Cyclical Risks and Structural Imperatives

WORLD BANK GROUP

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List of Abbreviations

APPCAP	National Action Plan for Air Pollution Prevention and Control
AQM	Air Quality Management
BCAA	Bluetech Clean Air Alliance
BIS	Bank for International Settlements
CCDC	China Central Depository and Clearing
CDB	China Development Bank
CPI	Consumer Price Index
DRC	Development Research Center of the State Council
EMDE	Emerging Market and Developing Economy
EU	European Union
FDI	Foreign Direct Investment
FX	Foreign Exchange
GAINS	Greenhouse Gas - Air Pollution Interactions and Synergies model
GDP	Gross Domestic Product
GEP	Global Economic Prospects
GVC	Global Value Chain
HP	Hodrick-Prescott Filter
ILO	International Labour Organization
IMF	International Monetary Fund
IT	Information Technology
LPR	Loan Prime Rate
MEE	Ministry of Ecology and Environment
MLF	Medium-term Lending Facility
MOF	China Ministry of Finance
MRV	Monitoring, Reporting and Verification
MVF	Multivariate Filter
NBS	Chinese National Bureau of Statistics
OECD	Organisation for Economic Co-operation and Development
OPEC	Organization of Petroleum Exporting Countries
PBOC	People's Bank of China
PMI	Purchasing Managers' Index
PPP	Purchasing Power Parity
PWT	Penn World Table
Q1	First Quarter
Q2	Second Quarter
Q3	Third Quarter
Q4	Fourth Quarter
SHIBOR	Shanghai Interbank Offered Rate
SME	Small and Medium-sized Enterprise
SOE	State-Owned Enterprise
TFP	Total Factor Productivity
TiVA	Trade in Value Added
UMIC	Upper Middle-Income Countries
VAT	Value-added Tax
WDI	World Development Indicator
WHO	World Health Organization
WHO IT-2, WHO IT-3	Interim Targets set by the World Health Organization for 24-hour PM2.5
yoy	Year-on-Year
ytd	Year-to-Date

Executive Summary

China's economy is slowing, reflecting cyclical factors and longer-term structural trends. Notwithstanding the recent conclusion of the phase one agreement between China and the United States, short-term risks remain tilted to the downside amid a fragile global outlook and the lingering impact of trade tensions, especially on confidence. Adverse demographics, tepid productivity growth, and the legacies of excessive borrowing and environmental pollution will continue to weigh on growth over the medium term. If downside risks lead to a sharp reduction in growth, the authorities have policy space to act, but this needs to be done in a way that is consistent with reducing financial and corporate sector risks and achieving the desired rebalancing of the economy toward consumption and private investment. The key medium-term priorities are to deepen structural reforms to strengthen productivity growth and private investment, while accelerating rebalancing toward consumption, services, and green growth. This would require addressing market distortions and mainstreaming environmental sustainability into China's medium-term development strategy. Implementation of these priorities would boost China's long-term growth prospects; it would also help move toward a more comprehensive and lasting resolution of remaining deep-seated disagreements on global trade and investment, and public goods agenda.

Outlook: Cyclical headwinds and structural challenges. China's economy is slowing, reflecting both cyclical factors—the impact of the global economic slowdown, trade tensions, and tighter regulations of non-bank credit—as well as longer-term structural trends. Growth is projected to decelerate to 6.1 percent in 2019, and to further slow to 5.9 percent in 2020 and 5.8 percent in 2021 (Figure 1). This baseline projection reflects a recent de-escalation in trade tensions. As a result, the balance of risks has improved. The forecast also assumes that the somewhat improved external environment will reduce the need for policy support and enable the authorities to resume deleveraging. Nevertheless, short-term downside risks remain, including a sharp slowdown in global trade and investment in the event of a possible re-escalation of global trade tensions; a sharper-than-expected deceleration in major economies; and a renewed spike in global policy uncertainty, which may erode investor and consumer confidence. An upside risk to the forecast is the possibility of a comprehensive and sustained resolution of trade tensions between the United States and China, which could dispel enduring trade policy uncertainty, boost business confidence, and support China's trade, investment, and growth outlook. Domestically, growth may suffer from the potential adverse effects of financial de-risking, given its asymmetric impact on private sector financing and the risk of a disorderly unwinding of excessive leverage, which may excessively depress domestic demand.[1] Over the medium-term, adverse structural factors, including slower labor force growth, tepid productivity increases, and the lingering impact of excessive borrowing and environmental negligence will continue to weigh on potential growth, in the absence of deep and comprehensive reforms.

Short Term Policy Response: Balancing Act. Against the backdrop of remaining uncertainties, the authorities will need to continue to carefully balance policies to reduce cyclical risks to growth with further steps to deleverage the economy. This may require tolerating slower but safer growth in the short term. However, if growth weakens significantly, available fiscal space at the central level could be deployed to stabilize the economy, preferably in a way that would reinforce the desired shifts toward consumption, services, and private sector investment. Unless core inflation falls sharply, monetary easing would need to

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[1] De-risking refers to slowing the buildup of risks in the financial sector by reducing non-bank lending and other forms of regulatory tightening.

proceed cautiously to avoid reigniting excessive credit growth, thereby increasing financial and corporate sector vulnerabilities. Similarly, macro-prudential policies would need to continue to aim at de-risking, and not be used to ease liquidity conditions as part of a cyclical policy response.

Medium Term Challenges: Addressing Structural Headwinds and Overcoming the Legacies of Excessive Borrowing. Over the medium term, China would benefit from ambitious policy shifts aimed at stabilizing potential growth, accelerating economic rebalancing toward consumption and services, improving investment efficiency, and making growth more inclusive and environmentally sustainable (Part III and Special Feature). This includes steps to further reduce regulatory constraints and ease barriers to trade and investment, especially in services sectors. More efficient capital, land, and labor markets would enable the reallocation of resources toward more productive firms and sectors. Reforms of the "*hukou*" (household residency registration system) are crucial to facilitating greater labor mobility. In the financial system, continued efforts to deleverage need to be complemented by steps to address remaining distortions in financial intermediation, which continues to favor state-owned enterprises (SOEs) at the expense of the private sector, including widespread perceptions of implicit state guarantees. At the firm level, reforms would need to encourage the entry of new, efficient firms, and facilitate the restructuring and exit of less efficient ones. This could be accomplished through stronger competition policy frameworks and a leveling of the playing field for all market participants. Pension, education, health, and tax system reforms would help to address income inequality challenges, reduce incentives for excessive household savings, and contribute to human capital development. Progress in these areas would boost China's long-term growth prospects; it would also contribute to a more comprehensive and lasting resolution of remaining deep-seated disagreements on global trade and investment.

Mainstreaming Environmental Sustainability: Blue Skies Ahead. Achieving sustainable growth would also require mainstreaming environmental restoration into China's medium-term development strategy. This would not only ensure protection of China's vast natural assets and an improved quality of life but also unlock new drivers of innovation, growth, and job creation. China has achieved significant success in reducing pollution and improving air quality in its major cities, but challenges remain. To maintain progress toward bluer skies over the longer term, future priorities would need to include expanding access to new forms of air quality management financing for local governments and businesses. They would also need to focus on introducing cost-effective air quality management planning to ensure that public and private resources are used wisely, while solidifying the institutional and legal basis for greater use of market-based policy instruments.

Figure 1: The China economic update in charts

China's economy is slowing amid cooling domestic demand and external headwinds…

A. GDP growth
(Contribution to growth, percentage points)

Legend: Consumption | Investment | Net exports | GDP growth

(Categories: 2010-15, 2016-18, 2019Q1-Q3)
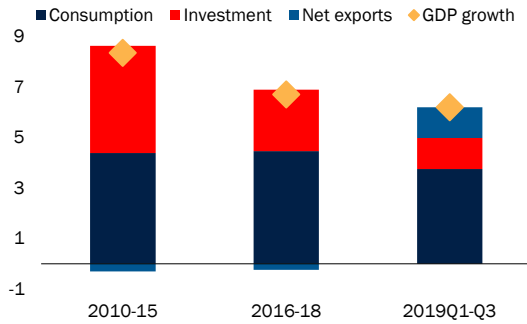
…with subdued manufacturing investment weighed down by uncertainty…

B. Fixed asset investment growth
(yoy ytd percent, in real terms)

(X-axis: Sep-13, Jan-14, May-14, Sep-14, Jan-15, May-15, Sep-15, Jan-16, May-16, Sep-16, Jan-17, May-17, Sep-17, Jan-18, May-18, Sep-18, Jan-19, May-19, Sep-19)

Legend: Manufacturing | Real estate | Infrastructure
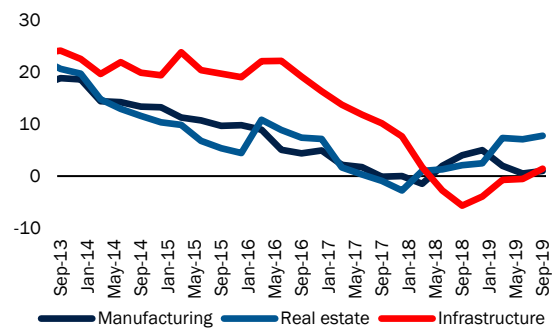
…credit growth has also slowed…

C. GDP growth and credit stock
(*Percent of GDP, percent***)**

Legend: Credit | GDP (RHS)

(X-axis: 2017Q2, 2017Q3, 2017Q4, 2018Q1, 2018Q2, 2018Q3, 2018Q4, 2019Q1, 2019Q2, 2019Q3)
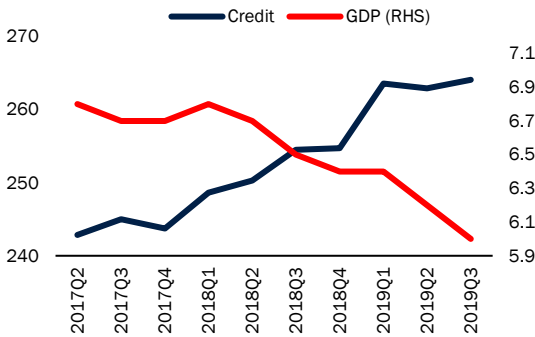
…to reduce risks from China's sizable and expanding debt stock

D. Total debt of the non-financial sector

(Y-axis: Total credit to the non-financial sector (% of GDP); X-axis: Per Capita GDP at constant 2010 US$, log scale)

Legend: China | India | Japan | Korea | United States
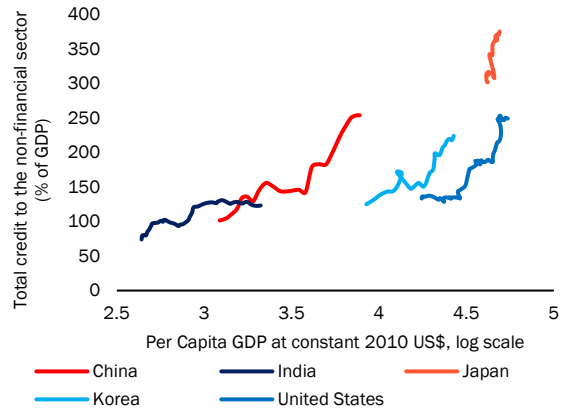
Aside from cyclical factors, China is also experiencing a structural deceleration…

E. Potential growth
(Percent)

Legend: 90 percent | 60 percent | 30 percent | Potential growth | Output growth

(X-axis: 2005 to 2020)
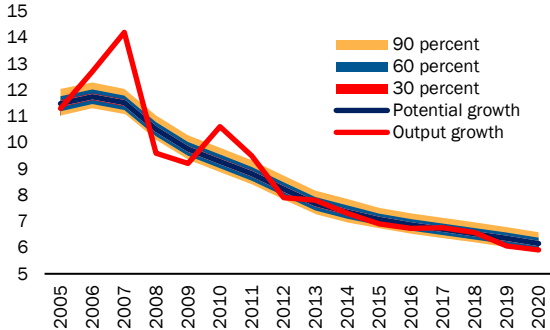
…with tepid productivity and labor force growth amid past overreliance on capital accumulation

F. Potential output growth decomposition
(Percentage points)

Legend: TFP | Physical capital | Human capital | Employment

Category	TFP	Physical capital	Human capital	Employment
1978-1987	4.2	2.3	0.7	2.9
1988-1997	3.6	2.8	0.8	2.8
1998-2007	3.2	5.5	0.5	0.8
2008-2017	1.1	6.3	0.5	0.3

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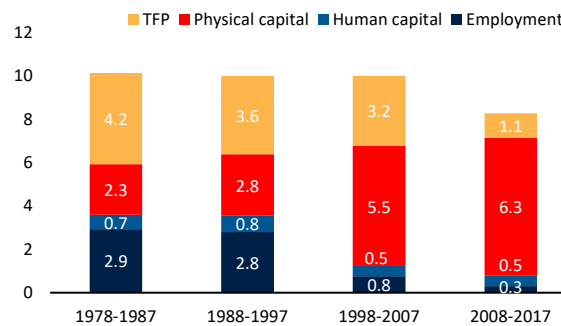
On the supply side, productivity growth has been lagging behind…

…increasing productivity will require deeper structural reforms

G. China's TFP relative to the global technology frontier

On the demand side, consumption has room to grow…

H. Ease of Doing Business, 2020
(Score 0-100 (higher = better))

…addressing income inequality would help

I. Household consumption per capita

J. Propensity to save by income decile
(Percent)
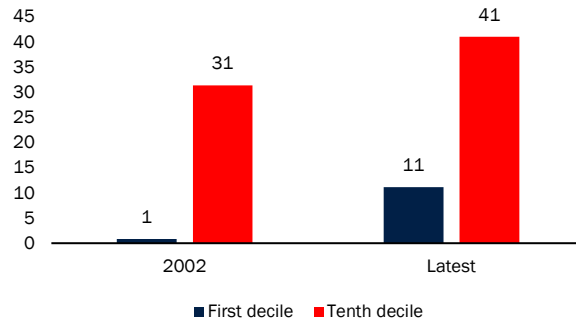
Despite progress, addressing environmental problems also remains essential for sustainable growth

K. The 2018 environmental performance index (EPI)
(Score 0-100 (higher = better))
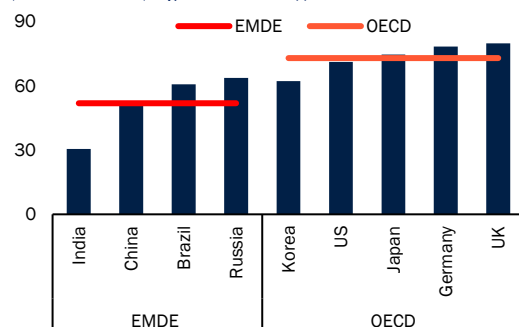
L. PM2.5 air pollution
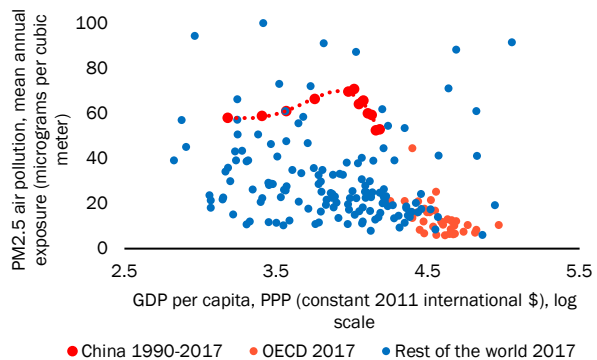
Source: Bank for International Settlements (BIS), Chinese National Bureau of Statistics (NBS), Haver Analytics, The 2018 Environmental Performance Index (EPI), PWT 9.1, Yale University, WDI, World Bank.
Notes: A. Investment refers to gross capital formation, which includes change in inventories. Last observation is 2019Q3. B. Fixed asset investment in urban areas. C. GDP growth in year-on-year percent change. *E.* Based on

estimates from a multivariate filter as in World Bank (2018a). Last observation is Q3 2019. F. G. Orange dots denote OECD countries. J. The latest year is 2012.

