

# CHINA ECONOMIC UPDATE

## MAY 2018



## INVESTING IN HIGH-QUALITY GROWTH



WORLD BANK GROUP



## Acknowledgements

The World Bank *Economic Update* provides an overview of recent economic and social developments and policies in China and presents findings from ongoing World Bank work on China. The *Update* was led by Elitza Mileva (Senior Economist) under the guidance of John Litwack (Lead Economist) and with contributions from Luan Zhao (Economist) on recent economic developments and outlook, Elitza Mileva on the investment puzzle, and Solvita Klapare (Senior Environmental Economist) on soil remediation. The team would like to thank Xiaotong Wang and Yingyi Zhao for excellent research assistance. Helpful comments are gratefully acknowledged from Bert Hofman, Deepak Mishra, Ha Nguyen, Sudhir Shetty, and Ekaterine Vashakmadze. The team would also like to thank Tianshu Chen, Li Li, Xiaoting Li, Lin Yang, and Ying Yu for support in the production and dissemination of this report. The findings, interpretations, and conclusions expressed in this report do not necessarily reflect the views of the Executive Directors of the World Bank or governments they represent. Questions and feedback can be addressed to Li Li ([lli2@worldbank.org](mailto:lli2@worldbank.org)).

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## Executive Summary

Economic activity in China remains resilient, with GDP growing by 6.9 percent in 2017 and 6.8 percent year on year (yoy) in the first quarter of 2018. Consumption continues to drive growth, while net exports, which led the growth acceleration in 2017, were not a source of growth in Q1 2018. From the production perspective, “new economy” sectors are becoming a more prominent source of growth. Despite their small GDP share, software and IT services are rising at double-digit rates and contributed 1.1 percentage points to growth in Q1 2018.

While China is on a long-term path of slower capital accumulation, investment growth has rebounded from the lows in 2017, particularly in the private sector. In the decade before 2011, real investment expanded by 18.0 percent per year, while in 2017 it grew by just 5.5 percent. Structural causes of the slowdown include China’s rebalancing away from investment toward consumption. Efforts to reduce industrial overcapacity and to lower financial risks have also affected investment decisions. The level and growth rate of investment are still high by international standards. Evidence suggests that the efficiency of allocation, and not the speed of growth, is China’s main investment challenge.

China’s current account balance continues to fall as exports play a smaller role in GDP growth. Mainly due to stronger goods and services imports, the surplus declined to 1.3 percent of GDP in 2017 and moved into a small deficit in Q1 2018. In 2017, China also experienced more balanced capital flows, though unrecorded outflows exceeded US\$200 billion. Nevertheless, the Renminbi has continued to appreciate, weathering the emerging market turbulence in mid-April 2018 relatively well.

Monetary and regulatory tightening has already shown some results. The level of corporate debt stabilized below 160 percent of GDP in 2017. Several new measures, including an overhaul of the rules for asset management products (AMPs), indicate the authorities’ commitment to addressing financial vulnerabilities.

Fiscal policy was accommodative in 2017, with growth in local government capital spending particularly strong. However, some of the increase in budgetary spending likely compensated for lower off-budget investments as implicit public borrowing through LGFVs was restricted. While the projected 2018 consolidated fiscal deficit is similar to that in 2017, a stricter enforcement of measures to limit off-budget borrowing for public projects will likely imply a further tightening in the overall fiscal stance.

In the base case, growth will moderate to 6.5 percent in 2018 and 6.3 percent in 2019-20. Several factors are expected to slow the pace of economic activity: a relatively tighter monetary and fiscal policy mix, more moderate growth in global trade, continuing reforms to address industrial overcapacity and environmental sustainability, and measures to reduce the macroeconomic vulnerabilities accumulated in recent years. Rebalancing toward more consumption-and-services-led growth is also expected to continue.

The main risks to the outlook are high corporate indebtedness and rising trade tensions. The economic impact of recently announced US trade measures would be manageable, but the costs of investment restrictions—in terms of limited access to technology and skills—could be significant. The greater risk for China and the world economy would be a major weakening of the rules governing global trade and investment and unraveling of global value chains. A measured response to the trade measures, consistent with World Trade Organization (WTO) rules, and continued dialogue with the US can minimize this risk.

Five years ago, China made green development one of its core development principles. A considerable share of soil, including arable land, is contaminated and affects food safety and food security, water pollution, and public health through direct exposure. A World Bank study demonstrates the advantages of a step-by-step remediation and redevelopment strategy which links contamination extent and future land use. The estimates suggest cost savings of up to 80 percent and higher health and ecological benefits compared to China’s current practices.

## A. Recent Economic Developments and Outlook

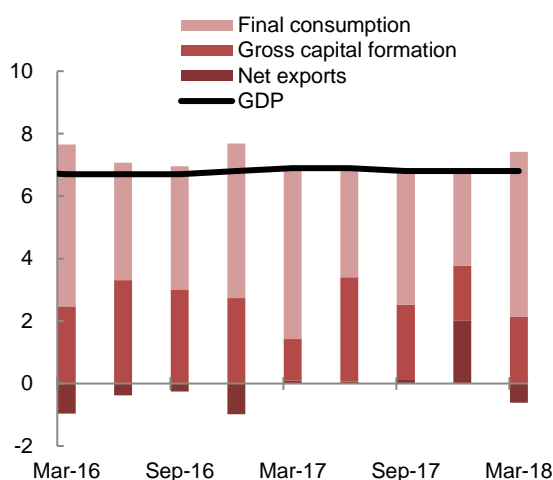
### 1. Growth remains strong amid a rebound in investment

Economic activity remains resilient, with GDP growing by 6.8 percent year on year (yoy) in the first quarter of 2018, after increasing by 6.9 percent in 2017. Exports led the growth acceleration in 2017, in particular in the final quarter (Figure 1). In Q1 2018, final consumption contributed strongly to growth, as it usually does each first quarter of the year. In contrast to 2017, net exports were not a source of growth in the first quarter. Given that the trade recovery began in the first quarter of last year, some of the weakness in net export growth in Q1 2018 was likely due to a high base effect. According to monthly customs data, import growth was somewhat stronger than export growth in the first quarter.

Investment growth, in particular in the private sector, rebounded in Q1 2018. Gross capital formation contributed 2.1 percentage points to year-on-year GDP growth, compared with 1.8 in Q4 2017 and 1.3 in Q1 2017. Though there are important differences between the capital formation and fixed-asset investment (FAI) data (see Section B.1), the available FAI data corroborate the improvement in gross capital formation growth. Total real FAI rose by 1.2 percent yoy in Q1, up from -5.3 in the previous quarter (Figure 2). Real private FAI also picked up, from -6.7 percent yoy in Q4 2017 to 2.7 in the latest quarter.

**Figure 1: Contributions to real GDP growth**

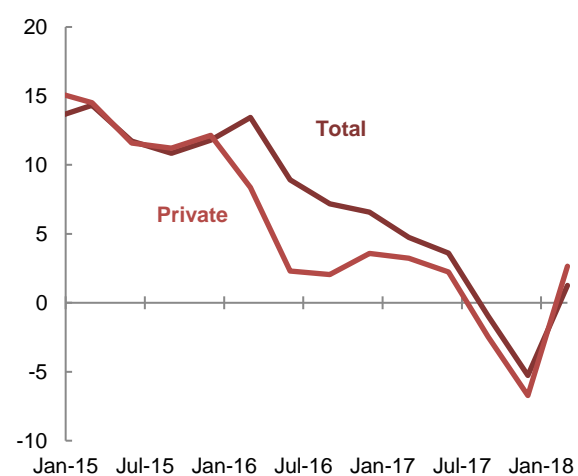
(percentage points yoy)



Source: National Bureau of Statistics (NBS), World Bank staff calculations.

**Figure 2: Real FAI growth**

(percent yoy)



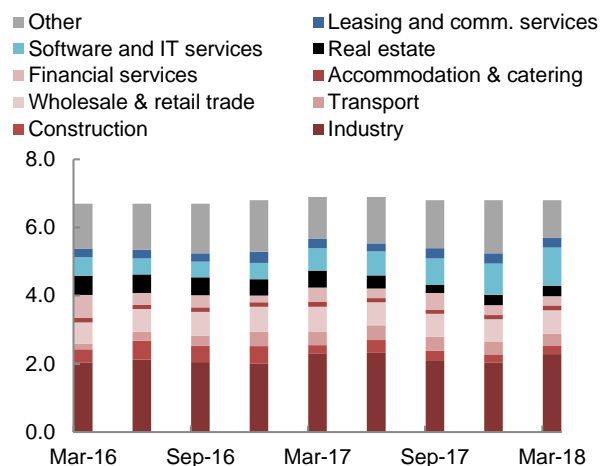
Note: Real FAI is FAI deflated by the overall FAI price index.  
Source: NBS, World Bank staff calculations.

From the production perspective, software and IT services contributed notably more to GDP, while the growth contributions of construction, real estate, and financial services have stabilized at lower levels. Although the share of software and IT services in the economy is still low at less than 8 percent of GDP, very high growth rates (26 percent in 2017) have meant increasingly high contributions to growth. This sector contributed half a percentage point to growth in 2016 and 1.1 percentage points in Q1 2018 (Figure 3). Macroeconomic policies targeted at reining in the rapid rise in corporate leverage have been effective in restraining growth in construction, real estate, and financial intermediation in recent quarters. Industry growth remains better than in 2016, but the contribution of manufacturing seems to have weakened somewhat in the first quarter of 2018.



Figure 3: Contributions to real GDP growth

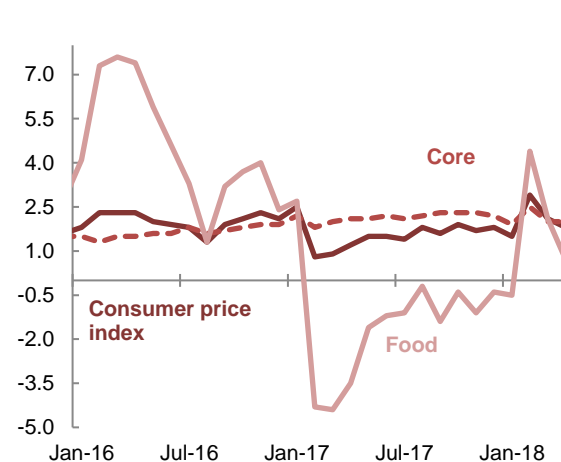
(percentage points yoy)



Source: NBS, World Bank staff calculations.

Figure 4: Monthly change in consumer prices

(percent yoy)



Source: NBS, World Bank staff calculations.

With the end of food price deflation, consumer prices have risen at a higher pace in recent months. Consumer prices increased by an average of 2.1 percent yoy in the first four months of 2018 (Figure 4). By comparison, CPI inflation was 1.6 percent in 2017. The main reason for higher inflation is rising food prices, while service price inflation has remained stable. In year-on-year terms, food prices increased by an average of 1.7 percent in January-April 2018. Given steady domestic demand, core inflation has remained broadly stable, at 2.2 percent in 2017 and 2.1 percent yoy in the first four months this year. Producer price inflation moderated to 3.6 percent yoy in early 2018, down from 6.3 percent last year when commodity prices provided a significant boost.

