more difficult for local governments, particularly in poorer provinces, to service their debt.<sup>195</sup>

Local government expenditures are also growing, further stretching already tight budgets. The Chinese government estimates that achieving three of the 13th FYP's objectives will require \$8.1 trillion (RMB 54 trillion) of public and private investment by 2020 (see Table 2 for the costs of select 13th FYP initiatives). In addition, the Chinese Academy of Social Sciences, a government think tank, estimated that pension funds, currently underfunded with low returns, could reach a cumulative shortfall of \$119.7 trillion (RMB 802 trillion) from 2014 to 2050.<sup>196</sup> Chinese provinces are already beginning to experience such shortfalls: in 2015, pension payouts exceeded contributions in six provinces (Heilongjiang, Liaoning, Jilin, Hebei, Shaanxi, and Qinghai).<sup>197</sup> In March 2016, Premier Li announced that to partially offset local governments' rising expenditures, there will be a 12.2 percent increase in central to local transfer payments and the central government's fiscal deficit will increase from \$238.8 billion (RMB 1.6 trillion) in 2015 to \$328.4 billion (RMB 2.2 trillion) in 2016, the highest deficit in six years.<sup>198</sup> Although the central government's efforts to raise funds are important, they are not enough; China's current fiscal system simply cannot fully finance the reform agenda.<sup>199</sup>

**Table 2: Expected Total Costs of Select Initiatives under the 13th FYP**

<b>Initiatives</b>	<b>Estimated Public and Private Sector Costs (2020)</b>
Urbanization	\$6.3 trillion (RMB 42 trillion)
Healthcare	\$298.9 billion (RMB 2 trillion)
Clean Energy and Environmental Priorities	\$1.5 trillion (RMB 10 trillion)
<b>TOTAL</b>	<b>\$8.1 trillion (RMB 54 trillion)</b>

*Note:* Urbanization cost estimates are from 2014 to 2020. Healthcare expenditures are based on a study by the World Bank, Chinese government agencies, and Chinese researchers that calculated a 9.4 percent annual increase in real healthcare costs from 2015 to 2020 under a business-as-usual scenario.

*Source:* Amy He, "The World's Biggest Uprooting," *China Daily*, April 11, 2014; World Bank Group et al., "Deepening Health Reform in China: Building High-Quality and Value-Based Service Delivery," July 22, 2016, 14–15; and People's Bank of China and U.N. Environment Program, *Establishing China's Green Financial System: Report of the Green Finance Task Force*, April 2015, 5.

### ***Fiscal Reform***

The Chinese government is reforming its fiscal system to match responsibilities with revenue sources and to adjust tax distribution in order to create more reliable, stable sources of revenue for local governments, according to Yilin Hou, professor of public adminis-

tration and international affairs at Syracuse University.<sup>200</sup> The 13th FYP reiterates the reform commitments outlined in the 2014 National Budget Law and the Third, Fourth, and Fifth Plenums.<sup>201</sup> But while current fiscal reforms have focused on restructuring existing debt obligations and clarifying central-local responsibilities, announced reforms are not creating new, sustainable sources of funding required for China's broader reform agenda.<sup>202</sup> Key developments in fiscal reform over the last year include:

- *Delineation of central-local tax collection and expenditure responsibilities:* In August 2016, the State Council released the *Guiding Opinions on Promoting Central-Local Fiscal Power and Expenditure Responsibilities Reform*, which seeks to delineate the tax collection and expenditure responsibilities of central and local governments. It set aside for central government financing: national defense, foreign policy, national security, immigration, highways for national defense, oversight over boundary waterways, national infectious disease response, national communications channels, usage of strategic natural resources, and safeguarding basic public services. Local governments will be responsible for providing public security, municipal transportation, rural roads, urban and rural community affairs and other functions with strong regional benefits, and information related to basic public services for local residents. Local and central governments will share expenditures for overlapping responsibilities such as environmental protection and public services (including basic pension, basic public healthcare, and compulsory education). Local governments will be able to issue government bonds and receive central government transfer payments to make up for any gaps in funding these areas of responsibility. In addition, provincial governments are to finance a greater share of municipal and village government expenditures. These reforms will be gradually implemented over the next five years beginning this year with fiscal reforms related to national defense, national security, foreign affairs, public security, and basic public services, and the roll-out of provincial governments' financial assistance to fiscally-strapped municipal and village governments. In 2017–2018, the Chinese government will gradually reform the fiscal system related to education, healthcare, environmental protection, and transportation. In 2019–2020, the Chinese government plans to finalize a clear delineation of central-local government tax powers and expenditure responsibilities.<sup>203</sup>
- *Roll-out of value-added tax (VAT) \* completed:* On May 1, 2016, the State Administration of Taxation and the Ministry of Finance finished their nearly three-decades-long roll-out of the VAT by expanding the VAT to the construction, real estate, financial, and consumer services industries.<sup>204</sup> The VAT re-

\*VAT is calculated based on the difference between a good's price before taxes and its cost of production. The VAT will apply to imports as a withholding based on the nature of service provided; exports are generally exempt or roughly zero. KPMG, "China Tax Alert," Issue 9, March 2016.

places the “business tax”<sup>\*</sup> that created double taxation issues for the service sector.<sup>205</sup> The service sector is expected to benefit from the \$77.3 billion (RMB 500 billion) reduction in taxes this year, boosting growth and facilitating China’s rebalance to more service-driven and consumption-led growth.<sup>206</sup> At the same time, this transition will reduce government revenue by the same amount, placing additional strain on local government finances. Local governments relied on the business tax as one of their largest sources of revenue.<sup>207</sup> To offset this loss, the central government has raised local governments’ share of VAT revenue from 25 percent to 50 percent.<sup>208</sup>