I. Cyclical Developments

Growth has Decelerated

Growth has decelerated amid cooling domestic demand and heightened trade policy uncertainty. GDP growth slowed to 6 percent in the third quarter, down from 6.3 percent in the first half of 2019 and 6.6 percent in 2018 (Figure 2). Growth in gross capital formation is estimated to have slowed to 2.8 percent, weighed down by a combination of tighter domestic financing conditions and weaker investor confidence, amid persistent trade policy uncertainty (Figure 3 and Figure 4). Consumption growth—while slowing from the exceptionally high levels of 2018—has remained resilient, supported by robust growth in real disposable income. While trade flows have weakened, reflecting higher tariffs and softening external demand, falling export growth has been more than offset by a sharp contraction in imports. As a result, net exports have strengthened, contributing about 1.2 percentage points to growth in the first three quarters of 2019 (Box 1).

Figure 2: GDP growth
(Contribution to growth, percentage points)
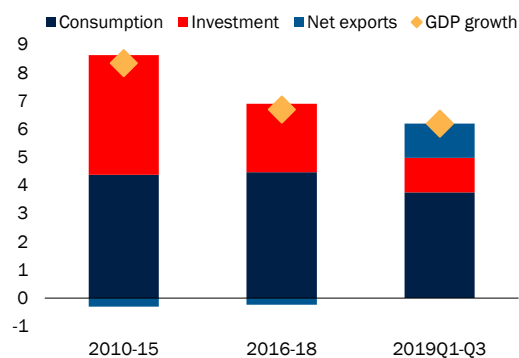
Source: National Bureau of Statistics (NBS), World Bank.

Figure 3: Non-bank lending
(Share in percent; yoy percent)
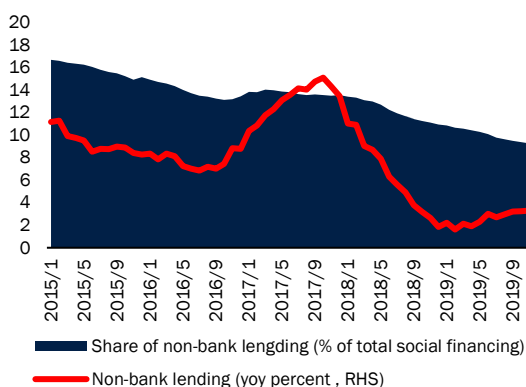
Source: PBOC, World Bank.
Note: Non-bank lending includes entrusted loans, trust loans, and banker's acceptances.

Figure 4: Trade policy uncertainty and business confidence[2]
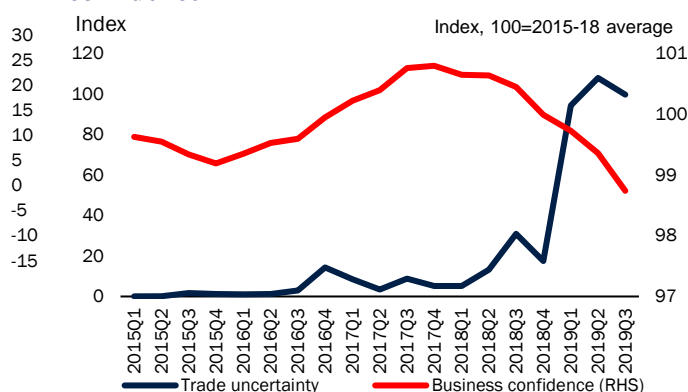
Source: Ahir, Bloom, and Furceri (2018); Organisation for Economic Co-operation and Development; World Bank.

High-frequency indicators have been mixed so far in 2019Q4 but are showing some incipient signs of stabilization. Fixed asset investment growth fell to a low of 5.2 percent yoy in November and remained unchanged in December. However, both the Caixin and the official manufacturing PMIs printed above the

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[2] Trade policy-related uncertainty is an index presented in Ahir, Bloom, and Furceri (2018) for 143 countries on a quarterly basis. Business confidence data are end-of-period and include data through September 2019. Aggregate business confidence is calculated using constant 2010 U.S. dollar GDP weights at 2010 prices and exchange rates. Last observation is 2019Q3.

50 threshold in November, after sharply diverging in prior months. Industrial production growth accelerated to 6.2 in November led by a rebound in manufacturing activity. A rebound in commercial vehicle sales has helped ease the contraction in overall vehicles sales. Trade activity has continued to improve. In particular, imports grew by 0.3 percent yoy in November, marking the first yoy growth since April. However, export contraction deepened to 1.1 percent yoy led by falling shipments to the United States. Trade policy uncertainty has declined amid a notable de-escalation of trade tensions between China and the United States, but the impact of trade tensions on confidence still lingers.

Box 1: Global economic developments

Global growth is expected to decline to 2.4 percent in 2019 (Figure 5). Global economic activity likely slowed further in 2019Q3. However, the global manufacturing PMI for November suggests that global manufacturing may have begun to stabilize (Figure 6). In addition, an apparent improvement in investor sentiment, underpinned by a recent de-escalation of trade tensions between China and the United States—including the conclusion of a partial trade deal in mid-December and continued global monetary policy easing—point to the possible bottoming out of the current global slowdown.

Figure 5: Global economic growth rates, 2010-19
(Percent)
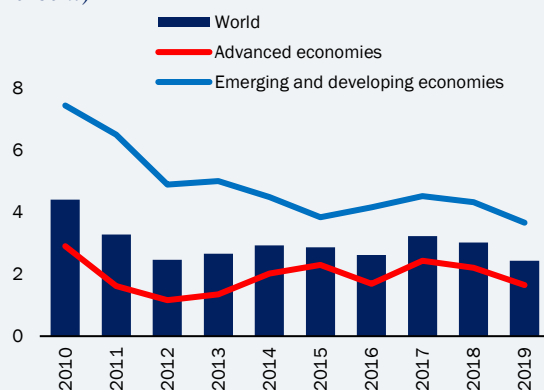
Source: Haver Analytics, World Bank.

Figure 6: Global manufacturing activity, 2018-19
(Index, 50+ = expansion, 3-month moving average)

Source: Haver Analytics, World Bank.

Growth slowed in major economies. The U.S. economy expanded 2.1 percent in 2019Q3 (quarter-on-quarter seasonally adjusted annual rate (q/q saar)). The primary driver of growth continued to be private consumption, supported by a healthy labor market. In the Euro Area, third quarter activity remained subdued. Germany avoided a technical recession by growing 0.3 percent (q/q saar). In the United Kingdom, the general election on December 12 resulted in a Conservative Party victory, which will likely be followed by a ratification of the revised Brexit agreement by the Jan. 31, 2020, deadline. In Japan, the government has announced a major new stimulus package worth 1.9 percent of GDP over 15 months in response to the slowdown of activity in 2019Q4, and also to mitigate the impact of Typhoon Hagibis, which hit Japan in October 2019.

Growth has been sluggish in emerging market and developing economies (EMDEs). EMDEs continue to experience broad-based weakness in industrial production and exports in the second half of the year. All major EMDEs are moderating or slowly rebounding from a sharp deceleration in activity over the past few quarters. In India, growth has softened, reflecting a widespread slowdown in domestic demand amid tight credit conditions. Growth is recovering, but activity remains weak in a number of large commodity exporters, including Brazil, Russia, and South Africa.

Global trade continues to show broad-based weakness, but trade policy uncertainty has declined

amid a notable de-escalation of trade tensions between China and the United States. Growth in global goods and services trade slowed sharply from 4 percent in 2018 to an estimated 1.4 percent in 2019—the weakest pace since the global financial crisis. While global new export order PMIs staged a modest recovery at the beginning of 2019Q4, the index ticked down in November and has remained in contraction for over one year. Nevertheless, a phase one agreement reached between China and the United States in December has led to a notable de-escalation of trade tensions. The agreement included a partial rollback of a subset of U.S. tariffs on Chinese exports to the United States, as well as Chinese commitments to buy more U.S. agricultural products, strengthen intellectual property protection, and pursue financial services liberalization.,

Global financial conditions have been stable but fragile. The Federal Reserve lowered its policy rate by another 25 basis points in October; markets now expect rates to remain at their current level until the end of 2020. Central banks in a number of EMDEs have also been adding stimulus, while the European Central Bank's purchases of €20 billion worth of bonds per month has begun. Global equity valuations have benefited from monetary stimulus, diminished prospects of a disorderly Brexit, and a de-escalation of global trade tensions. U.S. stock markets have reached record highs, while those in China have regained much of the value lost since peaking earlier in the year. Meanwhile, rising yields have reduced the stock of negative-yielding debt from its August high of $17 trillion to below $12 trillion by late-2019Q4, reflecting rising investor optimism about the global economy. Foreign investors continue to accumulate EMDE debt while divesting from EMDE equities. As a result, EMDE equity markets have been generally flat in November, while spreads on EMDE debt have continued to shrink, reaching their lowest levels since the first quarter of 2018.

The prices of most commodities fell in 2019, mainly reflecting the deterioration in the growth outlook (Figure 7). Oil prices averaged $60 per barrel in 2019, a 12 percent fall from 2018. Prices were supported by production cuts by OPEC and its partners. However, these pressures were offset by weakening oil demand, as exemplified by downward revisions to demand projections. Prices for most base metals weakened in the second half of 2019, primarily reflecting weaker global growth and elevated trade tensions. Agricultural prices declined in the second half of 2019 on improved weather conditions, as well as elevated stock levels for grains.

Figure 7: Commodity price indices
(Index, nominal term, 2010=100)
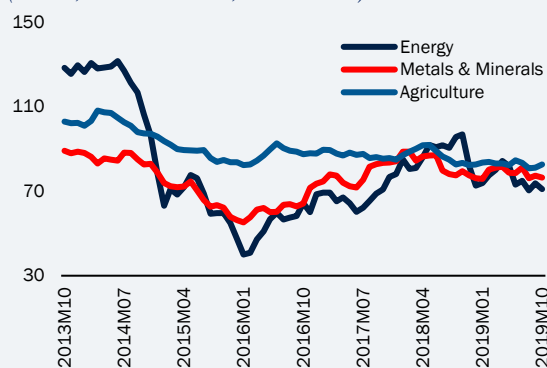
Source: Haver Analytics, World Bank.

Consumption moderated somewhat but has remained the primary driver of economic activity amid weaker investment and exports. Consumption growth softened from 9.8 percent in 2018 to a still robust 6.8 percent in the first three quarters of 2019. Its contribution to growth declined to 3.8 pp yoy in the first three quarters of 2019, down from 5.2 percentage points yoy during the same period last year. This partly reflected a normalization from the exceptionally high spending on health care in 2018, partly in response to the relaxation of some price controls on essential medicines, and weaker auto sales due to stricter emission standards and the withdrawal of electric vehicle subsidies. A rapidly rising household debt service burden has also weighed on consumer spending. Wage growth has moderated due to slower GDP growth and the apparent decline of jobs in the industrial and manufacturing sectors. In addition, policy uncertainty has been weighing on consumption expenditure growth, prompting households to save a growing share of their income (Part III).

Investment has decelerated, reflecting a sharp decline in the export-oriented manufacturing sector. Fixed asset investment in the manufacturing sector has decelerated precipitously, reflecting deteriorating business confidence amid trade tensions and higher bilateral tariffs between China and the United States. In addition, a sharp destocking in the sector weighed on capital formation in the manufacturing sector. By contrast, investment in real estate has been strong, partly reflecting shanty town reconstruction. After a sharp contraction, infrastructure investment rebounded somewhat, due in part to additional fiscal stimulus adopted in early 2019 (Figure 8). Investment spending by state-owned companies picked up, while investment by the private sector has moderated (Figure 9). Overall, gross capital formation contributed only 1.2 percentage points yoy to growth in the first three quarters of 2019, compared to 2.5 percentage points during the same period in 2018.

Figure 8: Real fixed asset investment growth by sector
(yoy ytd percent, in real terms)
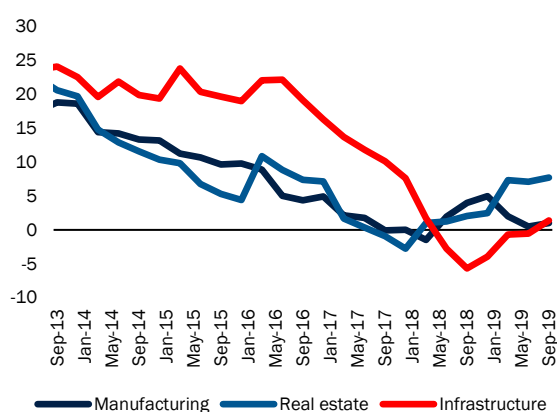
Source: NBS, World Bank.
Note: Fixed asset investment in urban areas.