## 2. Trade and capital flows have become more balanced

As exports play a smaller role in GDP growth, the current account balance continues to weaken. In 2017, the current account surplus declined to 1.3 percent of GDP, from 1.8 percent in 2016 (Figure 5). A key driver of the decrease were stronger imports of both goods and services which led to a decline in the trade surplus of US\$45 billion (0.4 percent of GDP) in 2017. In Q1 2018, the current account moved into a deficit of US\$28 billion, or 0.9 percent of quarterly GDP, for the first time since Q2 2001. While goods exports were somewhat weaker compared to Q1 2017, strong imports, in particular of machinery and equipment, explain most of the goods trade deficit. A higher service trade deficit, driven by China's higher spending on outbound travel and intellectual property royalties, also contributed to the current account deficit.

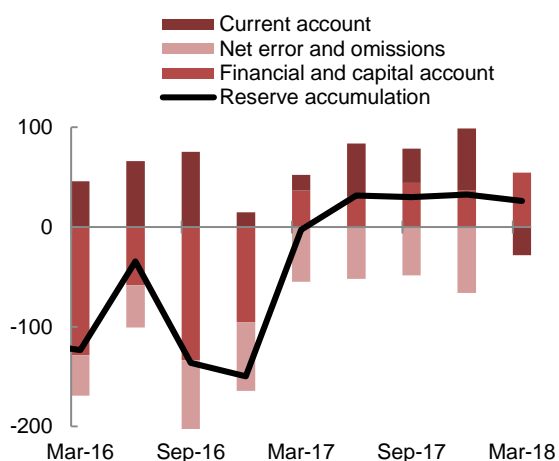
In 2017, China also experienced more balanced capital flows, though large unrecorded outflows (reported as errors and omissions in the balance of payments) persisted. Owing to better investor sentiment, as well as stricter capital controls, net capital outflows (including errors and omissions) declined from US\$646 billion in 2016 to US\$73 billion in 2017. In Q1 2018, net capital inflows are estimated at US\$54 billion. While net flows in the financial account turned positive last year, errors and omissions remained at US\$-222 billion, a level similar to that in 2016. This suggests that there is still a preference among residents to diversify assets globally.

While short-term capital inflows increased last year, foreign direct investment (FDI) has continued to face challenges. Portfolio outflows remained stable at slightly over US\$100 billion in 2016 and 2017, while portfolio inflows more than doubled to US\$117 billion in 2017 (Figure 6). With higher quotas for the Stock Connect, Qualified Domestic Institutional Investor (QDII), and Qualified Domestic Limited Partnership

(QDLP) schemes Chinese investors will be able to allocate more assets abroad this year. Similarly, more open financial markets in China and the country's inclusion in the MSCI equity and Bloomberg-Barclays bond indices are likely to bring more non-resident portfolio investments. After three years of significant outflows, bank lending also turned into an inflow of US\$74 billion in 2017. Inbound FDI remained at about US\$170 billion in both 2016 and 2017. Outbound FDI declined from US\$216 billion in 2016 to US\$102 billion in 2017, owing both to restrictions imposed by Beijing on certain types of foreign acquisitions and to a reduced appetite for Chinese direct investment in recipient countries.

Figure 5: Components of the balance of payments

(USD billion)

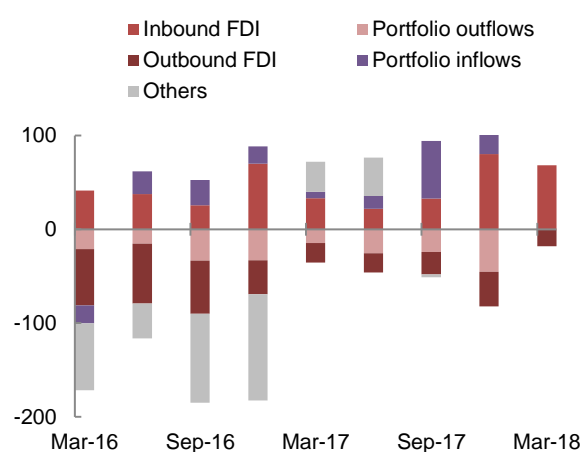


Note: Preliminary numbers for Q1 2018.

Source: SAFE, World Bank staff calculations.

Figure 6: Composition of capital flows

(USD billion)



Source: NBS, World Bank staff calculations.

Starting in December 2016, the Renminbi has continued to appreciate, weathering the recent emerging market turbulence relatively well. When capital flows stabilized in 2017, the value of China's currency increased by 5.8 percent against the US dollar and remained stable against the trade-weighted (CFETS) basket of currencies. The Renminbi depreciated by 1.5 percent against the US dollar between April 18 and May 10 this year, when rising US bond yields and a stronger US dollar triggered a reversal in portfolio flows to emerging markets. By comparison, the JP Morgan Emerging Markets Currency Index lost 4.0 percent of its value over the same period and countries with significant external vulnerabilities experienced much larger depreciations. Year to date, the Renminbi is still up 2.4 percent against the US dollar and 2.8 percent against the CFETS basket.

### 3. Corporate leverage has stabilized in recent months

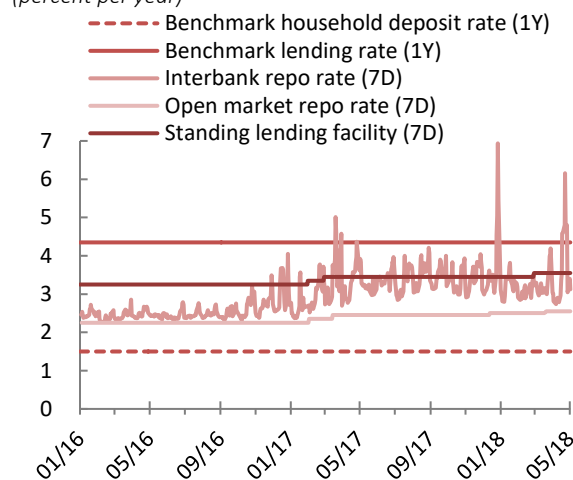
Monetary policy has become more differentiated in recent months, as the People's Bank of China (PBOC) likely aims to ensure a smooth deleveraging process. Following the US Federal Reserve interest rate hike, the PBOC raised its policy rates by 5 basis points in March 2018 (Figure 7). Then on April 25, the central bank reduced the reserves that banks are required to maintain at the PBOC by 1 percent of liquid liabilities. After accounting for maturing medium-term lending facility loans, the cut in required reserves led to an estimated net liquidity provision of around RMB 400 billion (or 0.5 percent of GDP). By reducing the need for banks to borrow from the PBOC, lower required reserves are likely to decrease the cost of funding for banks. Overall, the central bank provided net liquidity of RMB 274 billion in the first four months of 2018, compared with RMB 825 billion during the same period of 2017 (Figure 8). Market interest rates have risen



slightly and remain volatile. Higher rates, combined with careful liquidity management, would support orderly deleveraging.

**Figure 7: PBOC policy and interbank rates**

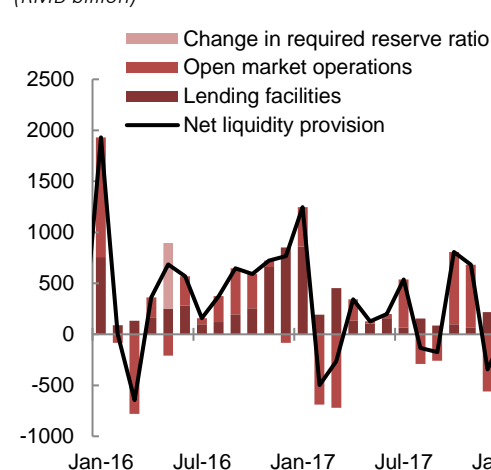
(percent per year)



Source: PBOC, World Bank staff calculations.

**Figure 8: PBOC liquidity provision**

(RMB billion)



Source: PBOC, World Bank staff calculations.

**Financial regulators stepped up efforts to slow down the pace of leveraging with continued focus on shadow banking.** In April, new rules for asset management products (AMPs), unified across regulators, were announced.<sup>1</sup> These include restrictions on new wealth management products (WMPs) offered to the public: they can only be invested in “standard assets,” primarily publicly-traded stocks or bonds. AMPs should generally be valued on a net-asset-value basis that makes risks to investors more transparent and reduces the scope for implicit guarantees. The new rules are expected to reduce regulatory arbitrage through the harmonization of AMP standards, strengthen disclosure, and better protect investors. In addition to revising AMP regulation, the authorities tightened rules on the funding and use of entrusted loans, a key component of non-bank credit. Entrusted loans can no longer be funded through bank credit or AMPs and cannot be invested in equities or lent to borrowers in restricted industries, such as overcapacity sectors and property. New guidance also discourages banks from using short-term market funding for longer-maturity investment in structured products and restricts investment in structured products for which counterparty risks cannot be clearly identified.<sup>2</sup>

**Given these monetary and regulatory policies, credit growth continued to moderate.** Total credit to the non-financial sector<sup>3</sup> increased by 12.5 percent yoy in the first four months of 2018, compared to 13.6 percent for 2017 and 15.8 in 2016. While growth in bank loans has been broadly stable, growth in non-bank financing<sup>4</sup> moderated significantly from 9.7 in 2017 to an average of 6.5 percent yoy in January-April 2018. Entrusted loans and banker's acceptance bills contributed to most to the slowdown in non-bank financing. The stock of WMPs issued by banks grew by 1.7 percent in 2017, significantly down from 23.6 percent growth in 2016. The deceleration in issuance of WMPs was particularly sharp for joint stock (i.e., publicly traded) and city commercial (mainly majority state-owned) banks.

<sup>1</sup> The new rules are effective immediately, though some rules will be implemented gradually through the end of 2020 to prevent liquidity shocks.

<sup>2</sup> Structured products for which counterparty risks cannot be clearly identified should not exceed 15 percent of banks' Tier 1 capital (primarily equity capital and disclosed reserves) by the end of 2018.

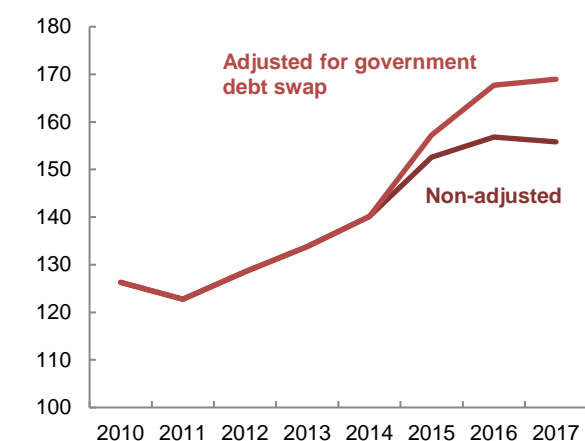
<sup>3</sup> Total credit = total social financing – equity financing + government bonds.