- *Expansion of debt-for-bonds swaps:* In June 2015, the Ministry of Finance launched a debt-for-bonds swap program that converted high-risk local government debt due in 2015 and 2016 to lower-yielding, longer-maturity municipal bonds.<sup>209</sup> This program has been instrumental in preventing local government defaults and reducing their burden of repayments.<sup>210</sup> Since the program began, local governments have issued a total of \$925.4 billion (RMB 6.2 trillion) in swaps, according to analysis by the bond credit rating firm Moody’s.<sup>211</sup> Moody’s further estimated that 29 of China’s 32 provinces have issued bonds to refinance 48 percent of their estimated debt due in 2016.<sup>†</sup> However, this policy only bides time. New sources of local government revenue need to be created to eventually pay off this debt and prevent such reckless borrowing in the future.<sup>212</sup>
- *Renewed call for property tax:* Revenue from land use is finite, and Dr. Hou testified before the Commission that implementing a recurrent property tax <sup>‡</sup> will create the sustainable, long-term tax base that local governments need and slow the rise of housing prices by implementing a cost for owning a home.<sup>213</sup> The central government began calling for a property tax in 2003, but significant bureaucratic and logistical hurdles continue to stymie progress.<sup>214</sup> The first pilot property tax programs (in Chongqing and Shanghai municipalities) were launched in 2011 but generated low levels of revenue due to lax enforcement and widespread exemptions.<sup>215</sup> In March 2015, the Ministry of Land and Resources launched a nationwide property registration system that sets the stage for a nationwide property tax and expanded the crackdown on official corruption.<sup>216</sup> The 13th FYP repeats calls for a property tax, but the Chinese government has not announced any reforms despite a 2017 deadline for the National People’s Congress to enact a property tax.<sup>217</sup>

<sup>\*</sup> Business tax is calculated based on the gross revenue of a business.

<sup>†</sup> At least 40 percent of the bonds issued in the first half of 2016 have maturities of seven years or more. Nicholas Zhu, “Regional and Local Governments—China: Key Factors Shaping Standalone Credit Strength,” August 24, 2016, *Moody’s Investors Service*, 8–9.

<sup>‡</sup> China’s current taxes on property and land include urban and township land use tax, the farmland occupancy tax, the deed tax, stamp duties, and a one-off property tax levied on the original purchase price or construction value net of 10–30 percent of value in urban areas. W. Raphael Lam and Philippe Wingender, “China: How Can Revenue Reform Contribute to Inclusive and Sustainable Growth?” *International Monetary Fund*, March 2015.

### ***Financial Sector Reform***

China's financial sector reforms aim to expand access and mobility of capital accounts,\* increase the flexibility of its exchange rate, and build strong financial institutions. In the last year, the PBOC has made progress in banking sector reform with liberalized deposit rates, establishment of an explicit deposit insurance scheme, and opening of China's banking sector to private Chinese firms.<sup>218</sup> Mr. Polk in a meeting with the Commission in Beijing explained that in attempting to simultaneously defend its exchange rate, keep interest rates low, and open up capital accounts, the Chinese government is facing a classic economic policy trilemma.† As the ability to move capital in and out of China increases, Chinese citizens and investors will pursue higher returns abroad, placing pressure on China's currency to devalue.<sup>219</sup> To maintain the value of the RMB, the PBOC must use its foreign reserves to buy RMB. Facing significant capital outflows in 2015, the PBOC bought up RMB with its foreign exchange reserves to maintain demand, leading to a \$438.1 billion decline in foreign reserves; foreign reserves largely stabilized in the first eight months of 2016, dropping just \$45.7 billion to \$3.2 trillion.<sup>220</sup> Furthermore, efforts to strengthen financial institutions, such as enhanced auditing and accounting standards, strong regulatory frameworks, and corporate governance—necessary to increase the liquidity of financial markets and attract foreign investors—have proceeded much more slowly.<sup>221</sup>

The CCP remains unwilling to relinquish control over how laws and regulations are implemented, and its concerns over social stability have hindered efforts to impose hard borrowing constraints on bankrupt zombie‡ firms.<sup>222</sup> Instead, China is resurrecting the securitized debt market and debt-for-equity swaps to address its rising number of NPLs. According to James Daniel, José Garrido, and Marina Moretti, analysts at the IMF, these programs “are not comprehensive solutions by themselves—indeed, they could worsen the problem, for example, by allowing zombie firms to keep going.”<sup>223</sup> A 2016 IMF report found the amount of off-balance-sheet borrowing, commonly known as shadow banking,§ grew 48 percent to reach around \$6 trillion (RMB 40 trillion) in 2015, equal to 58 percent of China's GDP and 40 percent of bank's corporate debt.<sup>224</sup> Chinese banks, particularly smaller banks, accounted for 38 percent of this shadow lending due in part to banks repackaging NPLs as investment securities to avoid increasing their NPL levels.<sup>225</sup>

\* Capital accounts encompass foreign direct investment, portfolio investments such as equities, and bank borrowing. M. Ayhan Kose and Eswar Prasad, “Capital Accounts: Liberalize or Not?” *International Monetary Fund*.