Figure 9: Real fixed asset investment growth by ownership
(yoy ytd percent, in real terms)
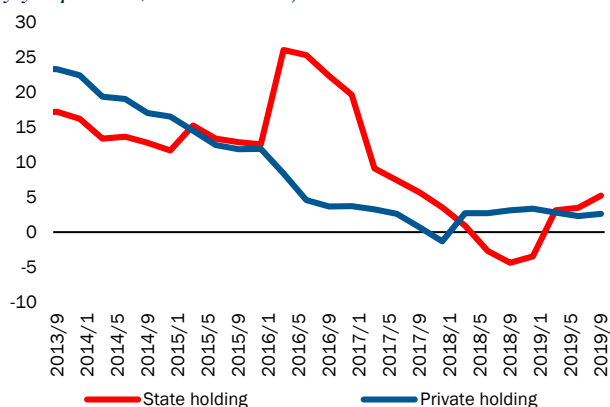
Source: NBS, World Bank.
Note: A notable break in the trend of FAI spending by ownership type occurred in 2016, and could be due to a change in firm ownership.

Industrial production growth has reached a multi-year low. This mirrored a weakness in the manufacturing sector, which has been only partly offset by robust growth in mining and construction. The deceleration in manufacturing value added by industries (VAI) growth has been broad-based. Factors that impacted a sharp slowdown in the production of automobiles, computers, and other electronic equipment included trade tensions, weak global demand, tighter emission standards, continued targeted cuts in some overcapacity sectors, as well as the inventory destocking accumulated in expectation of higher tariffs. By contrast, mining production has rebounded, possibly a result of new restrictions for coal imports due to environmental concerns, and growing profits triggered by earlier cuts in overcapacity. Stronger construction growth has been consistent with robust real estate and infrastructure investment.

Growth in services moderated somewhat but has remained resilient. Buoyant infrastructure and real estate investment stemmed from increased growth in recent quarters in the construction, transportation, and real estate sectors. Meanwhile, the rapid digitization of the Chinese economy continued to fuel double-digit growth in the software and IT sectors, contributing 0.8 percentage point to growth in the first three quarters of 2019. By contrast, the contribution of financial intermediation has weakened, a result of ongoing de-risking efforts in the financial system.

Growth in agricultural production has decelerated. Pork production declined steeply, following an African swine fever outbreak. China's pig herd shrank by 17.3 percent in the first three quarters of 2019. By contrast, sheep, beef, and poultry meat production picked up by 2.3, 3.2, and 10.2 percent, respectively,

during the same period. Meanwhile, VAI growth in crop farming, supported by grain and rice production, remained robust at 4.3 percent yoy in the first three quarters of 2019.

Rebalancing from industry to services continued gradually. The services share of GDP rose 0.7 percent in the first three quarters of 2019, hitting 54 percent, while industry's share of GDP shrank by 0.7, to 39.8 percent. In real terms, the shift from industry to services is more gradual, because prices for services have grown faster than the price of goods (Figure 10). China's share of services in GDP is on par with upper middle-income countries, but still much lower than that of high-income countries (Figure 11).

Figure 10: GDP by sector, 1991-2018
(Share in percent, 2018 constant prices)
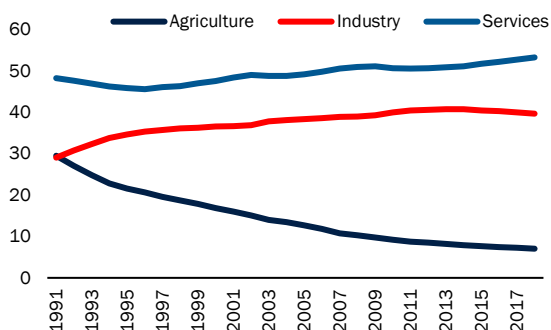
Source: NBS, World Bank.

Figure 11: Services share in GDP in 2018
(Percent)
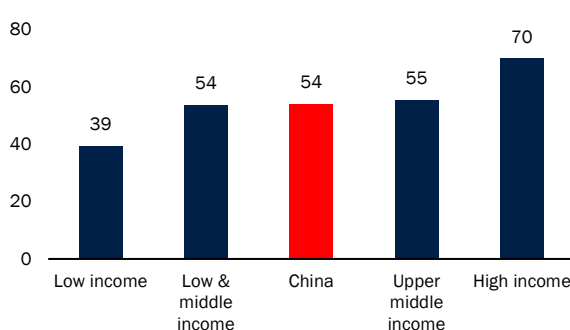
Source: NBS, WDI, World Bank.

Trade Flows have Slowed

Trade flows slowed amid policy uncertainty and weak global demand. Goods export growth has weakened substantially. The U.S. dollar value of China's goods exports contracted by 0.3 percent yoy in the first 11 months of 2019, in contrast to a 9.9 percent expansion in 2018. The contraction in exports to the United States has gradually deepened as higher tariffs on Chinese exports gradually came into effect. Goods exports included in the list of products now subject to a 25 percent tariff (around $250 billion in goods) dropped in the early part of 2019. The list of products subject to a 15 percent tariff (around $112 billion in goods) has also slowed sharply since Sept. 1, 2019, when the tariff increase took effect (Figure 12 and Figure 13). Shipments to the rest of the world, especially to Asia, have also declined sharply, reflecting subdued demand in partner countries, disruptions associated with higher prices for parts and components for final goods exports, as well as some cyclical factors (Figure 15).

Figure 12: Tariff announcements by China and the United States
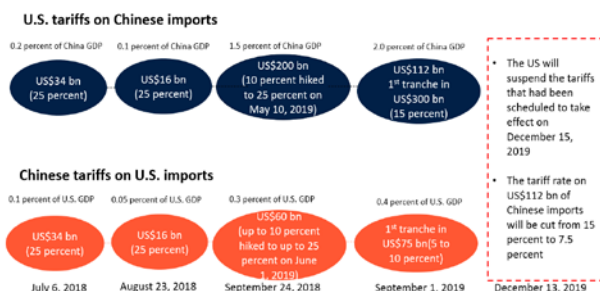
Figure 13: China's goods exports to the United States by product list subject to higher tariffs
(yoy percent)
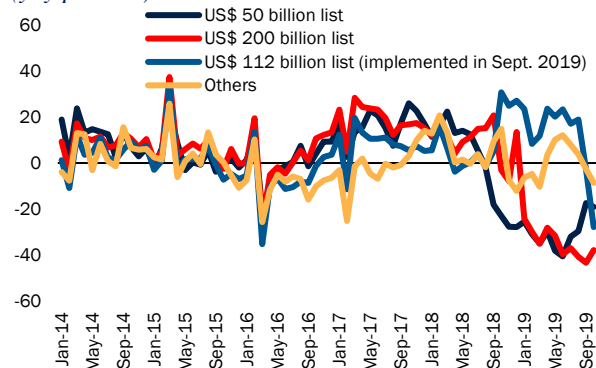
Source: China MOF, The United States Trade Representative (USTR), World Bank.

Source: US Bureau of Economic Analysis, World Bank.

Figure 14: Growth in goods trade
(yoy percent, 12 month moving average)
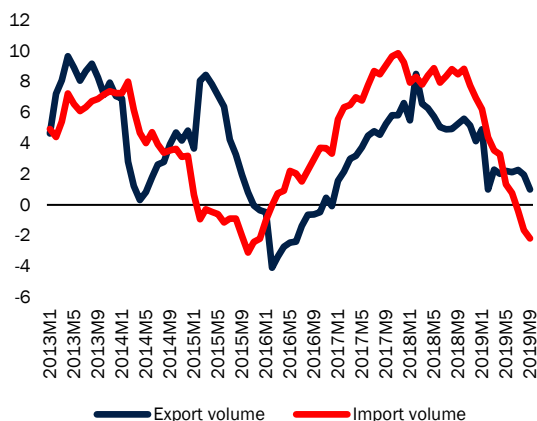
Source: China Customs, NBS, Haver Analytics, World Bank.

The slowdown in goods import growth was even sharper, with a 4.5 percent yoy contraction in the first eleven months of this year compared to an almost 16 percent increase in 2018. Imports, especially of intermediate goods, declined substantially, signaling a deceleration in domestic demand, inventory adjustment over the business cycle, and the possibility of import substitution, in addition to the impact of higher tariffs on goods imports from the United States. Imports of raw materials also dropped sharply due to weaker demand, tighter environmental standards, and the destocking process over the business cycle (Box 2).

The current account surplus has widened. The current account surplus was driven primarily by the goods trade surplus, which increased to 2.4 percent of GDP in the first three quarters of 2019, up from 1.9 percent for the same period last year. A smaller service trade deficit, driven by China's lower spending on outbound travel and intellectual property royalties, also contributed to the higher current account surplus.

Figure 15: Growth in good exports, by regions
(yoy percent, 12 month moving average, in USD terms)
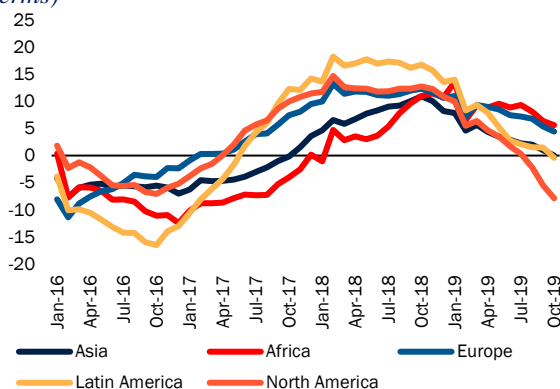
Source: China Customs, NBS, World Bank.

Figure 16: Growth in good imports, by regions
(yoy percent, 12 month moving average, in USD terms)
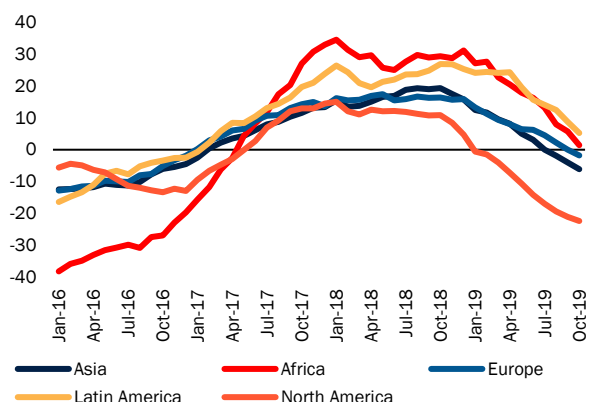
Source: China Customs, NBS, World Bank.

Box 2: Drivers of China's import contraction

China has experienced a broad-based import contraction in 2019. The wide-ranging import decline was led by a sharp contraction of U.S. imports. The U.S. dollar value of China's goods imports from Asia and Europe contracted by 6.4 and 2.8 percent, respectively, in the first ten months of 2019, down sharply from strong growth of 20.1 and 19.1 percent during the same period last year (Figure 16). The decline in both import volumes, as well as a weakening of prices, contributed to the deceleration. After nearly double-digit growth in 2017 and 2018, import volumes contracted by about two percent yoy in the first nine months of 2019 (Figure 14).

Imports of both commodity and non-commodity goods sharply declined in 2019 (Figure 17). Commodity imports, which account for about one-third of total imports, contributed to about 25 percent of the import decline in 2019. Among non-commodity imports, the slowdown has been pronounced in computer, electrical equipment, and machinery sectors, which account for about 40 percent of the drop in imports this year (Figure 18).

Import contraction was mainly driven by a downturn in imports of intermediate goods. Imports of both intermediate and capital goods declined sharply in 2019 (Figure 19). However, intermediate goods, which account for a higher share in total imports, explain about two thirds of the fall of imports this year (Figure 20). According to the OECD Trade in Value Added (TiVA) database, intermediate products accounted for almost three-fourths of China's imports of computer and electrical equipment in 2018. Investment has the highest import content among the demand components in China (Kang and Liao 2016). A slowdown in manufacturing investment, especially the machinery and transport equipment sectors, led to a decline in imports of investment goods. Imports of consumer goods have been more resilient, and generally still account for a small share of total imports.

The sharp fall in imports of intermediate goods has been driven by several cyclical factors, including through backward supply chain linkages of China's export sector. First, intermediate goods such as computer, electrical equipment, and machinery are the primary goods targeted by U.S. tariffs. Import demand has declined in anticipation of a future slowdown of exports in these sectors (Figure 21). Second, business sentiment weakened, due in part to the ongoing trade tensions but also because of anemic global demand. Investment weakened in those sectors along with the inventory destocking process, leading to softer import demand (Figure 22). Third, the process of substitution of imported intermediate inputs with domestic production has accelerated, particularly within the high-tech sectors. This acceleration was driven partly by trade tensions, which have been an additional drag on import growth this year. Other than North America, China's import demand from Asia dropped the most among all regions in 2019, due to a contraction of imports of intermediate goods used in China's supply chains, amid complex backward linkages with the Asian economies.