<sup>4</sup> Non-bank financing refers to the non-bank financing components of total social financing as reported by PBOC.

**Leverage in the corporate sector has stabilized.** Credit to non-financial companies stood at 155.8 percent of GDP at the end of 2017, down from 156.8 percent in June 2017 (Figure 9). Some of the decline in corporate debt was due to the local government debt swap program. This scheme was introduced in 2015 to convert debt recognized as public debt in local government financing vehicles (LGFVs) into government bonds. If corporate debt is adjusted for the effect of the debt swap program, credit to non-financial corporations would be 169.0 percent of GDP at the end of 2017, compared to 167.7 percent in mid-2017.

**Figure 9: Credit to non-financial corporations**

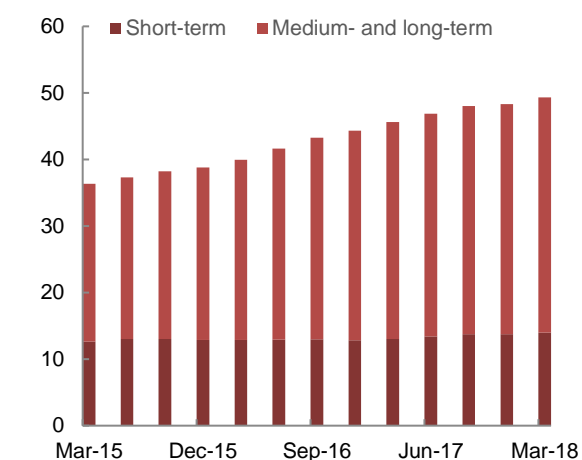
(percent of GDP)



Source: BIS, Ministry of Finance, World Bank staff calculations.

**Figure 10: Household debt**

(percent of GDP)



Source: PBOC, World Bank staff calculations.

**Household indebtedness is still moderate by international standards, but the rapid growth in borrowing is a concern.** Household loans increased by 23.3 percent in 2016 and 21.3 in 2017, decelerating further to 19.9 percent yoy in the first quarter of 2018. High growth in 2016 was driven primarily by mortgage loans. Since late 2016, the authorities have introduced macroprudential policies to cool the housing market. In addition to standard measures, such as lower loan-to-value ratios for mortgages, regulators have also undertaken investigations into the illicit use of personal consumption loans to finance property down payments. Although these measures are likely to have contributed to slower expansion in household borrowing, loan growth remains high. Household leverage continues to rise, reaching 49.3 percent of GDP in March 2018 (Figure 10).<sup>5</sup> This is higher than in many large emerging markets, but well below the ratio in advanced countries and in some of China's middle-income neighbors like Malaysia (84 percent) and Thailand (78 percent).<sup>6</sup>

#### 4. Measures limiting off-budget debt may lead to weaker fiscal expansion

Annual data from the Ministry of Finance shows that fiscal policy was accommodative in 2017, with growth in local government investment project spending particularly strong. In 2017, both revenues and expenditures in the Public Finance Budget<sup>7</sup> increased by 9.5 percent, with tax collection driving the former

<sup>5</sup> Note: Household debt includes "operation" loans which are intended for business operation purposes. If these are excluded, household debt to GDP would be 11 percentage points lower in March 2018.

<sup>6</sup> Data for Malaysia and Thailand are from CEIC.

<sup>7</sup> China's budget system consists of (i) Public Finance Budget which includes tax and non-tax revenues, current expenditures, and a portion of capital expenditures; (ii) Government Fund Budget which reflects mainly land-lease revenues of local governments and expenditures for specific infrastructure and social projects; (iii) Social Security Fund Budget which records social insurance premiums, subsidies, and disbursements; and (iv) SOE Fund Budget which is the state-owned assets operation budget.

(Table 1). Owing to high land-lease income, revenues in the Government Fund Budget rose by 21.4 percent. Local government spending (mainly on investment) recorded in the Fund Budget grew by 29.6 percent, up from 10.6 percent in 2016. The combined effect of all items in the budget system contributed to a consolidated fiscal deficit of 3.7 percent of GDP in 2017,<sup>8</sup> compared with 3.2 percent in the previous year. However, some of the extra budgetary spending likely compensated for reduced off-budget investments as implicit public borrowing through LGFVs was restricted.

Table 1: Government finance

<i>(RMB billion unless otherwise noted)</i>	2016	2017	2018 Budget	Jan-Apr 2018
<b>Public Finance Budget</b>				
<b>Revenues</b>	<b>16,682</b>	<b>18,271</b>	<b>18,603</b>	<b>6,902</b>
Central government	7,236	8,112	8,536	3,323
Local government (excludes transfers from central budget)	8,719	9,145	9,782	3,579
Withdrawal from Stabilization Fund	727	1,014	285	
<b>Expenditures</b>	<b>18,862</b>	<b>20,651</b>	<b>20,983</b>	<b>6,569</b>
Central government (excludes transfers to local governments)	2,740	2,986	3,247	896
Local government	16,044	17,347	17,736	5,673
Contribution to Stabilization Fund	78	318	0	
<b>Fiscal balance</b>	<b>-2,180</b>	<b>-2,380</b>	<b>-2,380</b>	<b>333</b>
<b>Fiscal balance (% of GDP)</b>	<b>-2.9</b>	<b>-2.9</b>	<b>-2.6</b>	<b>0.4</b>
<b>Government Fund Budget</b>				
<b>Revenues</b>	<b>5,087</b>	<b>6,177</b>	<b>7,805</b>	<b>2,056</b>
Land-lease revenues	3,746	5,206		1,796
Local government special bond issuance	400	800	1,350	
Net withdrawal from Stabilization Fund	25	30	39	
<b>Expenditures</b>	<b>4,685</b>	<b>6,070</b>	<b>7,805</b>	<b>1,621</b>
<b>Social Security Fund</b>				
<b>Revenues</b>	<b>435</b>	<b>643</b>		
Revenues	4,827	5,538		
Expenditures	4,392	4,895		
<b>SOE Management Fund</b>				
<b>Revenues</b>	<b>43</b>	<b>57</b>	<b>56</b>	
Revenues	260	258	284	
Expenditures	217	201	227	
<b>Consolidated fiscal balance*</b>	<b>-2,374</b>	<b>-3,100</b>	<b>-3,354</b>	<b>229</b>
<b>Consolidated fiscal balance (% of GDP)</b>	<b>-3.2</b>	<b>-3.7</b>	<b>-3.7</b>	<b>0.3</b>
<i>Memo: Nominal GDP**</i>	74,413	82,712	90,200	90,200

Note: \*The consolidated fiscal balance = Public Finance Budget balance + Government Fund Budget balance + Social security and SOE Fund net revenues - Net contribution to Stabilization Fund. The consolidated balance of the 2018 Budget assumes net Social Security Fund revenues unchanged from 2017 (RMB 643 billion). The estimated consolidated balance for Jan-Apr 2018 assumes a contribution to the Stabilization Fund, local government special bond issuance, Social Security and SOE Fund net revenues equal to one third of the (assumed) Budget targets. \*\* World Bank forecast for 2018.

Source: Ministry of Finance, World Bank staff calculations.

In the first four months of 2018, overall revenue growth improved slightly and expenditure outturns weakened somewhat, resulting in a small fiscal surplus. Revenues in the Public Finance and Government

<sup>8</sup> See the note to Table 1 for the definition of the consolidated fiscal balance.

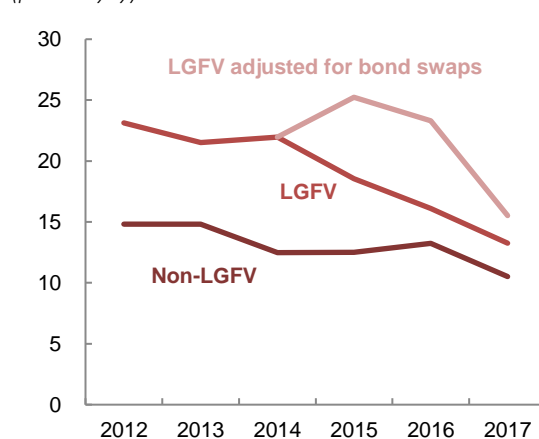
Fund Budgets increased by 17.0 percent yoy in January-April 2018, up from 15.5 in the same period last year. However, revenue outturns varied by category. Driven by lower profit growth, corporate income taxes increased by 13.0 percent yoy in January-April 2018, compared with 18.5 percent yoy a year earlier. The cuts in corporate income taxes, introduced this year to support businesses, could also have contributed somewhat to lower tax collection (see Box 1). Growth in property-related taxes also declined relative to early 2017, owing to a weaker real estate market. Land-lease revenues rose by 40.7 percent yoy, up from 33.9 percent yoy a year earlier. Overall expenditures rose by 16.3 percent yoy in the first four months, compared with 17.4 percent yoy in January-April last year, with high growth in capital spending by local governments recorded in the Government Fund Budget. In the year to April, the consolidated fiscal balance was an estimated 0.5 percent of GDP.

**The 2018 Budget is consistent with a projected consolidated fiscal balance similar to that in 2017.** The 2018 deficit target for the Public Finance Budget was lowered to 2.6 percent of GDP from 2.9 percent in 2017. At the same time, the deficit target for the investment-oriented Government Fund Budget was set at about 0.6 percentage points of GDP higher. The special bond quota for local governments was raised by RMB 550 billion to RMB 1.35 trillion. Adding all four budgets together, the projected consolidated deficit, at 3.7 percent of GDP, would be equal to that in 2017.<sup>9</sup>

**However, measures to reduce off-budget borrowing are expected to tighten the overall fiscal stance this year.** To strengthen the implementation of the 2014 Budget Reform, in the second half of 2017 the government began to enforce more strictly the ban on off-budget borrowing for public projects. Additional guidelines issued in February 2018 tightened significantly the conditions under which LGFVs can borrow through the corporate bond market. Land use rights for reserved land or public facilities can no longer be used as collateral for such bonds. LGFVs cannot issue any statements of association with a local government when issuing bonds. Furthermore, LGFV bonds cannot be used to finance purely public projects. To facilitate the shift from implicit public borrowing to explicit local government borrowing, the government has allowed an expanded use of subnational project bonds, including shantytown redevelopment bonds that are to be piloted this year, in addition to the local land reserve and toll road bonds introduced in 2017. If these measures are successfully implemented, overall fiscal policy, both on- and off-budget, could be less expansionary than in 2017.

**Managing local government debt remains challenging, though the situation has improved somewhat since 2016.** In March 2018, local government direct debt was 16.6 trillion RMB, or 19.6 percent of GDP, down from 19.9 percent of GDP at the end of 2017. Growth in the liabilities of LGFVs has also started to moderate but remains high. According to Wind Info data, the liabilities of LGFVs that have issued bonds, corrected for the bond swap program explained above, rose by about 16 percent in 2017, compared with over 20 percent a year in 2012-2016 (Figure 11).

**Figure 11: Growth in corporate liabilities**  
(percent yoy)



Source: NBS, Wind Info, World Bank staff calculations.