† Under the “trilemma,” also known as the “impossible trinity,” a government can maintain only two of the following three policies: (1) a fixed (or managed) exchange rate, (2) an independent monetary policy, or (3) free international capital flows. The United States maintains open capital markets and control over both the money supply and interest rates, but has relinquished control over the dollar exchange rate.

‡ A “zombie” company generates only enough revenue to repay the interest on its debt. Because banks are reluctant to take the losses from a write-down of this debt and apply forbearance, these indebted firms are given additional time to repay loans. Hugh Pym, “Zombie Companies Eating Away at Economic Growth,” *BBC*, November 13, 2012.

§ Shadow banking is lending—such as wealth management products, credit guarantees, entrusted loans, and peer-to-peer lending—that occurs outside of the official banking system. For more information on China's shadow banking sector, see U.S.-China Economic and Security Review Commission, Chapter 1, Section 3, “Governance and Accountability in China's Financial System,” in *2013 Annual Report to Congress*, November 2013, 113–152.

Approximately half of these unregulated products are at risk of default or loss, which could create liquidity challenges for China's financial system through the interbank market or high exposure of smaller Chinese banks.<sup>226</sup> An assessment of major financial sector reforms finds the Chinese government has:

- *Liberalized deposit interest rates:* The Chinese government removed all formal interest rate controls in the fourth quarter of 2015, introducing market drivers into China's state-run banking sector.<sup>227</sup> Competition to attract depositors will increase interest rates, and banks will need to raise their returns from loans to offset these higher costs.<sup>228</sup> According to a 2016 report by the IMF, approximately 40 percent of bank loans carry an interest rate more than 10 percent higher than the benchmark rate, which should lead to better allocation of capital toward higher-yield, private sector investments.<sup>229</sup>
- *Reopened securitization market:* In May 2016, China reopened its securitized debt market, eight years after regulators closed the market at the onset of the global financial crisis. Securitization allows banks to sell NPLs to investors by repackaging them as securities or transferring them to special asset management companies.<sup>230</sup> Wary of the risks associated with securitization, Beijing has opted to first test the approach through five state-owned banks\* and the China Merchants Bank † with quotas for NPL-backed securities totaling \$7.7 billion (RMB 50 billion).<sup>231</sup> The first banks to participate, the Bank of China and China Merchants Bank, announced in May 2016 a plan to issue a combined \$79.7 million (RMB 534 million) worth of NPL-backed securities.<sup>232</sup> In July 2016, the Agricultural Bank of China announced it will be selling \$1.6 billion (RMB 10.7 billion) in NPL-backed securities, the largest sale under the pilot program.<sup>233</sup> Beijing hopes NPL securitization can help improve bank balance sheets and generate liquidity, but purchasers of these securitized bad loans are largely other state-owned banks, which simply cycles these debts around different banks and other financial intermediaries within China.<sup>234</sup>
- *Debt-for-equity swaps:* In July 2016, the State Council approved the rollout of a program allowing banks to swap NPLs for equity stakes in indebted firms.<sup>235</sup> In August 2016, Sinosteel Corporation, a central SOE, announced it will be converting half of its \$14.9 billion (RMB 100 billion) debt into three-year convertible bonds that will become equities in the fourth year.<sup>236</sup> A similar program in 1999–2004 successfully removed \$60.4 billion (RMB 405 billion) of NPLs in exchange for stakes in 580 companies.<sup>237</sup> But the debt-for-equity swap proposal does not solve China's debt problem because it allows

\*These five state-owned banks are the Industrial and Commercial Bank of China, China Construction Bank, Agricultural Bank of China, Bank of China, and Bank of Communications. Charles Li and Nicholas Health, "Update 1-China Gives Six Banks Quotas for Bad Loan Securitization—Sources," Reuters, February 25, 2016.

† China Merchants Group, a state-owned firm, and its subsidiaries, owned 30 percent of China Merchants Bank shares as of December 2015. China Merchants Bank, "2015 Annual Results Announcement," March 30, 2016, 111.

failing firms to stay operational when they should be shutting down. According to Dr. Prasad, “The program amounts to a sleight of hand that beautifies bank balance sheets but hardly comes to grips with the basic problems of bad loans, distorted incentives in the banking and state enterprise systems, and weak financial regulation.”<sup>238</sup>

### ***Capital Controls***

The Chinese government maintains an extensive capital control regime that limits the ability of domestic and foreign firms to move capital in and out of China. According to the IMF, as of 2014 China had restrictions on 14 out of the 15 measures of capital inflow openness and 15 out of 16 measures of capital outflow openness.<sup>239</sup> These policies have channeled China’s high household savings into its state-directed banks at the expense of efficient allocation of capital. Over the last decade, the Chinese government has incrementally loosened its controls on the exchange rate and capital flows, but many restrictions remain in place.<sup>240</sup> The government fears eliminating these controls too quickly could create monetary, currency, and banking crises, as it has done in other developing countries, but maintaining capital controls hinders efficient allocation of capital and prevents the internationalization of the RMB.<sup>241</sup> (For more information on China’s exchange rate policies, see Chapter 1, Section 1, “Year in Review: Economics and Trade.”) Key reforms undertaken in the last year include:

- *Widened foreign access to interbank bond market:* Created in 2010, China’s interbank bond market—the third-largest in the world—allows foreign firms and central banks to buy and sell corporate and government bonds.<sup>242</sup> In July 2015, the PBOC permitted foreign central banks and sovereign wealth funds access to the bond market without quotas or prior approval,<sup>243</sup> and in April 2016, it removed limits on the size of investment and the ability to remit funds in and out of China.<sup>244</sup> In February 2016, the PBOC expanded access to most qualified foreign institutional investors (QFIIs) such as commercial lenders, insurance banks, securities firms, asset managers, and pension and charity funds.<sup>245</sup> This opening is a step forward toward capital account convertibility and an effort by the Chinese government to widen the pool of investors and leverage foreign capital, but overall usage remains limited due in part to the rising number of bond defaults.<sup>246</sup>
- *Loosened capital accounts:* Over the last two decades, the Chinese government has gradually loosened its capital controls to promote the RMB as an international currency and set the stage for China’s emergence as a key player in the global financial market.<sup>247</sup> Since 2010, the China Securities Regulatory Commission and State Administration of Foreign Exchange have incrementally expanded the qualified domestic institutional investor (QDII) and QFII schemes that allow greater capital flows while maintaining government control through

quotas, approvals, and ceilings.\* In February 2016, the State Administration of Foreign Exchange further loosened QFII restrictions by easing filing procedures for quotas and restrictions on remitting funds in and out of China.<sup>248</sup> While the Chinese government has expanded the quota and relaxed restrictions on capital mobility, additional reforms are necessary to entice greater foreign investment.<sup>249</sup> Less than 2 percent of A-shares † are foreign owned.<sup>250</sup> In June 2016, the U.S.-based stock market index provider MSCI once again delayed inclusion of China's A-shares into its Emerging Markets Index, citing concerns over the suspension of stock trading during last year's stock crisis, ‡ limitations on capital mobility, and the 20 percent monthly repatriation cap.<sup>251</sup> Beyond the partial opening of access, foreign and domestic investors remain concerned about "weak corporate governance, limited transparency, weak auditing standards, and shoddy accounting practices" in firms listed on China's stock markets.<sup>252</sup>

- *Promoted the internationalization of the RMB:* § Dr. Prasad explained that the Chinese government encourages the international use of the RMB by promoting the settlement of trade transactions with the RMB, allowing the issuance of nearly \$400 billion worth of RMB-denominated bonds in Hong Kong, and permitting select banks to offer offshore RMB deposit accounts.<sup>253</sup> The PBOC has established bilateral swap arrangements with 34 other central banks and also sanctioned 17 offshore financial centers outside Hong Kong and Macau.<sup>254</sup> In November 2015, the IMF executive board approved the expansion of the Special Drawing Rights basket to include the RMB beginning in October 2016.<sup>255</sup> According to Dr. Prasad, the rising prominence of the RMB will gradually erode the dollar's dominant role as a unit of account for international trade transactions and medium of exchange for settling cross-border financial transactions, but will not seriously challenge the dollar's dominant reserve currency status.<sup>256</sup> Nevertheless, the RMB is still only the fifth most active currency for global payments and accounts for 1.9 percent of global payments as of July 2016, compared with the U.S. dollar at 41.3 percent and the euro at 31.3 percent.<sup>257</sup>

\* For background on the QDII and QFII, see Nargiza Salidjanova, "The RMB's Long Road to Internationalization," *U.S.-China Economic and Security Review Commission*, September 22, 2014; and Eswar S. Prasad, "China's Efforts to Expand the International Use of the Renminbi," (prepared for the U.S.-China Economic and Security Review Commission), February 4, 2016, 82–89.

† China's A-shares are RMB-denominated equities that can be purchased and traded on China's Shanghai and Shenzhen stock exchanges. Previously restricted to domestic Chinese investors, foreign investors since 2002 have been gradually allowed access to the "A" shares through the QFII, RMB qualified institutional investors (RQFIIs), and Shanghai-Hong Kong Stock Connect. Eswar S. Prasad, "China's Efforts to Expand the International Use of the Renminbi," (prepared for the U.S.-China Economic and Security Review Commission), February 4, 2016, 47–51.

‡ For more information on China's stock market instability, see Nargiza Salidjanova, "China's Stock Market Meltdown Shakes the World, Again," *U.S.-China Economic and Security Review Commission*, January 15, 2016; and Nargiza Salidjanova, "China's Stock Market Collapse and Government's Response," *U.S.-China Economic and Security Review Commission*, July 13, 2015.

§ For more information on RMB internationalization, see Eswar S. Prasad, "China's Efforts to Expand the International Use of the Renminbi," (prepared for the U.S.-China Economic and Security Review Commission), February 4, 2016.

### Implications for the United States

The 13th FYP lays out an ambitious economic and social reform agenda to reorient China's economy toward more sustainable economic drivers: domestic consumption and services. If implemented, China's focus on improving the quality of its public services, reducing its environmental footprint, and opening up the service sector provides numerous opportunities for U.S. businesses and opens avenues for U.S.-China bilateral cooperation. But the Chinese government's continued commitment to state-led economic growth is a growing challenge for U.S. and foreign firms seeking to both enter China's market and compete with its state-supported firms abroad. Furthermore, failure to implement politically difficult reforms could ensnare China's economy in a cycle of low growth, dampening global economic prospects and limiting commercial opportunities for U.S. firms.