Figure 17: Import growth of commodity and non-commodity goods
(yoy, ytd percent)

Figure 18: Import growth of non-commodity goods, by sector
(yoy ytd percent; Jan-Oct., 2019 v.s. Jan-Oct., 2018)
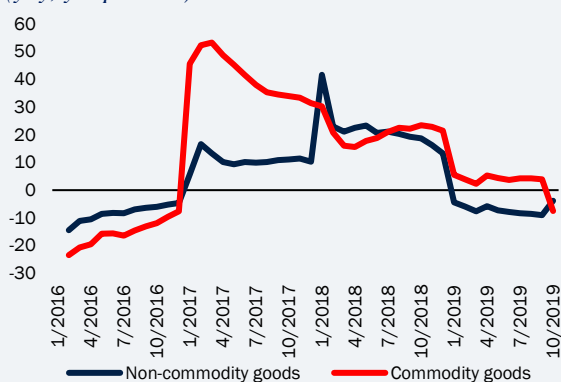
Figure 19: Import growth of intermediate, capital and consumption goods
(yoy, ytd percent)
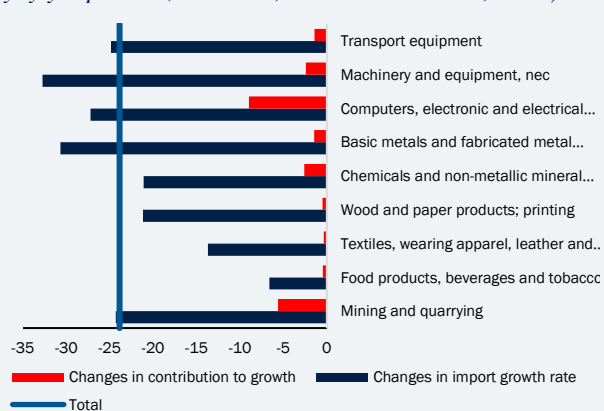
Figure 20: Import growth of non-commodity goods by types of goods
(yoy ytd percent; Jan.-Oct., 2019 vs. Jan.-Oct., 2018)

Figure 21: Import growth and import intensity, by industry
(yoy ytd percent; percent)

Figure 22: Growth in inventory stock of industrial enterprises
(yoy percent)

Source: China Customs, OECD, World Bank.
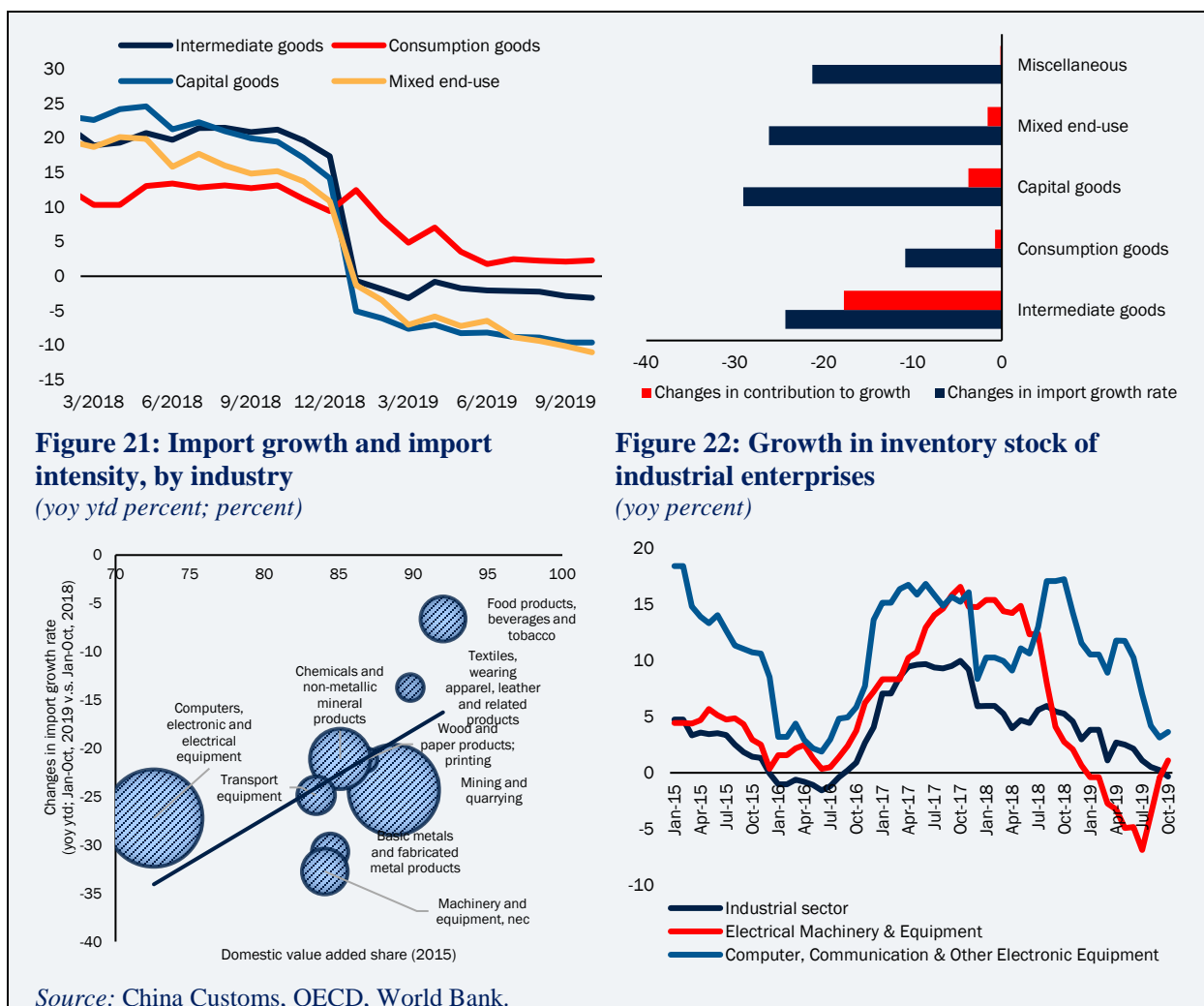
Trade policy uncertainty contributed to financial market volatility and exchange rate pressures during most of 2019. At the start of 2019, China's financial markets had recovered most of the heavy losses incurred in 2018, but volatility returned in May with the escalation in China-U.S. trade tensions. The Shanghai Composite Index lost about 5 percent between early May and early December (Figure 23). The Renminbi depreciated by more than 4 percent against the dollar and also against the basket of 24 trade-weighted currencies selected by the China Foreign Exchange Trading System (CFETS) during the same period, and breached the RMB 7 per dollar threshold for the first time since 2008 (Figure 24). Financial market pressure has eased in 2019Q4, following progress in bilateral negotiations between China and the United States, culminating in the phase one trade agreement.

Net capital outflows have increased amid trade policy uncertainty. Net capital outflows (including errors and omissions) have increased to $156 billion (1.1 percent of GDP) in the first three quarters of 2019, up from $30 billion in 2018. However, the magnitude of net capital outflows remained considerably lower than in 2015-2016. It is likely that new capital controls imposed since late 2016 may be playing a role. In addition, China's opening up policies have attracted foreign capital inflows. Foreign direct investment (FDI) grew by 2.3 percent yoy in the first 10 months of 2019. This marked the reversal of a declining trend in 2013-2017. The composition of FDI has shifted, reflecting a decline of flows from the United States and increased investment from the Republic of Korea and Singapore. Foreign equity inflows through the Shanghai/Shenzhen Stock Connect soared to a monthly average of $3.7 billion in the first eleven months

of 2019, up from $0.5 billion in 2015-2016, while purchases of Chinese bonds by foreigners rose from an average of $1.2 billion to $7.4 billion during this period. Increased net capital outflows have contributed to a modest decline of China's foreign exchange (FX) reserves this year. Nonetheless, China's external position remains strong, with FX reserves of $3.11 trillion (equivalent of around 17 months of imports by the end of November).

Figure 23: Shanghai composite index
(December 19, 1990=100)
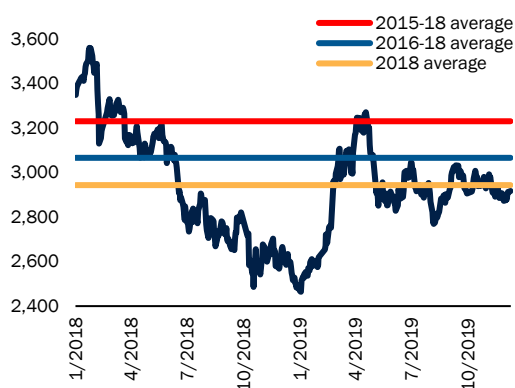
Source: Shanghai Stock Exchange.

Figure 24: Spot and currency basket exchange rates
(Renminbi per dollar; Index December 31, 2016 = 100)
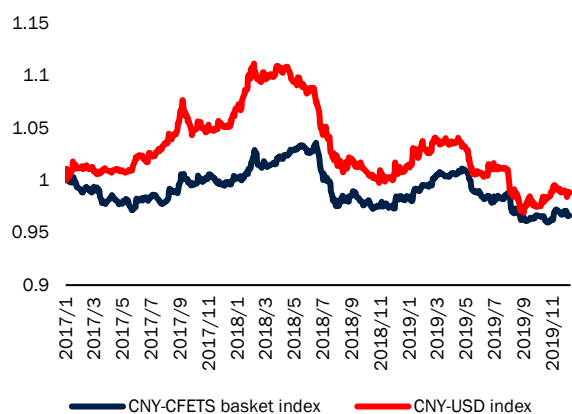
Source: State Administration of Foreign Exchange (SAFE), World Bank.

Consumer and Producer Prices have Diverged

Core inflation edged down, but strong food price growth contributed to higher headline inflation. While still slightly below the government's 3 percent target for 2019, CPI inflation accelerated to an average of 2.8 percent in the first eleven months of 2019. Higher food price growth was driven mostly by a supply shortfall caused by an outbreak of African swine fever. Pork prices rose by 37.3 percent in the first ten months of 2019, contributing around 0.9 percentage point to headline CPI. Prices of beef, lamb, and chicken rose by about 6-12 percent, resulting in about a cumulative 0.2 percentage point contribution to headline CPI this year. Core inflation, excluding food and energy prices, moderated to an average of 1.5 percent yoy in June-November 2019, from 1.8 percent in the first five months of 2019, pointing to a cooling of domestic demand amid weaker wage growth (Figure 25).

Housing price appreciation has slowed since June 2019, but the trends differ across cities. Home prices of the newly constructed residential buildings in tier-2 and tier-3 cities slowed to an average of 7.5 percent yoy in October from 11.2 percent yoy in June (Figure 26). This was driven by higher housing inventories, slower housing sale growth, and fading subsidies for shantytown redevelopment projects. By contrast, housing price growth in tier-1 cities registered a mild recovery in the second half of 2019, amid a continued fall of land supply.

Producer price inflation (PPI) has decelerated sharply since June 2019, mirroring weaker price growth of commodities and manufacturing goods. PPI declined to an average of -0.9 percent in June-November 2019, from 0.4 percent in the first five months of 2019. The return to PPI deflation was led by lower producer prices of raw materials, which contracted by an average of 4 percent in June-November 2019. During this period, PPI inflation for producer goods also turned negative, at an average -1.6 percent, pointing to subdued manufacturing activity. Sluggish producer prices have negatively affected industrial profits, which declined by 2.1 percent in the first ten month of 2019, down from a 10.3 percent expansion

last year. Profits of industrial SOEs, which dominate the raw materials sector, declined sharply by 12 percent yoy in the first 10 months of 2019. Profits of industrial private firms also moderated to 1.5 percent yoy during this period.

Figure 25: Monthly change in consumer prices
(yoy percent)
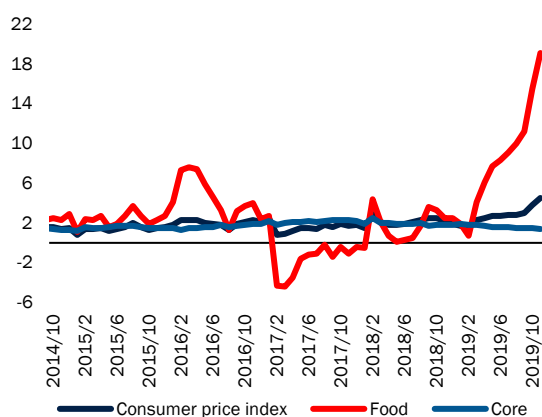
Source: NBS, World Bank.

Figure 26: Housing price growth in 70 cities
(yoy percent)
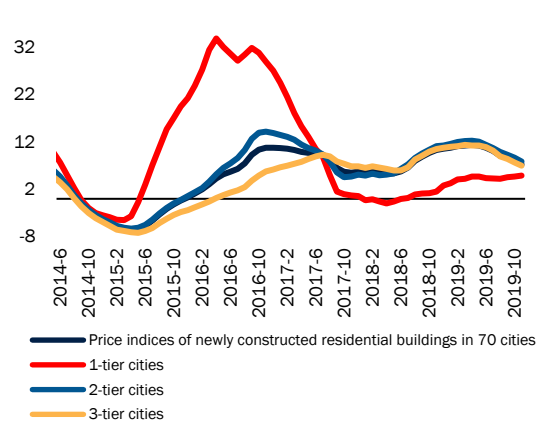
Source: NBS, World Bank

Growth in real household incomes in both urban and rural areas slowed but remained robust, supporting poverty reduction. In the first three quarters of 2019, average real household disposable income per capita grew by 6.1 percent, down from 6.6 percent during the same period last year. Growth was faster in rural areas (6.4 percent) than urban areas (5.4 percent), indicating a narrowing of the urban-rural gap. At the same time, job creation remained steady, with 11 million new jobs created in the first three quarters of 2019, unchanged from the same period a year earlier. Nevertheless, the pace of layoffs in the industrial sector has accelerated, and the official unemployment rate continued to worsen. World Bank estimates suggest that the proportion of the population consuming less than $1.9 per day in 2011 purchasing power parity (PPP) fell from 0.6 percent in 2016 to 0.3 percent in 2019. While a large number of people have been lifted out of absolute poverty, many remain vulnerable. Those living on less than $5.5/day still constituted 24.7 percent of the population in 2016, although the rate is expected to decline to 16 percent in 2019.

Figure 27: China's Gini coefficient, 2003-2018
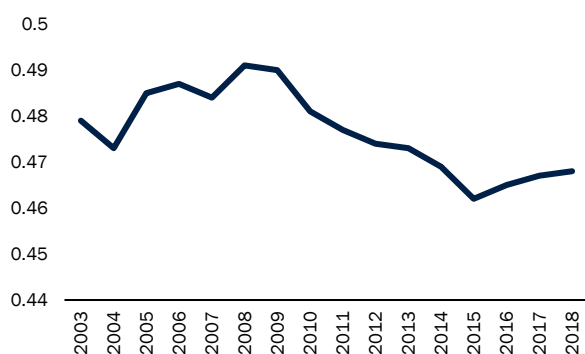
Source: NBS, World Bank.
Note: Gini coefficient is based on household income distribution.