<sup>9</sup> According to the 2018 Budget, the planned withdrawal from the Stabilization Fund is also lower.

**Box 1: Recent tax incentives and their likely effect on corporate investment**

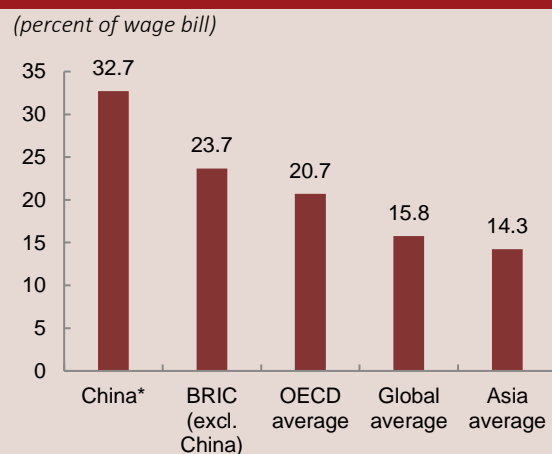
In early 2018, the government introduced fiscal measures to support consumption, certain business sectors, small firms, and R&D and investment. The value-added tax (VAT) rate was lowered by 1 percent for manufacturing (to 16 percent), transportation, construction, basic telecommunication services, and farm produce (to 10 percent). The threshold for small-scale tax payers eligible for a preferential VAT rate of 3 percent was raised to RMB 5 million of annual sales, from RMB 0.5-0.8 million previously. The annual taxable income threshold of small and micro businesses eligible for a lower income tax rate was raised from RMB 0.5 to RMB 1 million. The tax deductions for new equipment and R&D were also increased from RMB 1 million to RMB 5 million. The government estimates that these policies would reduce the corporate tax burden by about 0.5 percent of GDP in 2018.

These tax incentives were introduced at a time when the government is also reducing capital spending and restricting off-budget borrowing by local governments. In China, fiscal policy has historically placed strong emphasis on infrastructure spending. In recent years, the returns to public investment have started to decline and local government debt sustainability has become a concern (World Bank, 2017b). The 2018 Budget indicates reduced spending on large infrastructure projects. For example, railway investment will decline by 8.5 percent and highway investment stay flat compared to 2017. A lower corporate tax burden is better aligned with alleviating financial risks and with allocating resources away from public infrastructure toward private investment.

Empirical evidence suggests that investment tax incentives have been effective in China. A study of China's 2004 VAT reform pilot that introduced a permanent 17-percent tax credit for fixed investment in six industries in the Northeastern region found that the tax credit raised firm investment by 28 percent (Zhang et al., 2017). An analysis of China's listed companies over 2007-2013 showed that tax incentives stimulated R&D expenditure, in particular in private firms (Jia and Ma, 2017).

Relative to other components of the corporate tax burden, China's VAT and corporate income tax rates are not high. China's VAT rates range between 11 and 16 percent. By comparison, the average VAT rate in the OECD was 19 percent in 2016.<sup>10</sup> China's statutory corporate income tax rate is 25 percent, compared with an average of 22 percent for the OECD.<sup>11</sup> Despite recent reforms, China's social security taxes paid by employers remain high by international standards. Contributions for pensions, medical insurance, unemployment insurance, and housing funds account for about 33 percent of the wage bill (Figure 12)<sup>12</sup>. In the OECD, the average employer social security tax rate is 21 percent of the wage bill.<sup>13</sup> Lower social security contributions are one of the planned fiscal measures listed in the March 2018 Government Work Report. Reform in social taxes would lower

**Figure 12: Statutory highest social security contribution rates paid by the employers, 2018**



Note: \*Average for Beijing and Shanghai.

Source: KPMG, PWC, World Bank staff calculations.

<sup>10</sup> OECD, <http://www.oecd.org/tax/tax-policy/tax-database.htm#VATTables>

<sup>11</sup> OECD, [http://stats.oecd.org/index.aspx?DataSetCode=TABLE\\_I11](http://stats.oecd.org/index.aspx?DataSetCode=TABLE_I11)

<sup>12</sup> PWC, <http://taxsummaries.pwc.com/ID/Peoples-Republic-of-China-Individual-Other-taxes>

<sup>13</sup> KPMG, <https://home.kpmg.com/xx/en/home/services/tax/tax-tools-and-resources/tax-rates-online/social-security-employer-tax-rates-table.html>

firm labor costs and increase disposable income, supporting household demand and rebalancing toward consumption.<sup>14</sup>

## 5. External risks have become more prominent

In the base case, the World Bank continues to expect a gradual growth slowdown and orderly economic rebalancing over the medium term. GDP growth is forecast to moderate to 6.5 percent in 2018, and further to 6.3 and 6.2 percent in 2019-20 (Table 2). Several factors are expected to slow the pace of economic activity: a relatively tighter monetary and fiscal policy mix, more moderate growth in global trade, continuing reforms to address industrial overcapacity and environmental sustainability, and measures to reduce the macroeconomic vulnerabilities accumulated in recent years. Rebalancing toward more consumption-and-services-led growth is also expected to continue. The growth contribution of exports is forecast to decline and the contribution of domestic demand to rise. The baseline scenario assumes no further escalation in global trade tensions.

**Table 2: Macroeconomic indicators and outlook**

	2015	2016	2017	2018f	2019f	2020f
<b>Real GDP growth, at constant market prices (percent)</b>	6.9	6.7	6.9	6.5	6.3	6.2
<i>Contributions to growth (percentage points):</i>						
Final consumption	4.1	4.5	4.1	4.2	4.2	4.2
Gross fixed capital investment	2.9	2.9	2.2	2.1	2.0	2.0
Net exports	-0.1	-0.6	0.6	0.1	0.1	0.0
<b>Real GDP growth, at constant factor prices (percent)</b>	6.9	6.7	6.9	6.5	6.3	6.2
<i>Contributions to growth (percentage points):</i>						
Agriculture	0.3	0.3	0.3	0.3	0.3	0.3
Industry	2.5	2.5	2.5	2.3	2.2	2.1
Services	3.9	3.8	3.9	3.9	3.8	3.8
<b>Inflation (percent change in Consumer Price Index)</b>	1.4	2.0	1.6	2.2	2.3	2.4
<b>Current Account Balance (% of GDP)</b>	2.7	1.7	1.3	0.8	0.5	0.3
<b>Financial and Capital Account (% of GDP)</b>	-0.8	0.2	0.5	0.6	0.7	0.8
<b>Net Foreign Direct Investment (% of GDP)</b>	0.6	-0.4	0.5	0.5	0.6	0.6
<b>Consolidated fiscal Balance (% of GDP) *</b>	-2.7	-3.2	-3.7	-3.7	-3.3	-3.2
<i>Note: f=forecast. * The consolidated fiscal balance adds up the public finance budget, the government fund budget, the state capital management fund budget and the social security fund budget. Numbers may not add up due to rounding.</i>						
<i>Source: World Bank staff estimates and projections.</i>						

**High corporate indebtedness remains China's main domestic challenge.** Monetary and regulatory tightening since late 2016 has already shown some results, with corporate leverage stabilizing slightly below 170 percent of GDP in 2017. The recent overhaul of AMP regulations is a sign of the authorities' commitment to addressing financial market vulnerabilities. Further opening the financial sector to foreign investors, a timetable for which was announced in April 2018,<sup>15</sup> could increase competition and contribute to greater

<sup>14</sup> Lower pension contributions would have to be part of a wider pension system reform to ensure the financial sustainability of the system.

<sup>15</sup> <https://www.reuters.com/article/us-china-boao-pboc/china-pledges-to-allow-more-foreign-investment-in-financial-sector-by-year-end-idUSKBN1HI074>.



financial discipline. Additional reforms are needed to increase the role of the market in dealing with distressed borrowers. Although firm bankruptcies and corporate debt defaults are on the rise, their number is still small. China's corporate bond default rate was 0.3 percent in 2017, down from 0.9 percent in 2016.<sup>16</sup> According to S&P, the average bond default rate was 1.5 percent in 1981-2016 for their global sample of rated companies.<sup>17</sup>

**In early 2018, policy-makers introduced wide-ranging structural and institutional reforms.** In March, the 13th National People's Congress prioritized support for the "new economy" through improving infrastructure and further deregulation. The SOE reform strategy is to shift from "managing operations" to "managing capital," although the details of what this entails are yet unclear. The authorities also aim to restructure SOEs to facilitate the emergence of globally competitive enterprises. Institutional reforms reduced the number of administrative bodies and combined certain regulatory functions (for example, the banking and insurance regulators). Additional measures include tax cuts aimed to lower the corporate tax burden (see Box 1) and a timeline and specific targets to further open the financial sector and car, ship, and aircraft manufacturing to foreign investment. It would be important to maintain the momentum in reform implementation gained in 2017 to ensure gains in productivity and growth.

**The external risks to the outlook have increased notably in recent months.** External conditions remain favorable, with a strong recovery in advanced countries, robust global trade growth, and financial markets stabilizing after the rise in volatility in mid-April 2018. Nevertheless, escalating trade tensions and higher US interest rates and a stronger US dollar pose significant risks to emerging markets.

**In China, the potential economic impact of announced US trade measures would be manageable.** The impact of the steel and aluminum tariffs announced in March 2018 will be small, as China's exports of these products to the US were already subject to significant duties and quantities were limited. The US also discussed new US tariffs on \$50 billion worth of imports from China, following the inquiry under Section 301 of the Trade Act of 1974 which concluded that China has violated US intellectual property (IP) rights. The impact of these measures would likely be larger. The targeted exports accounted for about 11.5 percent of China's exports to the US (US\$433 billion) and 2.2 percent of China's total exports in 2017. If gross exports of US\$50 billion are adjusted for the value of imported intermediate inputs, then the direct cost to China's economy would be about a fifth of a percent of 2017 GDP.<sup>18,19</sup> Last year, total exports to the US contributed an estimated 2.9 percent to China's GDP in domestic value added terms (Figure 13).

**While harder to quantify, the costs of potential investment restrictions related to the Section 301 investigation could be significant.** Although China's direct investment in the US (US\$17 billion) was 9 percent of total overseas direct investment and less than 0.2 percent of China's GDP in 2016, it is highly concentrated in high-tech sectors: 1/3 in manufacturing, 30 percent in IT services, and 7 percent in scientific research (Figure 14). US direct investment in China was only US\$2.6 billion (less than 2 percent of

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<sup>16</sup> <https://www.bloomberg.com/news/articles/2017-10-22/what-default-china-growth-keeps-lid-on-bond-failure-rate-chart>

<sup>17</sup> S&P, 2017, "Default, transition, and recovery: 2016 annual global corporate default study and rating transitions," <https://www.spratings.com/documents/20184/774196/2016+Annual+Global+Corporate+Default+Study+And+Rating+Transitions.pdf/2ddcf9dd-3b82-4151-9dab-8e3fc70a7035>. US firms comprise almost half the sample.