China's push for urbanization creates new opportunities for domestic and potentially U.S. and other foreign firms in healthcare, services, transportation, and water and wastewater projects—provided these firms have market access. For example, growing Chinese demand for better healthcare could benefit U.S. pharmaceutical, hospital, and insurance firms, according to testimony from Yanzhong Huang, senior fellow for global health at the Council on Foreign Relations and professor at Seton Hall University.<sup>258</sup> China's pharmaceutical market is the world's second largest after the United States and is forecast to nearly double from \$105 billion in 2014 to \$200 billion by 2020.<sup>259</sup>

However, U.S. and other foreign biopharmaceutical firms have raised concerns about the treatment they receive in China, including forced technology transfers, lack of patent protection, long delays in approval of pharmaceutical products, and preferential treatment toward domestic firms and China-manufactured drugs.<sup>260</sup> For instance, U.S. biopharmaceutical firms maintain a competitive advantage in terms of size, technology, and R&D investment, but this sector has been identified by the Chinese government as a strategic emerging industry under the 12th FYP and a priority in the 13th FYP.<sup>261</sup> To support this industry, the Chinese government has provided subsidies for domestic firms ranging from preferential loans to tax breaks on land and capital investments, disadvantaging U.S. and other foreign competitors.<sup>262</sup> In addition, China's push for greater localization, a large and qualified talent pool of scientists, and lower operational costs may lead U.S. biopharmaceuticals and medical devices firms to outsource their production to China, eroding U.S. employment in the long run.<sup>263</sup>

The enormous growth in China's consumer spending could benefit the U.S. service sector, which in 2014 comprised 80 percent of the U.S. economy, employed 80 percent of the U.S. workforce, and accounted for 30 percent of U.S. exports.<sup>264</sup> The degree to which reforms open up China's service sector will determine the overall benefit for U.S. firms and the economy. For instance, the Chinese government's efforts to address its environmental degradation and shift toward a greener economic model may present opportunities for U.S. environmental technology and service firms, which employed around 1.6 million people and exported \$51.2 billion worth

of goods and services in 2015.<sup>265</sup> But China maintains “persistent and prohibitive” market barriers for foreign environmental technology firms, such as technical barriers and preferential treatment toward domestic firms.<sup>266</sup>

As the previous examples indicate, although China’s economic transition presents opportunities, U.S. firms operating in and exporting to China face multiple obstacles, including intellectual property theft, strict market entry criteria, opaque regulations, compulsory joint ventures, and China-specific technical regulations, according to the USTR’s 2015 review of China’s compliance with its World Trade Organization (WTO) obligations.<sup>267</sup> The Chinese government continues to control market access with foreign investment restrictions and regulations to create a protected environment for domestic firms, forcing U.S. businesses to shift production and transfer technology and know-how to Chinese competitors.<sup>268</sup> U.S. service industries such as healthcare, insurance, financial services, and express delivery services, which could capitalize on demand from China’s growing middle class, continue to face significant market access barriers due to caps on foreign equity, branching restrictions, informal bans on entry, and high capital requirements.<sup>269</sup> In addition, the Chinese government requires U.S. automobile and aviation firms to form joint ventures with Chinese competitors and outsource a portion of their manufacturing facilities and supply chains to China as a price of market entry. While outsourcing production may allow for higher exports and sales growth of the parent company, these policies have displaced U.S. workers and may erode U.S. competitiveness and technological advantage going forward.<sup>270</sup>

The loss of U.S. aerospace and semiconductor production has already reduced the U.S. workforce. From January 2005 to August 2016, the U.S. Department of Labor’s Trade Adjustment Assistance has supported 24,272 former aircraft manufacturing workers and 41,521 former workers in the semiconductor industry that have lost their job due to global trade.\* Moreover, the loss of production could undermine the ability of the United States to maintain the most technologically advanced military. According to Brigadier General John Adams, U.S. Army (Ret.), dependence on imports for use in military technologies increases the risk of foreign exploitation and vulnerability to domestic and foreign supply constraints.<sup>271</sup> For example, the use of imported semiconductors, which are a vital component in many U.S. military platforms and

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\*A further breakdown of which country these jobs went to is unavailable. The estimated number of workers covered by certified petitions from January 2005 to August 2016 for total aircraft manufacturing workers includes: 14,627 in aircraft manufacturing (NAICS code 336411), 3,570 in aircraft engine and engine parts manufacturing (NAICS code 336412), and 6,075 workers in other aircraft parts and auxiliary equipment manufacturing (NAICS code 336413). The estimated number of workers covered by certified petitions for semiconductor manufacturing jobs includes: 6,473 workers in semiconductor machinery manufacturing (NAICS code 333242) and 35,048 workers in semiconductor and related device manufacturing (NAICS code 334413). U.S. Department of Labor, *36411—Aircraft Manufacturing: Petitions Filed and Decisions Rendered between 1/1/2005 and 8/31/2016*; U.S. Department of Labor, *336412—Aircraft Engine and Engine Parts Manufacturing: Petitions Filed and Decisions Rendered between 1/1/2005 and 8/31/2016*; U.S. Department of Labor, *336413—Other Aircraft Parts and Auxiliary Equipment Manufacturing: Petitions Filed and Decisions Rendered between 1/1/2005 and 8/31/2016*; U.S. Department of Labor, *333242—Semiconductor Machinery Manufacturing: Petitions Filed and Decisions Rendered between 1/1/2005 and 8/31/2016*; and U.S. Department of Labor, *334413—Semiconductor and Related Device Manufacturing: Petitions Filed and Decisions Rendered between 1/1/2005 and 8/31/2016*.

weapons, opens the U.S. military to counterfeit chips, sabotage, and disruptions in the global supply chain.<sup>272</sup> He further argues the loss of domestic production erodes U.S. institutional and technological know-how and the ability to design and commercialize emerging defense technologies.<sup>273</sup>

Beyond constricting the commercial opportunities for U.S. firms, the Chinese government's Made in China 2025 and Internet Plus initiatives and other industrial policies are attempting to replace U.S. firms with domestic firms and technology both in China and abroad. These two initiatives reinforce preferential support for domestic firms and redouble state-directed investment into building leading-edge R&D and domestic production capacity, targeting sectors where the United States is currently the global leader, such as biotechnology and semiconductors. The scale and volume of resources the Chinese government has directed to expanding domestic production capacity in designated sectors is creating economic and national security concerns for United States.