Figure 28: The disparities of GDP per capita
(Ratio of eastern coastal regions to other regions)
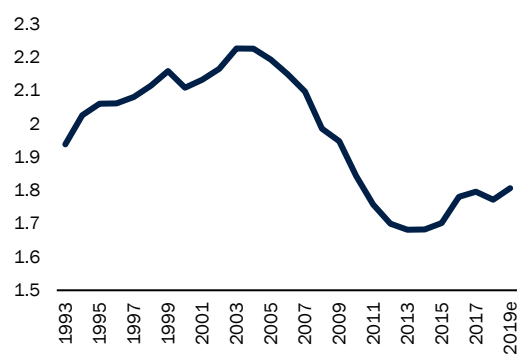
Source: NBS, CEIC, World Bank.
Note: 2019 value is estimated based on data from the first three quarters.

Despite progress in reducing poverty, relatively high-income inequality persists. The Gini coefficient, a measure of overall income inequality, declined to 0.462 in 2015, and has since risen to 0.467 in 2018 (Figure 27). Higher income inequality is partly driven by unequal regional income distribution. The eastern coastal regions have been the driver of China's rapid growth, due to its geographic location and the early introduction of reforms. As a result, the eastern coastal region is now home to 38 percent of the population, and its per capita GDP was 77 percent higher than that of the central, western, and northeastern regions in 2018. This gap widened further in the first three quarters of 2019. This is in part due to a disproportionate slowdown in interior provinces, which are more dependent on commodities and heavy industry. The slowdown has been negatively affected by structural shifts, especially necessary cuts in overcapacity (Figure 28).

The Pace of Debt Buildup has Moderated

With tighter financing conditions, growth in credit to the non-financial sector moderated to an average of 11.1 percent yoy in July-October, compared to 12.2 percent during the same period last year.[3] Despite slower credit growth, China's aggregate debt-to-GDP ratio inched up slightly in 2019 to an estimated 260 percent, due to lower nominal GDP growth (Figure 29 and Figure 30). Moreover, the legacies of excessive borrowing are significant and continue to weigh on growth and investment. The increase in the debt ratio over the five years leading up to 2013 was the second largest in EMDE history (Figure 31; Kose et al. 2019).

Bank loan growth softened, reflecting lower demand for credit amid higher uncertainty, while non-bank lending (shadow banking) continued to contract due to regulatory tightening. As a result, shadow banking assets continued to decline to RMB 59.6 trillion, or 64 percent of GDP in the first half of 2019, down from the 87 percent peak reached at the end of 2016.[4] The contraction was driven by a decline in asset management products, while lending to local government financing vehicles (LGFVs) rebounded in the second quarter of 2019, reflecting a pickup in subnational infrastructure investment. An unintended side effect of the clampdown on shadow banking, however, is a disproportionate impact on private sector financing, especially on small and medium enterprises. Such enterprises suffer from more limited access to the formal banking sector credit, and therefore rely more heavily on shadow banking.

Figure 29: GDP growth and total credit stock to GDP
(Percent of GDP, percent)

Source: Haver Analytics, World Bank.
Note: GDP growth in year-on-year percent change.

Figure 30: Total debt of the non-financial sector
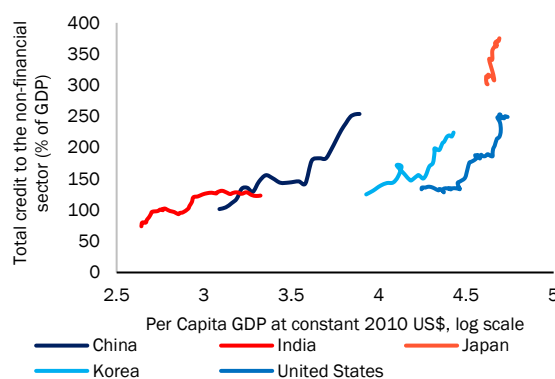
Source: BIS, World Bank.

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[3] Total credit = total social financing – equity financing + government bonds – local government special bonds, using the revised definition of TSF, which includes special government bonds, asset-backed securities held by banks, and loan write-offs.
[4] See Moody's, Quarterly China Shadow Banking Monitor, September 2019.

Figure 31: Selected economies: Peak five-year change in total debt

(Percentage points of GDP)

Figure 32: Household debt

(Percentage points of GDP)
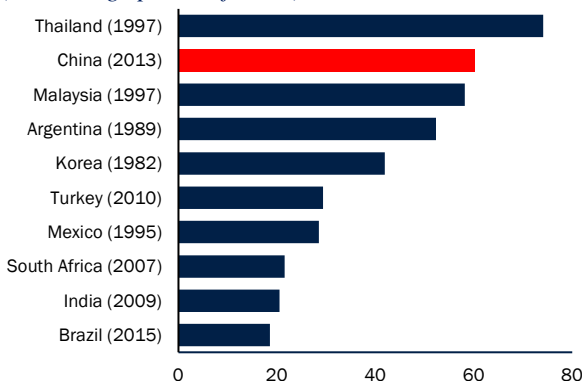
Source: BIS, World Bank.

Note: Largest change in credit to the private sector in percentage point of GDP over any 5-year interval. Data as of December 2019.
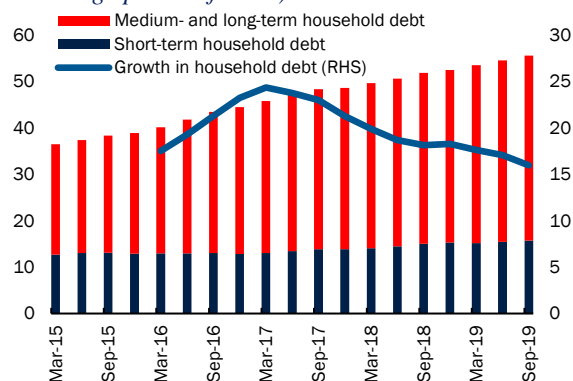
Source: PBOC, World Bank

The composition of non-financial debt continues to shift with rapidly expanding household debt. While growth in household loans moderated to 16 percent yoy in the first three quarters of 2019, household leverage continues to rise, reaching 55.6 percent of GDP in September 2019 (Figure 32). While explicit government debt rose on higher special bond issuances this year, implicit sovereign liabilities associated with local governments and state-owned enterprises (SOEs) declined. This reflects the authorities' commitment to harden the budget constraints for local government, restrict off-budget borrowing, and increase their responsibility for debt management. Meanwhile, monetary and regulatory tightening since late 2016, together with subdued corporate investment activity, have contributed to lower corporate debt growth this year. China's external debt is rising, as firms turn to foreign borrowing amid tightening domestic borrowing conditions. However, China's total external debt, including the debt of Chinese subsidiaries operating aboard, remained small, at less than 20 percent of GDP by the second half of 2019.[5]

While the banking sector remains stable, some smaller banks have experienced difficulties. Several municipal commercial banks have experienced financial distress due to their aggressive lending prior to 2017. So far, these problems have been confined to several local banks, and have been dealt with on a case-by-case basis, relying mostly on official financial support to manage failing financial institutions. Reflecting heightened risk aversion, risk premia for wholesale funding for small and higher risk banks rose sharply in the interbank market in June and July (Figure 33). While market conditions improved after the authorities began injecting liquidity in the interbank market, these episodes indicate that financing conditions for some segments of the banking sector remain sensitive and could spread instability in the event of further liquidity or solvency problems at individual banks.

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[5] The official external debt data provided by the State Administration of Foreign Exchange (SAFE) is based on residency, and therefore would not include the debt of Chinese subsidiaries operating abroad.

Figure 33: Spread between Certificate of Deposit (CD) yields and 6-month SHIBOR
(Percentage point)
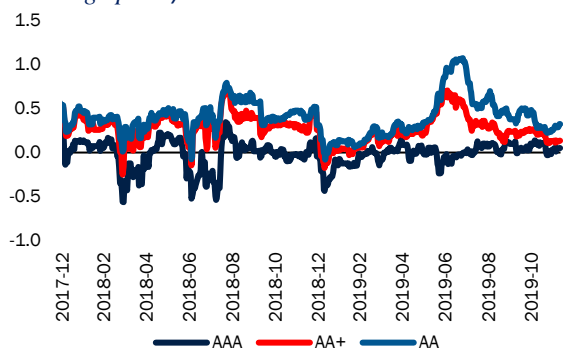
Source: Wind info, World Bank.
Note: SHIIBOR refers to Shanghai Interbank Offered Rate.

Figure 34: Corporate bond defaults
(Number; percent)
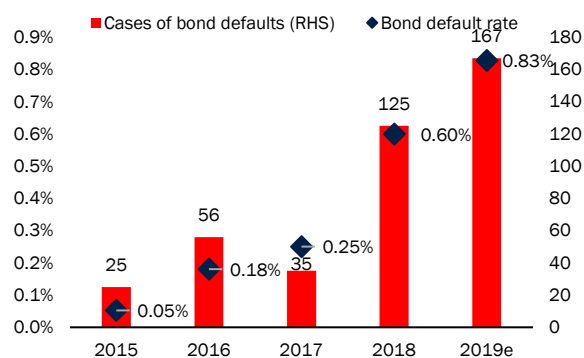
Source: Wind Info, World Bank.
Note: The default rate here measures the RMB value of defaults as a percentage of the overall corporate bond market capitalization.

Lower market liquidity, stricter regulations, and a weaker economy have contributed to more bankruptcy cases and bond defaults. According to the Supreme People's Court, 18,823 cases of compulsory liquidation and bankruptcy were filed in 2018, a dramatic increase from 5,665 in 2016 and 9,532 in 2017. Bond defaults are also on the rise. According to WIND Information Co., Ltd, China's corporate bond default rate was 0.8 percent from January-November 2019, up from 0.3 percent in 2017 and 0.6 percent in 2018 (Figure 34). By comparison, the average bond default rate was 1.5 percent in 1981-2018 for the S&P global sample of rated companies. While the number of defaults and bankruptcies is still relatively small, careful liquidity management by the PBOC would be crucial in ensuring that corporate debt distress does not become a systemic threat.

Policy Response has been Measured

The government has adopted targeted and measured policy support in light of the structural and cyclical nature of the slowdown. Monetary and fiscal support measures were employed to prevent a sharp cyclical downturn. The government also accelerated structural reforms to stem a decline of potential growth and put it on a more sustainable footing. Both the magnitude and composition of the stimulus differs from earlier downturns in 2008-2009 and 2015-2016 (Figure 35). The authorities have refrained from resorting to aggressive monetary easing, despite recent easing by other systematically important central banks, given high levels of indebtedness, currency depreciation pressures, and risks of capital outflow, which limit the scope for interest rate cuts. While credit growth has continued to decline in 2019, fiscal policies helped offset contractionary impacts of the credit slowdown. Fiscal stimulus, which is now increasingly done on-budget, is geared more toward consumption and the business sector, although public investment continues to play an important role (Figure 36).

The government has stepped up targeted fiscal support, including tax cuts and a higher limit on local government on-budget borrowing. The Ministry of Finance estimates that additional cuts in value-added tax (VAT) and personal tax, as well as a lowered social security contribution, amounted to about 1.8 percent of GDP in the first three quarters of 2019. In addition, local government special bonds totaling about 2.1 percent of GDP were issued to finance land reserve, shantytown development, and infrastructure investment, up from 0.8 percent of GDP during the same period. With revenues declining due to tax cuts, along with slower economic activity and buoyant expenditure growth, fiscal policy became more expansionary this year. The augmented fiscal balance is expected to register a deficit of 5.3 percent of GDP in 2019, compared

to 3.9 percent last year (Table 1 below). However, the larger on-budget deficit was partially offset by lower off-budget infrastructure spending by SOEs, which the government continued to rein in.

Figure 35: Monetary and fiscal impulse
(Percent of GDP)
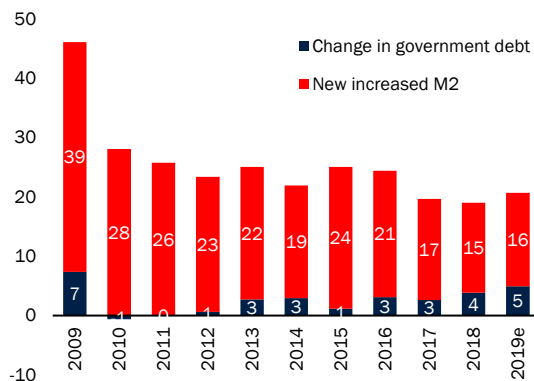
Source: PBOC, MOF, World Bank.

Figure 36: Composition of fiscal stimulus
(Percent of GDP)
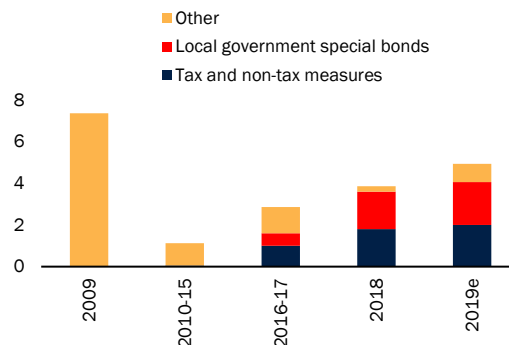
Source: MOF, World Bank.

Despite slower growth, the authorities have proceeded cautiously in easing the monetary policy stance. Twice this year, the central bank reduced the reserves that banks are required to maintain at the PBOC by a total of 1.5 percent of liquid liabilities. Nevertheless, after accounting for maturing medium-term lending facility loans and changes to open market operations, the PBOC only injected net liquidity of RMB 1.2 trillion in the first ten months of 2019, much lower than RMB 3.1 trillion during the same period last year (Figure 37). The PBOC has lowered the 7-day repo rate and medium-term lending facility rate marginally, despite three U.S. interest rate cuts this year. In addition, the PBOC has lowered the new benchmark Loan Prime Rate (LPR) marginally by less than 10 bps since its reform in August (Figure 38). The weighted average lending rates have edged down in response to the policy rate cuts.