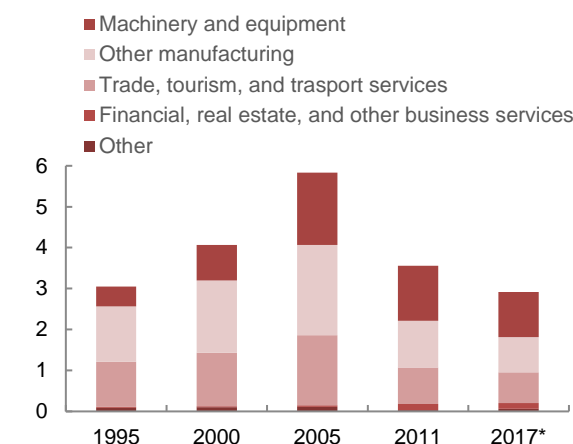
<sup>18</sup> According to data from the OECD Trade in Value Added database (latest data is from 2011), about half the value of China's exports of electrical machinery and computer and electronic equipment and about 30 percent of the value of machinery and equipment and transport equipment are imported inputs. If the estimated value of imported inputs is subtracted from gross exports of US\$50 billion, then the value added produced in China was about 0.2 percent of GDP in 2017. This calculation of the cost to China's economy assumes that China's exports to the US are reduced by the full amount of US\$50 billion.

<sup>19</sup> The negative impact of the measures would also depend on the tariff size, the price elasticity of US import demand and, over time, the likely adjustment in exchange rates and market prices, and the possibility of diversion of some exports to the third countries.

China's total FDI) (according to data from China). Hence, the impact of any restrictions on China's investments in the US and on American firms investing in China (to limit potential technology transfer) could be significant in terms of limiting access to foreign technology and skills.

**Figure 13: Domestic value added content of total exports from China to the US**

(percent of GDP)

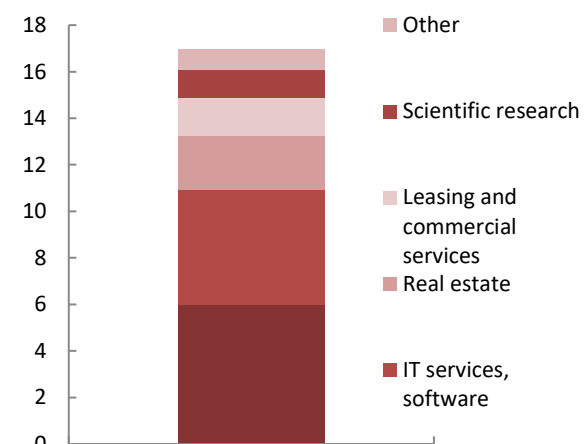


Note: \*2017 estimates use the 2011 share of domestic value added and US trade growth data.

Source: OECD TiVA, US Census Bureau, World Bank staff calculations.

**Figure 14: China's direct investment in the US by sector, 2016**

(US\$ billion)



Source: Ministry of Commerce, World Bank staff calculations.

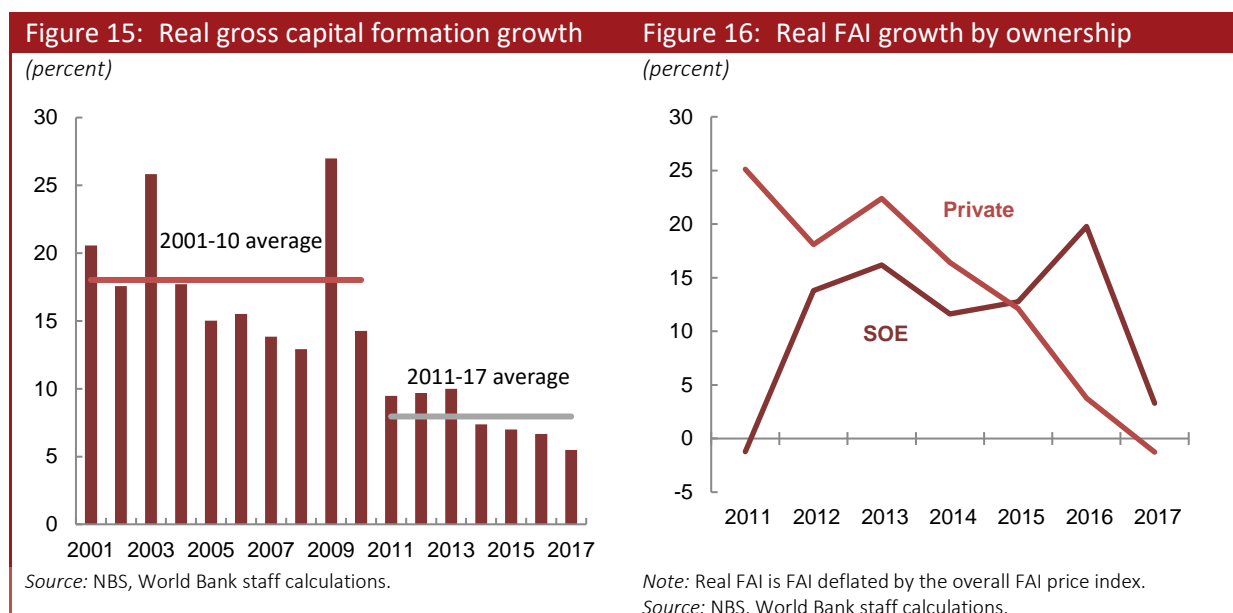
**The greater risk for China and the world economy would be a major weakening of the rules governing global trade and investment and unraveling of global value chains.** China responded to the US announcement by unveiling its own list of US imports subject to tariffs equivalent in value and intensity to the US measure.<sup>20</sup> Meanwhile, China and the US have committed to further trade negotiations and talks have taken place in Beijing and Washington. A measured response to trade restrictions, consistent with WTO rules, and continuing the dialogue with the US administration would minimize the risk of further escalation of tensions. Better enforcement of IP rules, further opening to foreign investment, including in services, and accelerating restructuring of excess capacity industries would help assuage growing concerns over reciprocity in international trade and investment relations. These policies would also contribute to higher-quality growth in China.

<sup>20</sup> [http://gss.mof.gov.cn/zhengwuxinxi/zhengcefabu/201804/t20180401\\_2857769.html](http://gss.mof.gov.cn/zhengwuxinxi/zhengcefabu/201804/t20180401_2857769.html)

## B. Medium-Term Development Agenda

### 1. Understanding China's investment slowdown

Investment growth in China has weakened significantly in recent years, growing at less than half its 2001-2010 average pace. In the decade before 2011, real investment expanded by 18.0 percent per year, while its 2017 growth rate was just 5.5 percent (Figure 15). Not only has aggregate investment growth declined, but data on fixed-asset investment (FAI) by ownership type would suggest that the main engine of investment growth in the past, namely the private sector, has been primarily responsible for the recent sharp slowdown (Figure 16). The significant deceleration in investment has raised concerns about the sustainability of investment growth—and economic growth—in the future.



Both structural and short-term factors have contributed to the slowdown, though FAI data may exaggerate the slowdown in private investment. China's "new normal" of slower economic growth is naturally accompanied by slower investment growth, particularly considering the current important process of rebalancing away from investment toward household consumption. In recent years, efforts to reduce excess capacity in certain sectors and to limit financial risks have also had an impact on investment. As for the evidence that very low private investment growth may be driving the current slowdown, this may be in part a statistical artifact (see below).

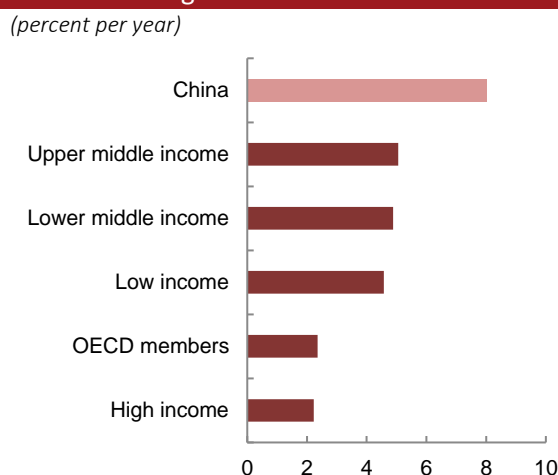
Overall, the evidence suggests that the efficiency of allocation, and not the speed of growth, is China's main investment challenge. In this respect, the authorities could focus on enhancing the ability of the financial system to allocate credit to more productive sectors and firms. That would involve strengthening market discipline and reducing distortions in the pricing of risk by hardening budget constraints in the state sector and improving the legal framework for resolving bad debt. It would also mean that local public investment grows at a more moderate pace in the future.

#### a. Structural change has been an important factor

Despite the recent slowdown, China's investment growth continues to be strong by international and historical comparison. In 2012-2016, fixed capital formation in China increased by an average of 8.0 percent, compared with an average of 5.1 percent for upper middle-income countries (Figure 17). China's

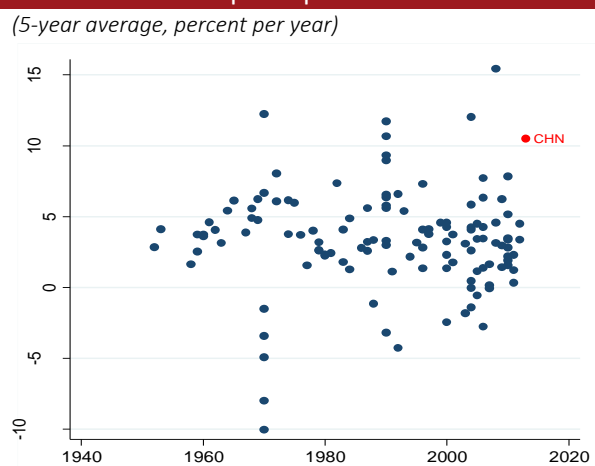
investment growth is also very high when compared historically to countries at the same level of development. In the five years to 2014, physical capital per worker increased faster in China than in almost all nations at the time when they reached China's 2014 income per capita (Figure 18). Japan around 1970 and Korea around 1990 had capital stock growth rates similar to China's today.

**Figure 17: Gross fixed capital formation growth, 2012-16 average**  
(percent per year)



Source: World Development Indicators, World Bank staff calculations.