Strong Chinese government support for domestic steel and aluminum firms and more recently solar and wind industries\*—designated as strategic emerging industries under the 12th FYP—created overcapacity and distorted global markets, contributing to falling international prices, revenue losses, and layoffs at U.S. competitors.<sup>274</sup> China's Ministry of Industry and Information Technology's creation of the nearly \$110 billion national and regional IC funds represents an unprecedented scale of financial support to build China's domestic semiconductor fabrication capacity.<sup>275</sup> Center for Strategic and International Studies researchers Chris Johnson and Scott Kennedy warned that "if China does not properly manage the scale of its investment, it could do for semiconductors and other high-tech sectors what it has done for steel and to some extent aluminum."<sup>276</sup>

China's financial system is largely disconnected from the global financial system due to its tight capital controls, so U.S. exposure to China's banking system and securities and bonds markets remains low. In the first quarter of 2016, China's share of U.S. banking assets from the four largest U.S. banks accounted for less than 1 percent of their consolidated assets (see Table 3). According to the U.S. Department of the Treasury, China accounted for \$107.8 billion (or 1.1 percent) of total U.S. government and private sector holdings of foreign securities at the end of December 2015 (latest available): \$103.1 billion in equities, \$3 billion in long-term debt securities, and \$1.6 billion in short-term securities.<sup>277</sup> Capital controls and the RMB's small share of global trade ensure that China's bond market has little regional or international impact.<sup>278</sup>

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\*For in-depth analysis of China's wind and solar policies, see Jacob Koch-Weser and Ethan Meick, "China's Wind and Solar Sector: Trends in Deployment, Manufacturing, and Energy Policy," *U.S.-China Economic and Security Review Commission*, March 9, 2015.

**Table 3: Exposure of Four Largest U.S. Banks to China, First Quarter of 2016**

U.S. Bank	Exposure to China (US\$ billions)	Consolidated Assets (US\$ billions)	China's Share
J.P. Morgan	14.4	2,015.7	0.7%
Wells Fargo	1.4	1,667.8	0.1%
Bank of America	10.0	1,653.9	0.6%
Citigroup	17.9	1,342.6	1.3%
<b>TOTAL</b>	<b>43.7</b>	<b>6,680.0</b>	<b>0.7%</b>

*Note:* Exposure includes loans, investment securities, and trading and investments. Ranking of four-largest banks based on Federal Reserve ranking of U.S.-chartered commercial banks by consolidated assets as of March 31, 2016.

*Source:* J.P. Morgan, "Form 10-Q," March 31, 2016; Wells Fargo and Company, "Form 10-Q," March 31, 2016, 25; Bank of America, "Form 10-Q," May 2, 2016, 88; Citigroup, "Form 10-Q," 82; and Federal Reserve of the United States, "Insured U.S.-chartered Commercial Banks That Have Consolidated Assets of \$300 Million or More, Ranked by Consolidated Assets as of March 31, 2016," March 31, 2016.

Limited direct U.S. exposure aside, the impact of China's slowing growth and economic reforms on trade, commodities demand, and investor confidence is affecting global financial markets.<sup>279</sup> Given China's close trade ties with the rest of Asia, investors shift capital in and out of the region based on their expectations of China's economic health. Changes in China's economic growth and reform agenda can lead to shocks in U.S. and Asian stock markets.<sup>280</sup> Steps toward loosening capital controls and promoting the internationalization of the RMB are increasing China's presence in the international financial system, deepening China's financial linkages with the rest of the world.<sup>281</sup> More global investors are able to invest in China's stock and bond markets, and more Chinese investors are able to invest internationally. As the Chinese government continues to loosen capital controls, the pool of Chinese investors widens and will shift investments away from U.S. Treasury bonds, preferred by Chinese government investors, toward higher-return investments.<sup>282</sup> The rising importance of the Chinese economy combined with the Chinese government's promotion of the RMB as an international currency may gradually erode the dollar's dominant role as a unit of account for international trade and cross-border financial transactions. At present, however, the RMB does not pose a serious challenge to the U.S. dominant reserve currency status.<sup>283</sup>

## Conclusions

- The 13th Five-Year Plan (FYP) (2016–2020) seeks to address China's "unbalanced, uncoordinated, and unsustainable growth" and create a "moderately prosperous society in all respects" through innovative, open, green, coordinated, and inclusive growth. This agenda strengthens the Chinese Communist Party's and Chinese government's roles in managing the economy while allowing a greater role for markets to determine the allocation of resources in some sectors of the economy.
- The success of the 13th FYP agenda hinges on the Chinese government's willingness to make politically difficult tradeoffs between contradictory policy objectives, overcome entrenched inter-

ests, and allow for greater volatility. While senior leadership has repeatedly reiterated its commitment to enacting reforms, it remains averse to the market volatility and social instability that reforms create.