Figure 37: PBOC liquidity provision
(RMB billion)
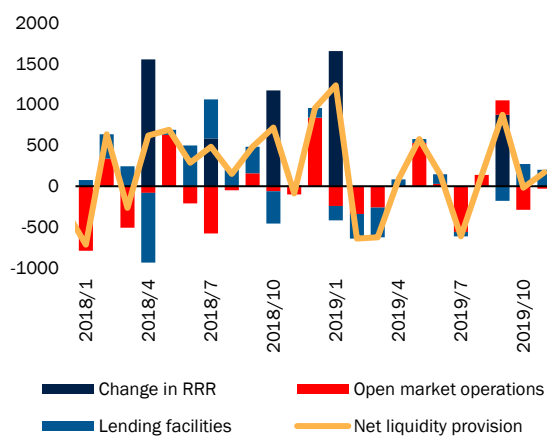
Source: PBOC, World Bank.

Figure 38: Loan rates and RRR cut
(Percent)
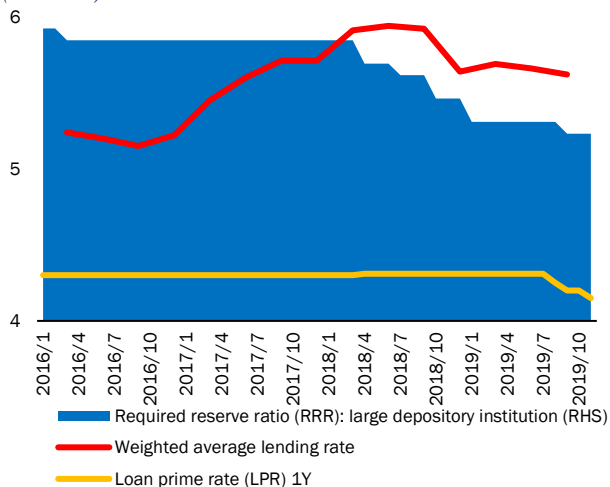
Source: PBOC, World Bank.

Figure 39: Ease of Doing Business, 2020
Score 0-100 (higher = better)

Source: World Bank.

The authorities have continued to deepen structural reforms, but challenges remain. New measures were rolled out to facilitate FX settlement and payments, lowering import administrative costs and streamlining customs and trade processes. With a view to attracting more FDI, China has been reforming its foreign investment regime and progressively expanding market access for foreign investors. The 2019 version of the negative list (released in June 2019) removed eight more sub-sectors where foreign investment is limited or prohibited, including oil and gas and some telecommunication-related services. China also reduced foreign ownership caps and operational restrictions, particularly in financial sectors. To further expand market access and level the playing field, China released a shortened "negative list" for market entry in November 2019, applicable to companies of all ownership types (SOE, private, and foreign) that contains 131 items—20 items fewer than previously. Investment in areas outside the "negative list" do not require administrative approval. China also issued new guidance to strengthen the protection of patents, copyrights, and other intellectual property rights (IPR). The guidance increases the maximum compensation for damages linked to IPR infringements and applies to the confiscation of illegal income and the destruction of counterfeit goods. The actual impact, however, would depend on the effective implementation of the regulations. Reflecting China's noteworthy improvements in the process of construction permitting, the strengthening of minority investor protection mechanisms, and contract enforcement, China now ranks 31st in the 2020 World Bank Doing Business rankings, climbing 14 positions from last year (World Bank 2019a). Still, China lags in areas such as paying taxes (105), obtaining credit (80), and trading across borders (56) (Figure 39).

II.   Short-Term Outlook, Risks and Policy Considerations

Short-Term Outlook

After decelerating to an estimated 6.1 percent in 2019, 0.1 percentage point below previous forecasts, growth is projected to slow further to 5.9 percent in 2020 and 5.8 percent in 2021, 0.2 percentage point below previous projections in both years. The outlook is predicated on gradually stabilizing but still subdued global trade. Growth in global goods and services trade, which is estimated to have slowed to 1.4 percent in 2019—the weakest pace since the global financial crisis—is projected to modestly recover to 1.9 percent in 2020 (Box 3).This projection already reflects the recent de-escalation in trade tensions. As a result, the balance of risks has improved. On the other hand, the forecast assumes that the improved external environment will reduce the need for policy support and enable the authorities to resume deleveraging.

The outlook assumes higher tariffs on bilateral trade between China and the United States compared to May 2019.[6] The baseline projections are predicated on the assumption that the commitments agreed to under the phase one agreement will be implemented. This includes the suspension of tariff hikes that had been scheduled to take effect December 15, as well as the reduction in September of the tariff rate from 15

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[6] Specifically, the projections are based on 25 percent higher tariffs on approximately $250 billion of China's exports to the United States implemented before June 2019, as well as a 7.5 percent tariff hike on about $112 billion of goods implemented in September 2019.

percent to 7.5 percent on around $112 billion Chinese imports. However, given the lingering uncertainty related to a more comprehensive and lasting resolution of deep-seated disagreements between China and the United States, a potential re-escalation of trade tensions remains a downside risk.[7] In a similar vein, a further de-escalation of trade tensions, and additional agreements beyond the phase one deal, present an upside risk to the outlook.

Box 3: Global outlook and risks

Global growth is expected to remain subdued over the forecast horizon. The global economic growth rate is projected to slow to 2.4 percent in 2019, reflecting a broad-based weakness in advanced economies and major (EMDEs). Global growth is then projected to broadly stabilize, reaching 2.5 percent in 2020 and 2.6 percent in 2021 (Figure 40). Growth in advanced economies is projected to moderate from 2.2 percent in 2018 to 1.5 percent on average in 2019-2021, reflecting a sharp deceleration in trade, investment, and manufacturing. Growth in EMDEs is projected to slow to 3.5 percent in 2019 before recovering to 4.1 percent in 2020, as earlier headwinds in some countries ease. This forecast in predicated on the waning impact of earlier financial pressures currently weighting on activity in some large EMDEs and no major deterioration in the global environment.[8]

Growth in the EAP region is projected to slow from 6.3 percent in 2018 to 5.8 percent on average in 2019-2020, and to ease further to 5.6 percent by 2021. This outlook assumes that the recent de-escalation of trade tensions between China and the Unites States endures. This outlook is also predicated on slightly lower commodity prices and supportive global financing conditions, especially in the near term. Growth in the region excluding China is projected to decline to 4.8 percent in 2019 and stabilize at 5 percent on average in 2020-2021. While growth in the region is projected to remain robust in the near term, underlying potential growth is likely to decline further over the long term, partly owing to deteriorating demographic trends.

Global economic conditions are expected to remain challenging over the forecast period. Barring a renewed escalation of trade tensions, global trade growth is projected to weaken from 4 percent in 2018 to 1.4 percent in 2019, and then recover modestly to 1.9 percent in 2020 (Figure 41). This forecast is predicated on policy support measures implemented in major economies and firmer domestic demand in some EMDEs. This modest rebound notwithstanding, global trade is expected to be weaker than previously envisaged over the forecast horizon, reflecting a softer outlook for global investment and evidence of a lower income elasticity of trade.

Global financing conditions are expected to remain volatile, even if generally more supportive. This reflects more accommodating monetary policy stances adopted by the major central banks over the course of 2019, due to deteriorating global growth prospects. Despite the recent recovery of EMDE markets from the 2018 correction episode, there is still a considerable risk of "monetary shocks" associated with the global policy uncertainty. Financial market volatility will continue to have the strongest impact on countries with high vulnerabilities, weak growth prospects, and elevated policy uncertainty. The eventual rise of advanced-economy yields will have a negative impact on capital flows to EMDEs. Policy uncertainty, geopolitical risks, and security concerns could also continue to adversely impact EMDE capital inflows.

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[7] As part of the phase one agreement, China reportedly committed to import various **U.S.** goods and services over the next two years in a total amount that exceeds China's annual level of imports in 2017 by no less than $200 billion. China reportedly also agreed to strengthen intellectual property provisions and technology transfe**rs**, remove barriers to imports of **U.S.** agricultural goods, further open up its financial services sector, and not engage in currency manipulation.

[8] These are working assumptions, which will be finalized and published in the January 2020 Global Economic Prospects, World Bank.

Modest declines are forecast for global commodity prices. Oil prices are expected to decline slightly to $59 per barrel in 2020 and 2021, with high uncertainty around the outlook. Overall, metals prices declined slightly in 2019. That decline is expected to continue in 2020, reflecting a weaker outlook for global metals demand. Agricultural prices are expected to remain broadly flat in 2020.

Risks continue to be firmly on the downside. Although unlikely in the near term, a simultaneous sharper-than-expected slowdown in China, the Euro Area, and the United States could trigger a significant downturn in global activity. The re-escalation of trade tensions could be highly disruptive to global activity amid the presence of complex value chains. The risk of severe and broad-based financial stress adversely affecting the outlook for EMDEs remains high, amid elevated debt levels in many countries. Policy uncertainty and geopolitical risks remain high and could negatively impact confidence and investment in affected countries and globally. An upside risk to the forecast is the possibility of a comprehensive, long and lasting de-escalation of trade tensions between the United States and China, which would likely boost regional trade.

Figure 40: Real GDP growth
(Percent)
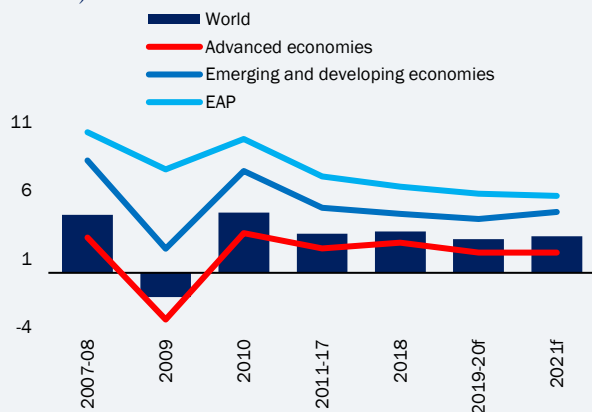
Figure 41: Global trade volume growth
(Percent)
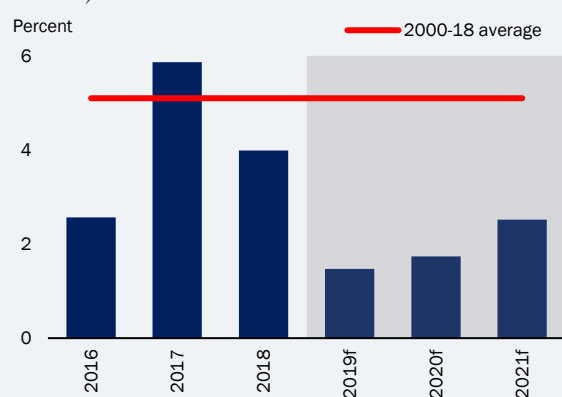
Source: World Bank.
Notes: Working assumptions. Updated global projections will be published in the forthcoming January 2020 Global Economic Prospects report, World Bank (World Bank forthcoming).

The baseline projections assume that the authorities will continue calibrating policies to prevent a widening of output gaps (Box 4). Additional fiscal easing is expected to partly offset the downward pressures associated with the lingering impact of trade tensions, softer property activities, and subdued fixed asset investment in the manufacturing sector. Monetary easing will proceed cautiously to avoid re-leveraging, currency depreciation, and risks of capital outflows.

Box 4: Is China's slowdown cyclical or structural?[9]

China's growth is slowing, with both structural and cyclical factors playing a role. To appropriately calibrate countercyclical policy, policymakers need to adequately distinguish between what is cyclical (demand related) and structural (supply related). The demand part of output is usually measured using the output gap in concert with other demand measures, including capacity utilization, unemployment, and other leading and lagging indicators. Unfortunately, the output gap is unobservable and needs to be estimated using economic models or filtering techniques, making it subject to a high level of uncertainty. This box uses a number of possible models to estimate the output gap in China. It is based on models

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[9] This box has been prepared by Franz Ulrich Ruch (EPGDR).

presented in the January 2018 *Global Economic Prospects* report of the World Bank and addresses the following questions:

- How has China's output gap evolved?
- How has China's potential growth evolved?

Definitions. The output gap measures the difference between what an economy is producing and what can efficiently be produced at full capacity—generally referred to as potential output. As a concept it is synonymous with the business cycle: the ups and downs, expansions and contractions, or booms and busts that occur over a number of years. This places the output gap at the heart of macroeconomic policy choices. Knowing where the output gap is and where it is going empowers monetary policy to appropriately react to the inflation that it creates. For fiscal policymakers, understanding that an economy is running above its capacity means that additional revenue should be saved, and that expenditures should not be expanded to match revenue growth that is unlikely to be maintained. When downturns come, negative output gaps signal a need to increase expenditures to support growth.

Many possible measures. The output gap and potential growth are not directly observable, and therefore need to be estimated. There are numerous approaches that can be used to estimate the output gap.[10] Ultimately, its estimation is about trying to isolate the cyclical part of output from the trend (from a statistical perspective) and supply side dynamics from demand (from an economic perspective). From the statistical perspective, filtering techniques naturally form the foundation for this work, including the Hodrick-Prescott and Kalman filters. The multivariate filter model used in this box estimates the output gap based on the Kalman filter and exploits the information available in other measures of capacity, including capacity utilization and unemployment.[11]

Significant uncertainty. The output gap is unobservable and is estimated using various approaches (see below). The number of models and filters available to estimate output gap estimates are large, and so too is the uncertainty around its true value. Uncertainty comes from a number of sources. It is the result of estimation, both from within models and between alternate models. It is also the result of revisions to existing data, as national accounts are revised and new datapoints become available, creating large ex post revisions in real time.[12] In China, these problems could be compounded by other factors, including statistical gaps in the national accounts. Consequently, the results need to be interpreted cautiously.

Output gaps appear to turn negative. China's output gap widened significantly at the onset of the 2009 global recession, reaching a nadir of -2.3 percent of potential output in 2009Q1 (Figure 42A). Growth remained relatively resilient during this period, due to an unprecedented policy response that saw China implement the largest fiscal stimulus following the crisis. Growth responded by rebounding, and the output gap turned positive, reaching a peak of 1.1 percent of potential output by 2011Q2. Since 2012, the output gap has not deviated substantially from zero. China's output gap turned negative in the second quarter of 2019, the first time since 2016. The output gap is estimated at -0.2 percent of potential output in 2019Q3, but given the uncertainty surrounding the estimation, it is not statistically different from zero.