**Figure 18: Growth in physical capital per worker at China's income per capita level**  
(5-year average, percent per year)

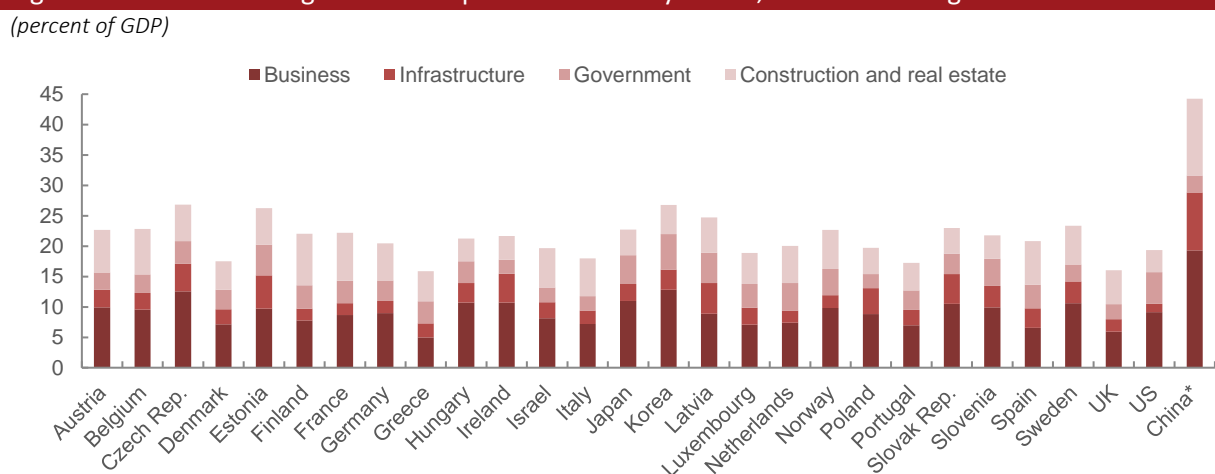


Note: 5-year average growth in capital per worker when a country reached China's 2014 level of PPP GDP per capita.

Source: Penn World Table 9.0, World Bank staff calculations.

**China's investment rate—at 43 percent of GDP in 2017—remains one of the highest in the world.** In recent years, strong investment has been largely driven by a fiscal stimulus introduced in response to the global financial crisis. Government policy prioritized infrastructure spending, which reached an estimated 13.5 percent of GDP in 2016 (Herd, 2017). Given China's already well-developed public infrastructure, additional investments have brought lower returns to growth in recent years (World Bank, 2017b). In addition to infrastructure, China's investment rate is very high in other parts of the economy, including in the business sector (Figure 19). In general, as countries get richer, they accumulate higher levels of physical capital per worker and start running into diminishing returns to the accumulation of more capital.

**Figure 19: Share of real gross fixed capital formation by sector, 2007-16 average**  
(percent of GDP)



Note: \* China estimates from Herd (2017). 2007-15 data for some countries.

Source: Herd (2017), OECD, World Bank staff calculations.

From a structural perspective, the recent decrease in investment growth from double digits in the 2000s to below 7 percent a year since 2015 could be expected. Since the 2008 global financial crisis, economic rebalancing has gained momentum in China. A gradual transition from external to domestic demand and from investment toward consumption is under way. The consumption share of GDP has declined almost every year since the beginning of the reform process in 1978, falling below 50 percent in 2008. That share gradually rose to 54 percent in 2016–17. In addition, new economy sectors such as software and IT and consumer services are generally less capital intensive. Therefore, China's investment slowdown could be consistent with resources being shifted to more productive uses.

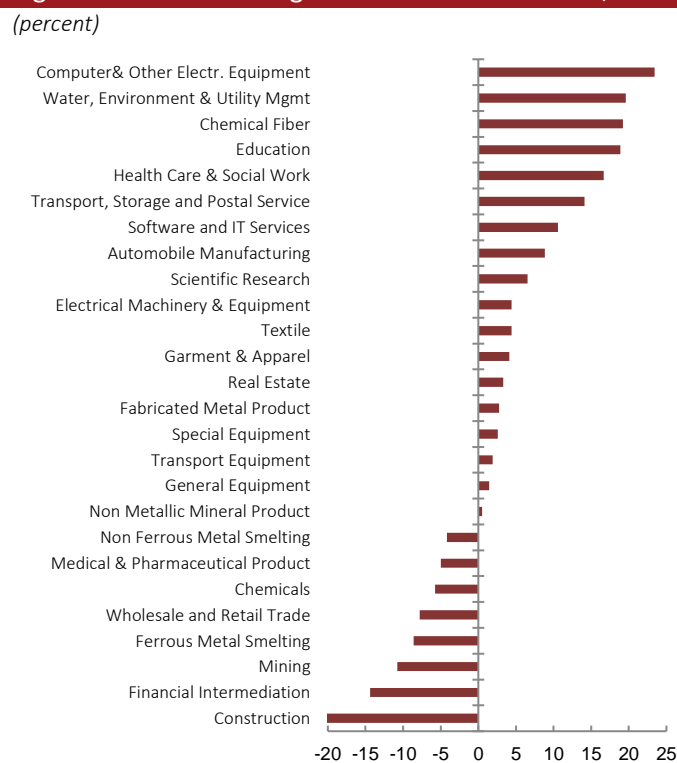
### **b. Recent measures contributed to slower growth and improved allocation of investment**

In addition to long-term trends, a weaker growth outlook, equity market turmoil, and Renminbi devaluation in 2015 lowered business confidence, which contributed to the investment slowdown. In Q3 2015, China's quarterly GDP growth fell below 7 percent for the first time since the global financial crisis. Between June 12, the peak, and August 31, 2015, the Shanghai Composite Index lost 38 percent of its value. The Renminbi depreciated by 6.2 percent against the US dollar between the July 31, 2015 and the end of 2015. In August 2015, the Investors' Confidence Index<sup>21</sup> declined by 18 points to 41.3; the Caixin China Purchasing Managers' Index (PMI) dropped to its lowest level since the 2008 global crisis; and the official PMI fell below the 50-point threshold indicating expectations of slowing economic activity.

Also in 2015, the authorities introduced measures to reduce excess industrial capacity. The government targeted a reduction of 150 million tons of crude steel capacity and 800 million tons of coal capacity over 2016–2020. All metal and other mineral mining and processing, paper, chemicals, and rail, ship and aircraft equipment were also categorized as overcapacity sectors. Furthermore, the authorities strengthened environmental and energy-efficiency standards and their enforcement, limited access to finance for excess capacity sectors, and closed some inefficient SOEs.<sup>22</sup> Investment in most of these sectors has contracted every year since 2015 (Figure 20).

Third, starting in late 2016, the government began introducing policies aimed at curbing the rapid growth in credit. Less accommodative monetary policy, new financial regulations, more comprehensive bank risk monitoring, and improvements in local government budgeting, financing and debt management have contributed to a moderation in debt

**Figure 20: Nominal FAI growth in selected sectors, 2017**



Source: NBS, World Bank staff calculations.

<sup>21</sup> Published by the China Securities Investor Protection Fund Corporation Limited.

<sup>22</sup> See EAP Update, April 2018, Box I.A.3. for an overview of the excess capacity reduction efforts.

growth. Total credit to the non-financial sector increased by 13.6 percent in 2017, down from 15.8 percent in 2016.

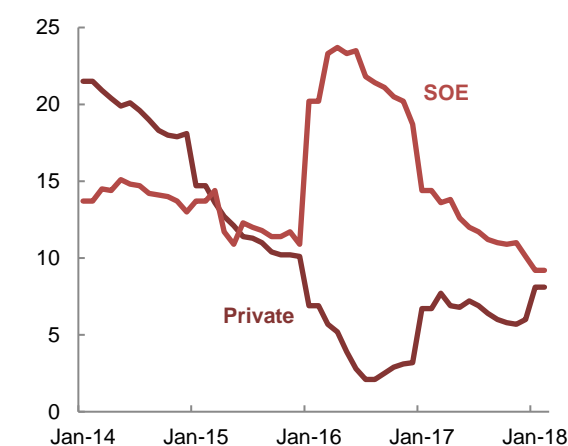
Policies have affected both the growth rate and composition of investment over the past two years. Fixed-asset investment in mining and mineral processing, construction, and financial services declined in 2016 and 2017. At the same time, FAI growth weakened less in equipment manufacturing and remained strong in high-skill manufacturing and service sectors such as computer and communication equipment and IT and software services. FAI in education and health care also expanded significantly.

### c. Measurement of investment may have been affected by ownership reclassification

A notable break in the trend of FAI spending by ownership type occurred at the start of 2016. Monthly real investment by state-owned enterprises (SOEs) increased by an average of 11.5 percent yoy in the second half of 2015, whereas it rose sharply by 20.2 percent in January 2016 (Figure 21). By comparison, private real FAI growth declined from an average of 10.5 percent to 6.9 percent over the same period. In annual terms, the deceleration in private real FAI growth was striking—from 12.1 percent in 2015 to just 3.8 percent in 2016.

Figure 21: Monthly FAI growth

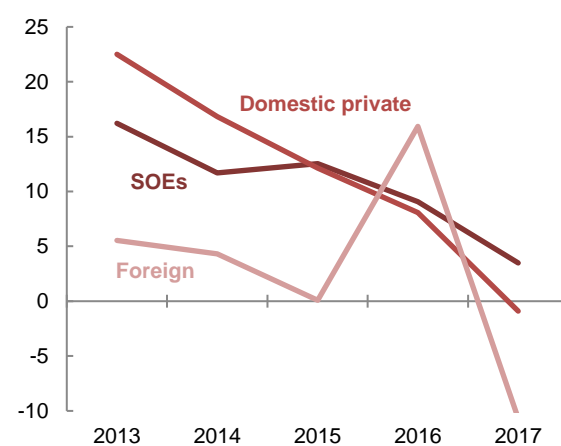
(percent yoy)



Source: NBS, World Bank staff calculations.

Figure 22: Growth in real FAI after adjusting for ownership change

(percent)



Source: NBS, World Bank staff calculations.

At the same time, there were significant changes in the shares of certain types of enterprises in overall FAI. The largest increase— of 6.9 percentage points to 33.4 percent—was for limited liability companies (LLCs). By ownership structure these firms can be wholly, majority, or minority state-owned or private. The changes in FAI shares could reflect changes in ownership structure. For example, the 2015 equity market bailout likely increased the share of state ownership in some LLCs. Even if the increase in the shares was small, say from 49 to 51 percent, these LLCs would be reclassified as state-owned.<sup>23</sup>

One (partial) explanation of the slowdown in private FAI growth in 2016 could be a change in firm ownership. To test this possibility, we calculate the growth rate of FAI keeping the state ownership share constant at its 2013-2015 average value. In this case, both SOE and domestic private real FAI growth decline in 2016,

<sup>23</sup> This paragraph and the next are based on research by the Rhodium Group (2016).



but the fall in the private sector is only slightly worse than the decrease for SOEs (Figure 22). Private FAI growth deteriorated faster in 2017 but the general trend was similar for SOEs.

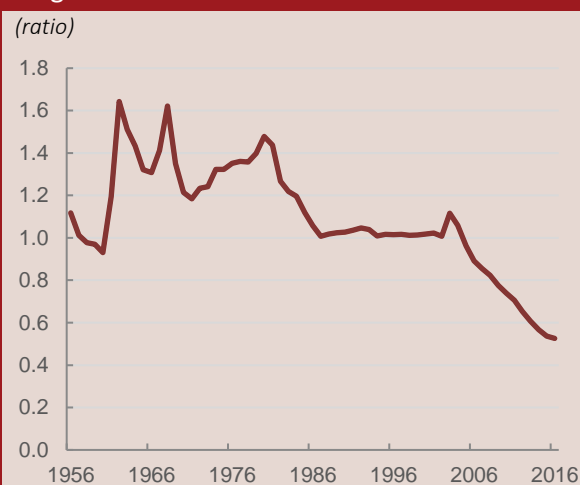
### Box 2: Understanding China's investment statistics

**In the absence of other indicators, FAI provides useful, high-frequency information on the composition of investment in China.** Because NBS does not publish a sectoral breakdown of gross fixed capital formation (GFCF) in the national accounts, analysts commonly rely on FAI. This variable has a monthly frequency and is disaggregated both by ownership (SOE, domestic private, foreign, etc.) and by sector (ferrous metal mining, textile manufacturing, logistic services, etc.). However, using the FAI series to draw conclusions about GFCF may not be ideal. For one, real GFCF growth was 5.5 percent in 2017, whereas real FAI growth was close to zero.