- The Chinese government is increasing urbanization, expanding public services such as healthcare and education, and pursuing limited reforms to its household registration system to alleviate poverty, boost domestic consumption, improve quality of life, and create new drivers of economic growth. This transition is fueling enormous demand in urban infrastructure and services, but strict market entry criteria, opaque regulations, compulsory joint ventures, and China-specific technical regulations limit the market opportunities for U.S. and other foreign firms in China.
- The Chinese government is building on its success under the 12th FYP to reduce greenhouse gas and air pollution and address the more technically difficult soil and water contamination under the 13th FYP. In 2016, the Ministry of Environmental Protection stepped up enforcement of its environmental standards—a key weakness of environmental reform efforts under the 12th FYP—through its new authority to conduct random inspections of provincial and municipal governments and its expansion of national, real-time monitoring systems.
- China's renewed focus on indigenous innovation and creation of globally competitive firms in key emerging industries, such as integrated circuits, biomedicines, cloud computing, and e-commerce, targets sectors in which the United States is a global leader. Continued preferential government treatment and financial support of state-owned enterprises and designated industries have lowered these firms' cost of capital and production, creating a competitive advantage over U.S. and other private firms both within China and abroad.
- The 13th FYP requires an estimated \$8.1 trillion (RMB 54 trillion) of public and private capital just to fund portions of its agenda focused on urbanization, healthcare, and clean energy and environmental remediation. To attract sufficient investment, the Chinese government is pursuing fiscal reform, encouraging public-private partnerships, increasing its government debt, and loosening capital controls. Despite repeated pledges to allow the market to play a bigger role, the Chinese government continues to reinforce the state's central role in the economy. In addition, fiscal and financial reforms have yet to impose discipline and hard budget constraints on borrowers.

## Addendum I: Key Targets in China's 12th, and 13th FYPs\*

Target	2010 (Actual)	12th FYP (2015 Target)	2015 (Actual)	13th FYP (2020 Target) [Average Annual Rate]
<b>GDP+</b>	—	—	6.77 billion RMB	>9.27 billion RMB (E)
<b>Average GDP Growth</b>	11.2%	7% (E)	7.8%	>6.5% (E)
<b>Service Sector as % of GDP</b>	43%	47% (E)	50.5%	56% [5.5%] (E)
<b>Overall Labor Productivity (RMB/person)+</b>	—	—	87,000	>120,000 [>6.6%] (E)
<b>Urbanization</b>				
<i>Urbanization Rate (%)</i>	47.5%	51.5% (E)	56.1%	60% [3.9%] (E)
<i>Urban Hukou Household Registration Rate+</i>	—	—	39.9%	45% [5.1%] (E)
<b>R&amp;D as % of GDP</b>	1.75%	2.2% (E)	2.1%	2.5% [0.4%] (E)
<b>Patents per 10,000 People</b>	1.7	3.3 (E)	6.3	12 [5.7%] (E)
<b>Contribution of Science and Technological Advances to Economic Growth+</b>	—	—	55.3% (E)	60% [4.7%] (E)
<b>Fixed Broadband Household Penetration Ratio+</b>	—	—	40%	70% [30%] (E)
<b>Mobile Broadband Sub- scriber Penetration Ratio+</b>	—	—	57%	85% [28%] (E)
<b>Population Cap</b>	1.341 billion	1.39 billion (B)	1.375 billion	—
<b>Average Life Expectancy</b>	73.5	74.5 (E)	76.34	[1 year] (E)
<b>Rate of Nine-Year Compulsory Education Enrollment</b>	89.7%	93% (B)	93%	—
<b>Rate of High School Enrollment</b>	82.5%	87% (E)	87%	—

\*In this table, all targets followed by a + next are new and were introduced for the first time in the 13th FYP. All binding targets are marked with a (B), and expected targets an (E). Binding targets are incorporated into the CCP's evaluation criteria for government officials at every level, while expected targets (such as GDP growth) are either given less weight or not included into the CCP evaluation criteria. U.S.-China Economic and Security Review Commission, *Hearing on China Ahead of the 13th Five-Year Plan: Competitiveness and Market Reform*, written testimony of Oliver Melton, April 22, 2015, 5.

Addendum I: Key Targets in China's 12th, and 13th FYPs—*Continued*

Target	2010 (Actual)	12th FYP (2015 Target)	2015 (Actual)	13th FYP (2020 Target) [Average Annual Rate]
<b>Average Years of Education of the Working Population+</b>	—	—	10.23 years	10.8 years [0.57%] (B)
<b>New Urban Jobs Created (5-year total)</b>	57.71 million	45 million (E)	64.31 million	>50 million (E)
<b>Urban Registered Unemployment Rate</b>	4.1%	Under 5%	4.05%	—
<b>Average Growth of Per Capita Disposable Income+</b>	—	—	—	>6.5% (E)
<b>Urban Annual Per Capita Disposable Income (RMB)</b>	19,109 (+9.7%)	>26,810 (>+7%) (E)	7.7%	—
<b>Rural Annual Per Capita Income (RMB)</b>	5,919 (+8.9%)	>8,310 (>+7%) (E)	9.6%	—
<b>Reduce the Number of Rural Residents Living in Poverty+</b>	—	—		55.75 million (B)
<b>Basic Retirement Insurance Coverage Rate+</b>	—	—	82%	90% [8%] (E)
<b>Urban Population with Basic Retirement Insurance</b>	257 million	357 million (B)	377 million	—
<b>Working and Non-working Urban and Rural Cooperative Health Care Coverage</b>	—	3% (B)	>3%	—
<b>Construction of Affordable Urban Housing</b>	—	36 million housing units (B)	40.13 million housing units	—
<b>Renovation of Urban Shantytowns+</b>	—	—	—	20 million housing units (B)
<b>Reduction in Energy Intensity per Unit of GDP</b>	19.1%	16% (B)	18.2%	15% (B)
<b>Air Quality+</b>				