Different methods co-move well. To establish some degree of confidence in its position, multiple methods are compared (Figure 42B). Three alternative filtering techniques presented here show that although there can be significant differences, most measures tend to co-move well and cluster. The

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[10] See, for example, Adolfson et al. (2011); Beneš et al. (2010); Borio, Disyatat, and Juselius (2016); and World Bank (2018).

[11] The multivariate filter model also uses information on credit, house prices, and commodity prices to create a finance-neutral output gap that accounts for the financial cycle (as in Borio, Disyatat, and Juselius 2016).

[12] The end point problem arises from the fact that statistical filters place a disproportionate weight on the last observation in the sample (Mises, Kim, and Newbold 2005). When this point is updated, the revisions to the output gap can be large. Borio, Disyatat, and Juselius (2016), which the model used is partly based on, show that incorporating additional information helps to alleviate the end point problem.

weakest correlation is between the multivariate filter model and the approach implemented by Hamilton (2018), at 0.43.[13] All methods suggest that China's output gap is negative as of 2019Q3, although the size of the output gap differs by 0.8 percentage point—from -0.9, based on the approach in Hamilton and -0.1, based on the HP-filter. These differences suggest that measures of the output gap should be used in conjunction with other measures of demand in the economy to determine its cyclical position.

Possible drivers of the output gap. Along with capacity utilization, inflation, and the unemployment rate, which are used in the multivariate filter model to identify the output gap, other measures that affect it directly include credit extension, house prices, and commodity prices. These can be recursively decomposed to identify the drivers of the output gap (Figure 42C).[14] House prices and credit extension have played a prominent role in output gap outcomes. As part of the government's response to the global recession, private sector credit extension grew rapidly in 2009-2010, peaking at 34 percent on an annual basis in November 2009. The strong growth in credit contributed an average 0.7 percentage point to the output gap during 2010. House price growth also contributed to the rebound in the output gap in 2010-2011, contributing 0.6 percentage point to the output gap in 2010. As credit growth slowed and house prices contracted, so did its contribution to the positive output gap. Another period of rapid credit growth in 2015-2016 generated another bump to the output gap. During this period, though, weakness in residential property prices counteracted some of the strong growth in credit, at least initially, as real house prices contracted, reaching a nadir of -7.4 percent in 2015Q1. Since 2018, however, credit has contributed negatively to the output gap, reaching -0.9 percentage point in 2019 as credit growth remained persistently below the double-digit growth it achieved over most of the last two decades (Figure 42D). Since February 2018, credit growth has averaged 9.1 percent. The Bank for International Settlements assessed the credit-to-GDP gap as close to zero in 2019Q2 compared to 23.5 percent of GDP in 2016Q1. Commodity price developments have also contributed to developments in the output gap, but to a much smaller scale. Most notable are the contribution to the recovery in 2010-2011 and the collapse in 2015.

China's potential growth

Slowing potential growth. After peaking at 11.7 percent in 2006, potential growth in China has persistently declined. In 2020, potential growth is effectively half, at 6.0 percent. Part 2 of this report discusses the specific structural reform options that are available to avert a sharper slowdown in potential growth.

Conclusion

For policymakers to appropriately implement countercyclical monetary and fiscal policy, an understanding of the demand side of the economy is required. The output gap provides this information. An accurate forecast of where the output gap is going can ensure that policy is appropriately calibrated. On the supply side of the economy, understanding potential growth dynamics and the drivers of potential growth help policymakers prioritize structural reforms that can ultimately boost long-term growth prospects.

Figure 42: China's output gap and credit growth

China's output gap turned negative in the second quarter of 2018. Potential growth is expected to slow to 6 percent in 2020 from 8.9 percent a decade earlier.

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[13] Hamilton proposed an autoregressive model as an alternative to the HP-Filter. Here, an autoregressive model with p = 4 (number of lags) and h = 4 (horizon) is estimated.

[14] The recursive decomposition is an equation-specific decomposition and only looks at the direct drivers of the output gap. Since the model is a system of equations, the output gap is identified and affected by more than just these variables. Decompositions are typically done to the shocks, which can provide an alternative narrative to the drivers of the output gap. The recursive decomposition should be seen as a complement to other possible explanations of output gap outcomes.

A. Output gap estimates
(Percent of potential output)

B. Various estimates of output gap
(Percent of potential output)

C. Decomposition of output gap
(Percent of potential output)

D. Credit growth
(Percent)

Source: Haver, International Monetary Fund, World Bank estimates.
A. Based on estimates from a multivariate filter as in World Bank (2018a). Last observation is 2019Q3.
B. Hamilton refers to the methodology proposed by Hamilton (2018)—an autoregressive model with p = 4 (number of lags) and h = 4 (horizon). HP = Hodrick-Prescott Filter, UC = Unobserved Components model, and MVF = Multivariate Filter model. See Chapter 3 of World Bank (2018) for details.
C. Recursive decomposition of the output gap equation. Unlike a shock decomposition, only variables in the output gap equation are decomposed. Figure 41 excludes the equation residual.

Sources of growth are expected to continue their gradual shift toward domestic demand led by consumption. Consumption will remain the main driver of growth, reflecting the growing share of private consumption expenditures spent on services. A recent shift in China's fiscal policy toward stimulating consumption is expected to partly offset the impact of the ongoing moderation of economic growth on household incomes. Specifically, recent fiscal measures to lower personal income tax and social security contributions are expected to support disposable incomes and stimulate household consumption.

Investment growth is expected to decelerate further due to tighter financing conditions and adjustments in the property sector (Table 1). The baseline assumes that the ongoing de-risking efforts would continue and weigh on credit growth and investment, despite recent policy rate cuts. In addition, slowing corporate profit growth amid continued policy uncertainty and weaker export prospects would continue to discourage manufacturing investment, despite confidence gains from the recent phase one agreement signed between China and the United States. The ongoing slowdown of housing sales in the

wake of weakening housing prices and a gradual dissipation of the shanty town subsidy plan is likely to weigh on investment growth in the real estate sector. Weak investment growth in manufacturing and real estate is expected to be partly offset by a pickup of infrastructure investment, reflecting a higher limit for local government on-budget borrowing. Stronger infrastructure investment will also be boosted by a recent policy change that allows a more flexible use of proceeds from the special bonds, including as equity capital for a broader range of infrastructure projects.

The baseline assumes that the trade flows recover modestly, but will remain subdued over the forecast horizon amid a fragile global outlook. Export growth is expected to weaken further in 2020, reflecting remaining higher tariffs on a large share of Chinese exports to the United States amid fragile global demand. The import contraction is expected to bottom out, reflecting a recovery in the electronics and manufacturing inventory cycle, as well as the recovery of China's imports from the United States. In 2021, both import and export growth are expected to pick up as the lingering effects of trade tensions dissipate and global demand stabilizes. The baseline scenario assumes that the contribution from net exports to growth will decline from an estimated 0.3 percentage point in 2019 to about zero in 2020 and will turn slightly negative in 2021. These projections, however, are subject to high uncertainty. Both upside and downside risks to this outlook are significant. On the upside, they reflect the prospects of a more lasting trade agreement. On the downside, they reflect a potential re-escalation of trade tensions amid the fragile global outlook.

On the supply side, economic growth will continue to shift from industry to services. Certain export-oriented industrial sectors will face a subdued outlook for exports, amid tight credit conditions. A transition from capital and resource intensive industries to services will accelerate, helped by policies aimed at cutting overcapacity, reducing excessive leverage, and easing business regulations, especially in the services sector. Overall, growth in services is expected to continue to outpace that of industry manufacturing, contributing more than half of GDP growth in 2020-2021.

Capital outflows are expected to remain manageable. China's current account surplus is projected to narrow, due to the moderation in goods surplus and an increase in outbound tourism. Nevertheless, a shrinking current account surplus will be compensated by higher FDI and portfolio inflows, partly in response to the opening up of China's capital market. Overall, capital outflows are expected to remain modest, especially considering China's cautious approach in capital account liberalization in the current uncertain and potentially volatile economic environment.

Inflation is expected to moderate. The headline CPI inflation is expected to moderate as pork prices normalize in response to the government's intervention to halt the spread of African swine fever. Core CPI is expected to inch up, assuming consumption growth picks up in response to government consumption support measures. Producer price index deflation may deepen more, reflecting further projected declines in commodity prices and subdued prospects for manufacturing investment.

China is on track to eliminate extreme poverty as defined by bare physical needs, but many remain vulnerable. Poverty rates are expected to continue to decline, but at a slower pace, reflecting projected robust but lower growth in household incomes. The poverty rate for people living on less than $1.9 a day (in 2011 PPP terms) is projected to fall from 0.33 percent of the population in 2018 to 0.18 in 2021. Thus, China is well on track to overcome the problem of extreme poverty as defined by bare physical needs. Going forward, the concept of poverty is likely to be redefined. Using a standard of people living on less than $5.5/day, which is adequate for China, the poverty rate is projected to decline from 18.7 percent in 2018 to 11.9 percent in 2021.

Table 1: China selected economic and social indicators, with projections from 2019-2021

China selected indicators	2016	2017	2018	2019f	2020f	2021f
Real GDP growth, at constant market prices	6.7	6.8	6.6	6.1	5.9	5.8
Private consumption	8.6	6.4	9.1	6.8	7.6	7.3
Government consumption	8.8	9.5	9.4	8.4	8.5	8.3
Gross fixed capital formation	6.8	5.2	4.9	4.0	3.9	3.8
Exports, goods and services	1.8	8.9	4.0	1.7	0.8	1.5
Imports, goods and services	5.7	6.6	7.5	-1.0	1.2	1.6
Real GDP growth, at constant factor prices	6.7	6.8	6.6	6.1	5.9	5.8
Agriculture	3.3	3.9	3.5	3.3	3.3	3.3
Industry	6.3	5.9	5.8	5.5	5.2	5.0
Services	7.7	7.9	7.6	7.1	6.8	6.7
Inflation (Private Consumption deflator)	2.0	1.6	2.1	3.0	2.6	2.4
Current account balance (% of GDP)	1.8	1.6	0.4	0.7	0.5	0.3
Financial and capital account (% of GDP)	-3.8	0.9	1.0	0.9	0.9	0.9
Net foreign direct investment (% of GDP)	-0.4	0.2	0.8	0.9	1.0	1.1
Public finance balance (% of GDP)	-2.9	-2.9	-2.6	-2.8	-3.0	-3.0
Augmented fiscal balance (% of GDP) [a]	-3.1	-2.5	-3.9	-5.3	-5.3	-5.3
Primary balance (% of GDP) [a]	-2.0	-1.2	-2.7	-4.1	-4.0	-4.0
Government debt (% of GDP)	37.0	36.5	36.9	39.3	41.8	44.0
International poverty rate ($1.9 in 2011 PPP) [b]	0.6	0.4	0.3	0.3	0.2	0.2
Lower middle-income poverty rate ($3.2 in 2011 PPP) [b]	5.9	4.6	3.5	2.7	2.1	1.6
Upper middle-income poverty rate ($5.5 in 2011 PPP) [b]	24.7	21.4	18.7	16.0	13.9	11.9

Sources: World Bank
Notes: f = forecast.
(a) World Bank staff calculations. The augmented fiscal balance (narrow definition) adds up the public finance budget, the government fund budget, the state capital management fund budget, and the social security fund budget. The primary balance is the difference between revenue and non-interest expenditures. The government publishes data for the public finance budget's fiscal deficit, which was 2.4, 2.9, 2.9, and 2.6 percent for 2015, 2016, 2017 and 2018, respectively, and is expected to reach 2.8 percent in 2019.
(b) Note: 2015 is baseline (actual data based on 20 data points). The poverty projections are produced based on the growth forecasts of 6.1, 5.9, and 5.8 percent for 2019, 2020, and 2021, respectively.

Risks

The balance of risks has improved, but risks to the forecast are still tilted to the downside amid a fragile global outlook and the lingering impact of trade tensions. Downside risks to the outlook include a renewed escalation of trade tensions and subsequent contraction in global investment and trade; a sharper-than-expected slowdown in major economies; and a sharp reversal of capital flows due to an abrupt deterioration in global financing conditions, investor sentiment, or geopolitical relations. Domestic risks stem from potential distress in parts of the financial system that may intensify, amid the economic slowdown and still highly leveraged corporate balance sheets and slower consumption growth, weighed by growing household debt and widening income inequality. Growth may suffer from the potential adverse effects of financial de-risking, given its asymmetric impact on private sector financing and the risk of a disorderly unwinding of excessive leverage. A slowdown in structural reforms would not only erode investor confidence in the short term, but also weigh on potential growth in the medium term. An upside risk to the outlook is the possibility that the ongoing de-escalation of trade tensions between China and the United States endures, and also dissipates policy uncertainty and improves confidence, thus boosting investment, trade, and growth.

Externally, a renewed spike in trade policy uncertainty, for example, due to renewed trade tensions between major economies, could cause a deterioration in confidence, investment, and trade. A failure by China and the United States to reach a comprehensive, long-term, and lasting agreement could lead to a further escalation of trade tensions, with broad-ranging consequences. A sharper-than-baseline deceleration of activity in large economies—the Euro Area or the United States—could have adverse repercussions for China through weaker demand for exports and the disruption of value chains, as well as through financial, investment, commodity, and confidence channels (World Bank forthcoming; World Bank 2016a; DRC and World Bank 2019).

In addition to external risks, China also faces risks related to a sharper-than-expected slowdown in economic growth, stemming from domestic challenges. The total leverage of the economy—measured as the ratio of total credit (general government and non-financial private sector) to GDP—has surpassed 260 percent of GDP in 2019, although the share of non-bank lending continued to decline due to regulatory tightening. High corporate indebtedness in sectors with weak profitability is of concern (World Bank, 2019e). In addition, a sizable portion of recent support measures has taken the form of expanding local government special bond quotas. The growing debt burden on local authorities may increase their vulnerability to shocks. The rising household indebtedness could boost consumption in the short run, but may weigh on consumption in the medium-term term.