**The gap between the two measures of investment has been increasing in recent years.**<sup>24</sup> The ratio of nominal GFCF to FAI was stable and close to one between the mid-1980s and the early 2000s (Figure 23). Since 2003 the ratio has declined rapidly to 0.53 in 2016.

**FAI and GFCF differ in important ways.** FAI includes purchases of second-hand assets and land, while GFCF accounts only for newly produced capital goods. Most components of FAI which are not part of GFCF are categorized as “Other”. The share of “Other” investment in FAI declined to 12 percent in 2017, from a peak of about 18 percent in 2003. There are two elements of GFCF which, unlike the ones above, will tend to raise the ratio of GFCF to FAI. Residential FAI is measured at the cost of construction and residential GFCF at the selling price (i.e., the difference is the gross margin of property developers). In addition, since 2016 research and development (R&D) spending has been partially reclassified as capital expenditure.

Figure 23: Ratio of GFCF to FAI



Source: Herd (2017).

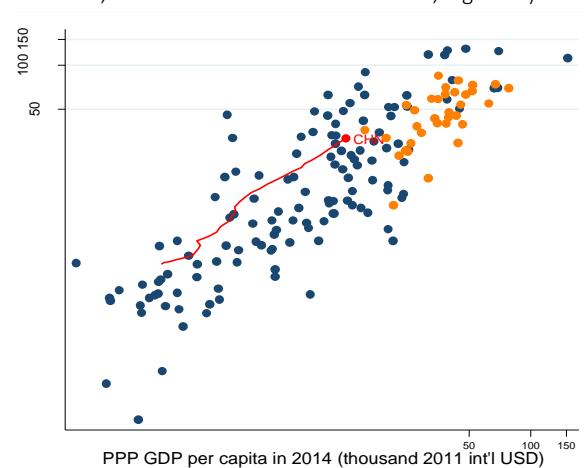
### d. What policies could ensure sustainable investment growth in the future?

Although declining, China's investment growth is still strong, so the main policy challenge is to improve the allocation of capital toward activities with higher returns. Over the past 40 years, China has made such great strides in capital deepening that its government capital stock per worker has already reached OECD levels (Figure 24). This suggests that the economic gains from future high growth in government investment may be limited. But there is scope for rapid growth of private capital. Starting from a very low base in the 1970s, it increased at a remarkable pace but remains considerably below OECD levels (Figure 25).

<sup>24</sup> This analysis is drawn from Herd (2017).

Figure 24: Government capital stock per worker

(China's government capital stock per worker at historical income levels (red line) compared with 2014 levels in other countries, thousand 2011 international USD, log-scale)

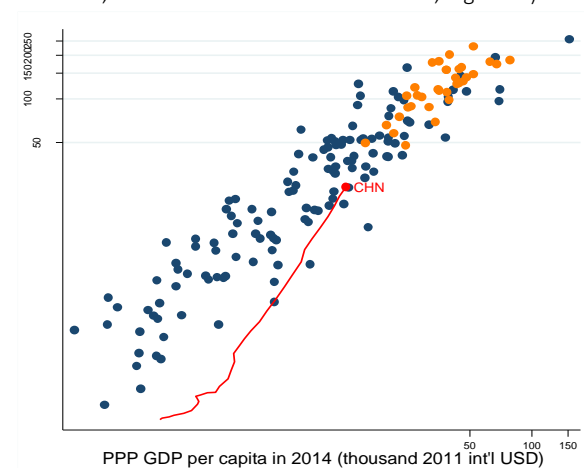


Note: OECD countries in orange.

Source: DRC - World Bank, "Innovative China," forthcoming.

Figure 25: Private capital stock per worker

(China's private capital stock per worker at historical income levels (red line) compared with 2014 levels in other countries, thousand 2011 international USD, log-scale)



Note: OECD countries in orange.

Source: DRC - World Bank, "Innovative China," forthcoming.

**Allowing financial institutions to direct China's high savings to sectors which offer higher returns is one way to improve investment allocation.** This would imply some reallocation of capital from infrastructure and housing to the business sector. Local governments and regional banks have played an important role in supporting the rapid growth of infrastructure investment since the global financial crisis. Further enhancing the incentives and hardening the budget constraints of local governments would increase market discipline and contribute to higher financial market efficiency (World Bank, 2017b). Since late 2016, new regulations and better enforcement of old ones have already led to the re-pricing of financial risk. For example, the yield spread between bonds issued by local government financing vehicles and those issued by the central government increased by more than 100 basis points between September 30, 2016 and the end of 2017.

**Given the high corporate debt burden, the efficiency of investment could also be increased by dealing more effectively with distressed borrowers.** The four national asset management companies currently play a central role but they tend to favor rapid disposal of assets over restructuring. A more effective strategy would be a to restructure the operations of viable firms and facilitate the exit of nonviable ones. Firm restructuring and market exit contribute to more efficient allocation of resources, including capital. Progress has been made in this area, as demonstrated in a higher number of corporate defaults and debt restructuring agreements through creditor committees in 2017, but more reform is needed (World Bank, 2017a).

## 2. How can China best manage its contaminated sites?

Over the past four decades, China has attained unprecedented economic and social gains but at a significant cost to the environment. Real per capita income increased 16 times between 1978 and 2014; more than 850 million people were lifted out of poverty; over half of its population now lives in cities; and the country is the second largest economy in the world today. However, only 11 of 74 cities that monitor air quality meet national standards for air quality; 30 percent of major rivers are polluted; and about 20 percent of agricultural land, 35 percent of industrial land, and 33 percent of mining areas are contaminated. There are serious consequences for public health, quality of life, and sustainability of natural resources. Land contamination in particular affects food safety and food security, water (particularly groundwater) pollution, and public health through direct exposure. The cost of environmental degradation and resource depletion in China is estimated at about 10 percent of GDP (World Bank, 2013).

Environmental sustainability is a clear priority for the government but achieving it is costly and would require a considerable change in current practices. Green development is one of five core development principles in the 13th Five Year Plan and was strongly emphasized during the 19<sup>th</sup> Congress of the Communist Party of China in October 2017 and the National People's Congress in March 2018. With regards to soil contamination, the 2016 Action Plan for Soil Pollution Prevention<sup>25</sup> committed the country to safe use of 90 percent of its land by 2020. However, achieving the green development targets using China's current approach could be very expensive. The China Green Finance Committee estimates the cost of reaching the 2020 goals at over US\$320 billion a year and expects that the government will be able to contribute only 10-15 percent of all green investment.<sup>26</sup>

China's ambitious environmental goals and the high costs associated with reaching them call for a robust and innovative technical, institutional, and financial model. China can learn from international experience to forward the green development agenda by (a) better prioritizing expenditures through a cost-benefit analysis that assesses risks; (b) assigning clear responsibility for soil pollution to land owners and users; (c) strengthening the regulatory environment; (d) including contaminated land management in the urban and spatial planning process; and (e) tapping non-government financing and risk-sharing in cases of expected future commercial viability.

### a. The scale of the site remediation task is significant

Aggregate data on soil conditions suggest that there is a large number of contaminated or potentially contaminated sites. According to a 2014 survey by the Ministry of Environmental Protection (MEP), the share of soil samples which exceeded the screening threshold was 16.1 percent. Among these, 11.2 percent showed slight pollution levels, 2.3 percent light, 1.5 percent moderate, and 1.1 percent severe. Contaminated soil is most evident in the Yangtze River Delta, Zhujiang River Delta, and the former industrial bases in the North East (Figure 26).

Very high levels of contamination are typically found at industrial sites and in mining areas. 36.3 percent of soil samples in heavily polluted industrial land and 34.9 percent in abandoned industrial areas exceeded the screening threshold in the survey. Contamination levels are high and span tens of meters in depth; often the groundwater is also seriously contaminated (Figure 27). 20 million hectares of farmland are also polluted. 33.4 percent of soil samples taken from 70 mining areas exceeded the standard values. Contaminants vary by (former) land use and include pesticides, benzene series, chlorinated hydrocarbons,

<sup>25</sup> [http://dcz-china.org/wp-content/uploads/2016/12/20161031\\_National-Soil-Action-Plan\\_GIZ\\_ENG.pdf](http://dcz-china.org/wp-content/uploads/2016/12/20161031_National-Soil-Action-Plan_GIZ_ENG.pdf)

<sup>26</sup> Green Finance Task Force, "Establishing China's green financial system," <https://www.cbd.int/financial/privatesector/china-Green%20Task%20Force%20Report.pdf>

polycyclic aromatic hydrocarbons (PAHs), petroleum, heavy metals (e.g., cadmium, nickel, copper, arsenic, mercury, lead), and dichlorodiphenyltrichloroethane (DDT). Heavy metals discharged by mining and dressing activity through waste gases, wastewater, tailing ponds, waste ores, etc. have caused extensive ecological damage and pollution in surrounding farmlands.

**The nature and distribution of contamination varies and soil remediation requires the use of different planning approaches.** There are different types of contaminated sites: from small isolated ones, to many sites located within a city, to complex sites such as large former steel works. Cities in China are experiencing a shift in economic structure from traditional manufacturing to services and skill-intensive manufacturing. This, combined with urban sprawl and attempts to move industries away from city centers, leaves behind former industrial sites with contamination problems. In addition, many active industries continue to pollute, with pollution prevention and early warning systems and enforcement mechanisms yet to be introduced.

**b. Substantial clean-up efforts have been made but on an ad-hoc basis and at a high cost**

**In the last decade, China has made significant efforts to clean up contaminated former industrial sites.** Site remediation costs grew from less than RMB 1 billion in 2011 to at least RMB 4.5 billion in 2015. The key drivers for such efforts have been the unprecedented level of urbanization and the need to move industries away from populated centers, cases of serious environmental accidents, and increased public awareness of the harm to human health caused by soil pollution.

**At the same time, site remediation has focused on land redevelopment projects in areas with high land prices and has relied on an ad hoc approach.** Cleaning up polluted sites that are less attractive for redevelopment and abandoned wastelands which nonetheless pose health and environmental risks has lagged. Most remediation also relies on the fast but costly methodology of excavation of contaminated materials and off-site treatment or disposal. Alternative risk-based approaches that link land use to environmental characteristics in mixed land use sites are not widely applied. Phased approaches of site cleanup that link remediation to redevelopment needs, and that can be less costly, are also rarely explored.