**Addendum I: Key Targets in China's 12th, and 13th FYPs—Continued**

<b>Target</b>	<b>2010 (Actual)</b>	<b>12th FYP (2015 Target)</b>	<b>2015 (Actual)</b>	<b>13th FYP (2020 Target) [Average Annual Rate]</b>
<i>Ratio of Good Air Quality Days in Cities at the Prefecture Level or Above+</i>	—	—	76.7%	>80% (B)
<i>Reduction in the PM<sub>2.5</sub> Concentration that Exceeds 35 Micrograms per Cubic Meter in Cities at the Prefecture Level or Above+</i>	—	—		18% (B)
<b>Surface Water Quality*+</b>				
<i>Percent of Water Meeting or Exceeding Class III Level+</i>	—	—	66%	>70% (B)
<i>Percent of Water Exceeding the Class V Level+</i>	—	—	9.70%	<5% (B)
<b>Increase of Water Efficiency Coefficient in Agricultural Irrigation</b>	0.5	0.53 (E)	0.532	—
<b>Reduction of Water Consumption per Unit of Industrial Value Added</b>	36.7%	30% (B)	35%	—
<b>Reduction in the Water Consumption per 10,000 RMB of GDP+</b>	—	—	—	23% (B)
<b>Farmland Reserves</b>	121.2 million hectare	121.2 million hectare (B)	124.3 million hectare	124.3 million hectare [0%] (B)
<b>Land Use for New Construction †+</b>	—	—	—	<2.14 million hectares
<b>Forest Development</b>				
<i>Forest Coverage</i>	20.36%	21.66% (B)	21.66%	23.04% [1.38%] (B)

\*The Ministry of Environmental Protection classifies surface water into five categories based on toxicological indicators such as chemical oxygen demand, ammonia, mercury, lead, etc. Class I and II can be used as drinking water. Liu Hongqiao, "Who Is Responsible for China's Water?" *ChinaDialogue*, October 4, 2015. For a complete list of these categories, see Ministry of Environmental Protection, *National Standards of the People's Republic of China*, GB3838–2002.

†This binding target is seeking to increase the efficiency of new urban construction by raising population and economic density. Ministry of Land and Resources, *NPC and CPPCC Delegates Passionately Discuss the 13th Five-Year Plan Draft*, March 13, 2016. Staff translation.

**Addendum I: Key Targets in China's 12th, and 13th FYPs—Continued**

<b>Target</b>	<b>2010 (Actual)</b>	<b>12th FYP (2015 Target)</b>	<b>2015 (Actual)</b>	<b>13th FYP (2020 Target) [Average Annual Rate]</b>
<i>Forest Stock</i>	13.7 trillion cubic meters	14.3 trillion cubic meters	15.1 trillion cubic meters	16.5 trillion cubic meters [14%] (B)
<b>Reduction in Carbon Emissions per Unit of GDP</b>	—	17% (B)	20%	18% (B)
<b>Nonfossil Fuel as a Per- cent of Primary Energy Consumption</b>	8.3%	11.4% (B)	12%	15% [3%] (B)
<b>Reduction of Emission of Major Pollutants</b>				
<i>Reduction in Chemical Oxygen Demand (COD)</i>	—	8% (B)	12.9%	10% (B)
<i>Reduction in Sulphur Dioxide (SO<sub>2</sub>)</i>	—	8% (B)	18.0%	10% (B)
<i>Reduction in Ammonia Nitrogen</i>	—	10% (B)	13.0%	15% (B)
<i>Reduction in Nitrous Oxides</i>	—	10% (B)	18.6%	15% (B)

*Source:* People's Republic of China, *12th Five-Year Plan on National Economic and Social Development*, March 16, 2011. Staff translation; People's Republic of China, *13th Five-Year Plan on National Economic and Social Development*, March 17, 2016. Staff translation.

## RECOMMENDATIONS

### *China's 13th Five-Year Plan*

The Commission recommends:

- Congressional committees of jurisdiction hold hearings to:
  - Analyze the impact of China's state-directed plans such as the Made in China 2025 and Internet Plus on U.S. economic competitiveness and national security, and examine the steps Congress can take to strengthen U.S. high-tech and high-value-added industries such as artificial intelligence, autonomous vehicles and systems, and semiconductors.
  - Ensure that U.S. government agencies such as the U.S. Department of Treasury, U.S. Department of Commerce, and the Office of the U.S. Trade Representative have sufficient personnel, funding, and Chinese-language capabilities to examine China's economic and trade policies and China's compliance with their bilateral and multilateral commitments, including the World Trade Organization.
  - Examine U.S. access to China's domestic market, particularly for services and high-tech sectors. This hearing should assess how U.S. government agencies such as the U.S. Department of Commerce and the Office of the U.S. Trade Representative are seeking to increase market access for U.S. firms and explore what additional policy options could be pursued.
- Congress direct the U.S. Department of the Treasury to prepare a report analyzing U.S. exposure to China's financial sector and the impact of China's financial sector reforms on the U.S. and global financial systems. This report should also identify the policies the U.S. government is or should be adopting to protect U.S. interests in response to this changing environment.

## ENDNOTES FOR SECTION 3

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