**In addition, given China's unique land ownership structure and the large economic role of SOEs, pollution liability in some cases has not been clearly assigned.** Recent administrative measures oblige closing industries to carry out site investigation, risk assessment, and cleanup. However, the regulations do not cover land that is currently used and do not stipulate clearly that site investigations or risk assessments are required for potentially contaminated sites that are transferred to different users without change of land use purpose. This results in limited information on the size and extent of contaminated sites and reduces the attractiveness of private investment in potentially contaminated land.

**Finally, about 60 percent of the funding for contaminated site remediation in China has come from central government grants and 30 percent from municipal governments, while multi-source funding could be more efficient.** Soil remediation financing in areas with high land prices, where most clean-up projects have been so far, is not a constraint and could be supplied by site users or developers. Nevertheless, a large part has been funded by special government remediation grants and topped up with local government financing. Public funds could be better used to fill the gap between remediation cost and land redevelopment revenue in third- or fourth-tier cities, where land redevelopment potential is low and, in many cases, former industrial sites become abandoned wastelands (e.g., brownfields). Given the large scale of the soil remediation challenge, the current financing approach could undermine China's ability to achieve its medium- and long-term goals, including its 2020 target for safe use of 90 percent of its land.

Figure 26: Distribution of pollution sources by key industries...

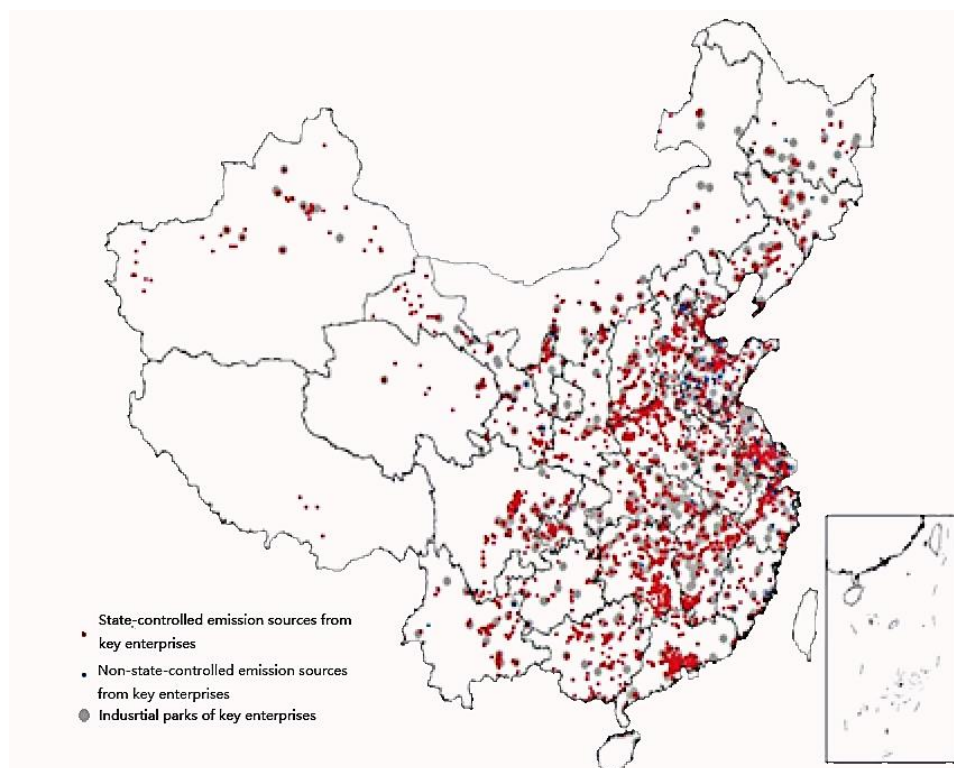
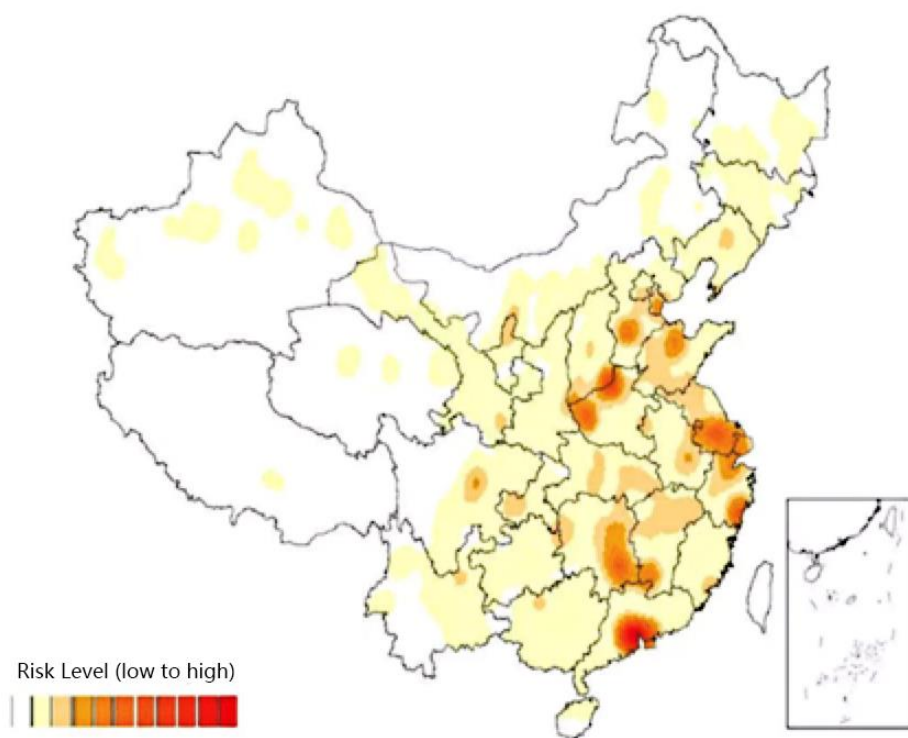


Figure 27: ... and risk levels



Source: Institute of Public and Environmental Affairs, 2016.

**c. A new, risk-based approach is essential in addressing costly soil remediation**

The successful implementation of the 2016 Action Plan would require government action in five priority areas, the first of which is the consistent application of a cost-benefit analysis (CBA) which also accounts for risks. While the CBA tools differ in various countries, they generally follow the same guiding principles. In the United States, the Environmental Protection Agency has issued a “Handbook on the Benefits, Costs, and Impacts of Land Cleanup and Reuse” which provides guidance for the development of methods for estimating costs and benefits of site remediation.<sup>27</sup> According to the handbook, the CBA should account for both market and nonmarket costs and benefits, such as social benefits from land cleanup, including improved human health and neighborhood conditions. The CBA can also assess potential trade-offs implied by different land uses. For example, commercial redevelopment might lead to higher business profits but fewer ecosystem benefits. Changes that cannot be monetized or even quantified are still important to include in the CBA as part of a qualitative assessment. Thus, a wider array of remediation technologies could be tailored to future land use. For instance, a partial clean-up to higher contamination thresholds can be implemented for less critical land uses such as industrial or commercial development.

The risk-based remediation approach used in a recent World Bank case study estimated cost savings of up to 80 percent and substantial increases in health and ecological benefits.<sup>28</sup> The analysis found that a developer who uses a smart, step-by-step remediation and redevelopment strategy, which takes into account contamination extent and future land use, would gain about three times more net monetized benefits (land value appreciation and reduction of risk of environmental emergency events) compared with a scenario in which the strictest standards are adopted without linking pollution levels to future land use. The study also showed that the non-monetized benefits (social, environmental, and economic)<sup>29</sup> of the risk-based approach are about nine times larger. The analysis estimated total cost savings of about 80 percent. The factors that contributed to lower costs include: area remediation and redevelopment in several phases; less strict remediation targets for areas with less sensitive proposed land uses; the applications of less expensive remedial technologies; and lower likelihood of secondary environmental impacts during remediation construction. Based on the assessment of national remediation costs by 2020, the study also calculated that the risk-based approach would allow the financing of up to eight times more sites compared to current practice.

Second, a better definition of standards and a stronger regulatory environment could ensure best-in-class cleanup standards and the prevention of future contamination. Solid national inventories, mapping contaminated sites and risk indications, have proven to be fundamental in policy development and site remediation management programs in other countries. While the 2014 MEP survey provided aggregate data on soil conditions, policies requiring systematic site investigations at the national, provincial and city levels of all potentially contaminated sites are still not in place. The lack of data makes it difficult to develop comprehensive contaminated land management plans, as well as assessments of financing needs. An inventory based on best practices should include both active and closed enterprises with elevated risks. The inventory can be staged, starting with historic and site-specific investigations, preliminary risk assessments (distinguishing between health and environmental impact), and investigations to determine required levels of control or cleanup.

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<sup>27</sup> <https://www.epa.gov/environmental-economics/handbook-benefits-costs-and-impacts-land-cleanup-and-reuse>

<sup>28</sup> World Bank, “Managing contaminated sites,” forthcoming.

<sup>29</sup> Social, environmental, and economic benefits include: (a) potential increase in the prices of goods and services in the area around the site, (b) decrease of production costs or rise in sales, (c) decrease in limitations for local residential activities, (d) improvement in work environment, (e) increase of ecological service value, (f) improvement in regional ecological safety, and (g) improvement in landscape and entertainment functions. Experts evaluate the scores using the case background information.



**Third, a clear delineation of liabilities shared between the public and private sector would reduce remediation costs.** Good international practice calls for the responsibility of soil pollution to be unambiguously placed with land owners and users, with corresponding actions required to investigate, monitor, and control contamination and protect the population and the environment. This obligation could be managed through operational licenses or environmental permit requirements for industrial facilities. Liabilities get transferred with the transfer of land using clean soil certificates, land use restrictions, and other forms of proof recorded in the national public registry. In addition, many countries distinguish between historic and recent pollution, with historic pollution subject to risk assessment and recent pollution requiring immediate clean-up. In China, where many former polluters were SOEs, the distinction between historic and current pollution would be important in firmly assigning liability to current land owners and users and indemnifying them from historic contamination.

**Fourth, including contaminated land management into the urban master-planning and spatial planning process would contribute to more optimal redevelopment.** The application of geographic information systems, planning models, and cost benefit analysis would ensure the flow of information between relevant authorities and assist in the risk-based assessment of remediation and redevelopment alternatives. In China, the environmental authorities are not routinely involved in the early decision stage of land planning. Therefore, an information sharing and cooperation mechanism between the land and urban planning, environmental, construction, and finance departments needs to be built.

**Finally, an innovative financing model could help deal with the significant expected cost of soil remediation in the future.** International experience has shown that addressing soil contamination requires massive amounts of funding. While the initial funding in most countries was public, there has been a gradual shift towards increased private financing. In Europe, the average public to private financing ratio has reached 1:1, with some countries, for example Belgium, attracting four times more private than public investment. China's soil remediation costs are estimated at trillions of renminbi in the next decades. Therefore, innovative financing mechanisms, with multi-source funding options and modalities, would need to be explored. These options include central and local governmental financing, PPPs, a polluter-pays principle, and developer or beneficiary compensation.

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