Domestic vulnerabilities in China could amplify the impact of external shocks. Continued defaults in local and regional banks or in large segments of the shadow banking system, an abrupt adjustment in property prices, or sudden sizable outflows of capital, combined with a sharp correction in asset prices, could all propagate through the highly leveraged financial system. Moreover, China's transition toward slower growth may trigger an abrupt unwinding of financial excesses in the absence of deeper structural reforms. Corporate deleveraging may act as a persistent drag on activity, as is commonly the case following periods of rapid debt accumulation (World Bank forthcoming). Productivity growth could stall if the economy fails to reform through measures to enforce a stronger competition policy framework and provide a level playing field for all market participants (DRC and World Bank 2019).

Policy Considerations

Heightened external and domestic risks call for responsive macroeconomic policies. Macroeconomic policies would need to continue to balance reduction of cyclical downside risks to growth with necessary reforms to deleverage and contain unsustainable debt accumulation. This may require tolerating slower but safer growth in the short term. In addition, maintaining a flexible exchange rate is especially important to adjust to potential external shocks and volatility. Should domestic and global demand weaken more sharply than expected, available fiscal space at the central level could be deployed to stabilize the economy, but should be designed to reinforce shifts toward consumption and private sector investment. If fiscal stimulus involves public investment, the central government could explicitly provide financial resources through transfers to local governments and target national priorities, such as addressing air and water pollution and other public goods of national importance and benefit. On the monetary front, general easing should proceed cautiously unless core inflation falls well below target, to avoid reigniting excessive credit growth. Similarly, macro-prudential policies would need to continue to aim at de-risking and should not be used to ease liquidity conditions as part of a cyclical policy response (Table 2).

Steps to solidify macroeconomic stability would need to be complemented by structural reforms and continued efforts to work with trading partners to achieve a comprehensive and lasting resolution of trade disagreements and preserve a rule-based, mutually beneficial investment and trade system. The central, medium-term challenge for the Chinese economy remains the structural rebalancing from an investment and export-led economy based on labor-intensive manufacturing toward one led by domestic consumption, services, and productivity. Achieving this objective will require sustaining a coordinated and deep structural reform package over the medium-term (Part III). This includes steps to further reduce

regulatory constraints and ease barriers to trade and investment, especially in services sectors. More efficient capital, land, and labor markets that respond to market signals would enable reallocation of resources toward more productive firms and sectors. Reforms of the "*hukou*" (household residency registration system) are crucial to facilitating labor mobility and mitigating the social impact of economic restructuring. In the financial system, continued efforts to deleverage need to be complemented by steps to address remaining distortions in financial intermediation, which continue to favor SOE—including widespread perceptions of implicit state guarantees. At the firm level, reforms would need to encourage the entry of new, efficient firms, and facilitate the restructuring and exit of less efficient ones through stronger competition policy frameworks and a leveling of the playing field for all market participants. Pension, health, and tax system reforms would help to address income inequality challenges and reduce incentives for excessive household savings.

Table 2: Policy options

	Existing Policies	Policy Space (+) / Constraints (-)	Options
Exchange rate	- Exchange rate flexibility as shock absorber	(+) Facilitate adjustment to external shocks (-) Risks of capital outflows limit the scope for further adjustment (-) Currency manipulation allegations by trading partners	- Allow two-sided exchange rate flexibility supported by communication and enhanced transparency
Monetary/Financial	- Policy rates (MLF, Repo, LPR) lowered marginally - Reduction in Required Reserve Ratios - Limited money injection into the financial system - Credit encouraged to be allocated toward SME and private sector -Regulatory tightening to reduce non-bank lending	(+) Global easing provides some space (-) May reverse de-risking of financial sector (-) Currency depreciation pressure and risks of capital outflows limit the scope for interest rate cuts	- Maintain de-risking campaign and regulatory tightening - Targeted easing - Improve credit allocation
Fiscal	- Tax, non-tax and social security contribution cuts - Higher limit and wider use for local government on-budget borrowing with a shift toward on-budget operations	(+) Fiscal space at the national level (-) Diminishing returns to infra investment (-) Limited effectiveness of tax cuts and low multipliers of consumption	- Fiscal resources directed toward improving the quantity and quality of public services - More progressive tax system and enhanced horizontal equalization - If investment is used it should be done on-budget
Structural	- Measures to ease doing business and to promote market competition - Accelerated opening up, particularly service sectors (such as finance)	(-) Impacts may take time (-) Challenges in implementation	- Intensify SOE reform - Further liberalize foreign investment and trade in services

III. Structural Challenges

Constraints to Sustainable Growth

After years of rapid growth, accompanied by dramatic poverty reduction, China now faces three key growth-related challenges. First, potential growth—which peaked at 11 percent in 2006—is now in a secular decline. By 2020, World Bank estimates suggest it will have fallen by over 5 percentage points to 6 percent (Figure 44), with a further slowdown anticipated thereafter. Some of this decline has been inevitable, as China converges rapidly with high income countries. Growth moderation, however, also reflects the impact of the rapidly aging population and—perhaps of greatest concern—declining and now relatively tepid productivity growth. Second, as is well recognized, China's growth over the last decade has been excessively dependent on credit and investment; this is now unsustainable. In the future, private consumption and private investment must increasingly play a leading role. Third, in contrast to past decades, China's economic transition will be challenged by weak global demand and an uncertain global environment (Box 5; World Bank 2018a). Against this background, a comprehensive and coordinated set of policies is needed to stabilize potential growth and put it on a more sustainable footing, including measures to boost total factor productivity, improve the efficiency of public and quasi-public investment, encourage more private investment, and promote consumption-led growth.

Box 5: Long-term global prospects[15]

There has been a prolonged period of increasingly weaker growth expectations, measured by the evolution of the 10-year-ahead forecast, during which long-term forecasts were systematically downgraded (Figure 43A). Specifically, since the onset of the global financial crisis, long-term growth forecasts steadily declined, from 3.3 percent in 2010 to 2.5 percent in 2019. This weakness in growth expectations is broad-based, with both advanced economies and EMDEs witnessing deteriorating long-term growth forecasts.

The subdued 10-year-ahead growth forecasts are broadly consistent with the estimates of potential growth—the growth rate an economy can sustain at full employment and capacity utilization. Global potential growth has steadily declined over the past decade to 2.5 percent, which is about 1 percentage point less than a decade ago (Figure 43B). This decline affected both advanced economies and EMDEs. Potential growth in advanced economies has declined by 0.8 percentage point, from 2.2 to 1.4, and in EMDEs by 1.1 percentage point, from 5.9 percent to 4.8. Almost half of EMDEs and most advanced economies, which together account for more than two-thirds of global GDP, now have potential growth below their respective long-term average rates (World Bank 2018a).

The slowdown in global potential growth over the past decade mostly reflected weak investment growth (Figure 43C; World Bank 2019b). In addition, about one-quarter of the slowdown in global potential growth was due to an easing of the labor supply, and just over one-quarter was due to slowing productivity growth. This largely reflects deteriorating global demographic trends. In the past five decades, global growth was supported by rapidly growing working-age populations. This trend continued until the mid-1980s in advanced economies and around 2010 in EMDEs (Figures 43D). Since 2000, countries with rising shares in their working-age populations accounted for half of global output growth and three-quarters of global GDP levels. With the retirement of the baby boom generation and lower fertility rates, demographic trends have turned less favorable to growth.

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[15] This box draws on the World Bank January 2018 Global Economic Prospects (GEP) report (World Bank 2018a) and January 2019 GEP (World Bank 2019b).

Since the Asian financial crisis, growth in the East Asia and Pacific region (EAP) has been twice as high as the EMDE median; however, it has slowed sharply. At around 7 percent during 2013–17, potential growth in the EAP was still about twice as high as the average for other EMDEs. But this pace is well below the rates achieved over the last two decades. In large part, this reflects slowing potential growth in China, from around 10 percent during 2003–2007 to 7 to 8 percent during 2013–2017, or about 1.3 percentage points below its longer term (1998–2017) average.

Unless there is a surprise productivity surge or investment surge, global potential growth will continue to slow. Based on past trends, global potential growth will slow by another 0.2 percentage point from 2.5 percent in 2013-2017 to 2.3 percent over the next decade (2018-2027). Potential growth in advanced economies will slow by 0.1 percentage point, from 1.4 percent to 1.3 percent and in EMDEs by 0.5 percentage point, from 4.8 percent to 4.3 percent. This broad-based slowdown will affect more than half of advanced economies and almost two-third of EMDEs, which together account for 78 percent of global GDP.

This expected growth slowdown over the next decade could be compounded by the effects of climate change and the challenges that EMDEs may face as disruptive new technologies emerge. A menu of policy options could help reverse this trend, including comprehensive policy initiatives to lift physical and human capital, encourage labor force participation, and improve institutions. A combination of additional investment, better educational and health outcomes, and reforms to the labor market and business climate, in addition to governance reforms, could stem or even reverse the expected decline in potential growth over the next decade.

Figure 43: Long-term prospects and challenges

A. Global output growth
(Percent)
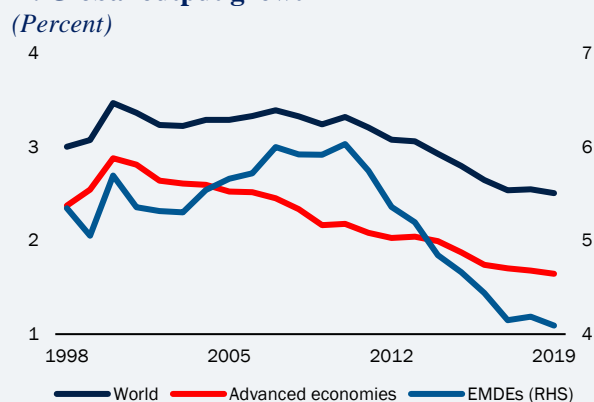
B. Potential growth
(Percent)
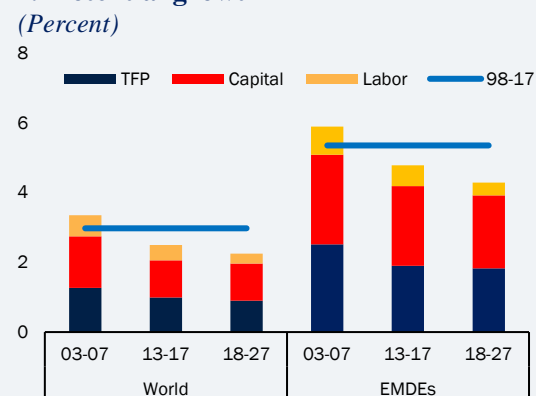
C. Global investment growth
(Percent)
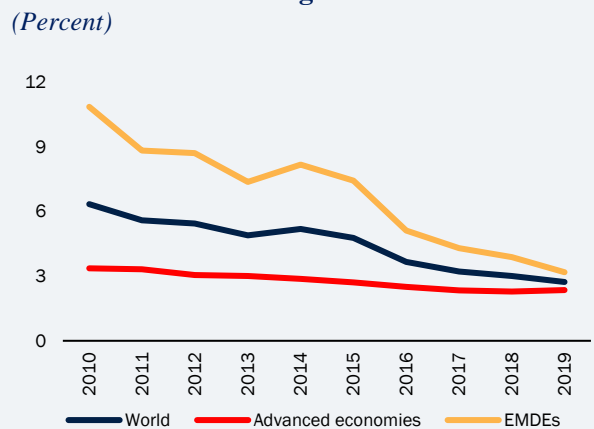
D. Working-age population, by group
(Percent of total population)

36
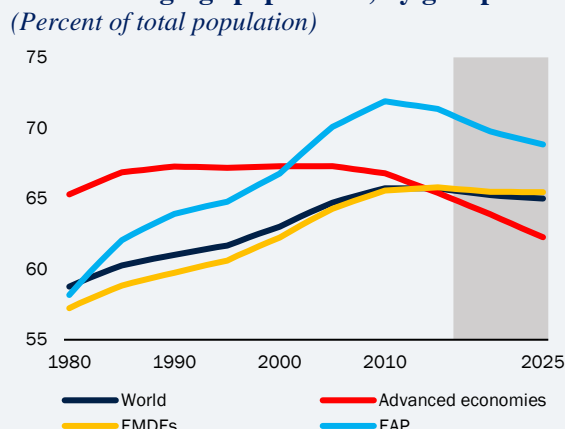
Sources: Consensus Economics, United Nations, World Bank.
A. Ten-year-ahead output growth forecasts surveyed in indicated year, using constant 2010 U.S. dollars. Annual averages of results from multiple surveys conducted in each year. The horizontal axis refers to the year of the consensus forecast surveys. Sample includes 38 countries, consisting of 20 advanced economies and 18 EMDEs. Global, advanced-economy, and EMDE growth is computed with constant 2010 U.S. dollar GDP weights.
B. GDP-weighted averages of production function-based potential growth estimates. TFP growth stands for total factor productivity growth. Sample includes 30 advanced economies and 50 EMDEs.
C. Ten-year-ahead investment growth forecasts surveyed in indicated year, using constant 2010 U.S. dollars. Investment refers to real gross fixed capital formation (public and private combined). The horizontal axis refers to the year of the consensus forecast surveys. Sample includes 23 advanced economies and 20 EMDEs. Global, advanced-economy, and EMDE growth is computed with constant 2010 U.S. dollar investment weighted averages.
D. Population-weighted averages. The working-age population is defined as people who are 15-64 years old. Shaded area indicates forecasts.

Boosting Productivity[16]

Over the last decade, China's growth has become overly reliant on capital accumulation, while growth of both total factor productivity and the labor force slowed markedly. Capital accumulation has accounted for about three-quarters of China's GDP growth over the past decade (Figure 45). This reflects in large part a massive fiscal stimulus that was launched in 2009 to offset the impact of the global financial crisis, with the largest share of investment capital allocated to local governments. By contrast, the contribution of total factor productivity—a key driver of China's GDP growth until the global financial crisis—declined significantly over the past decade. While many countries have experienced slower TFP growth since the global financial crisis, the TFP slowdown in China was sharper compared to other economies in the region. The contribution of labor force growth to potential output growth has also declined sharply as China's population has started a rapid aging process (World Bank 2018a; 2018b).

Figure 44: Potential growth
(Percent)
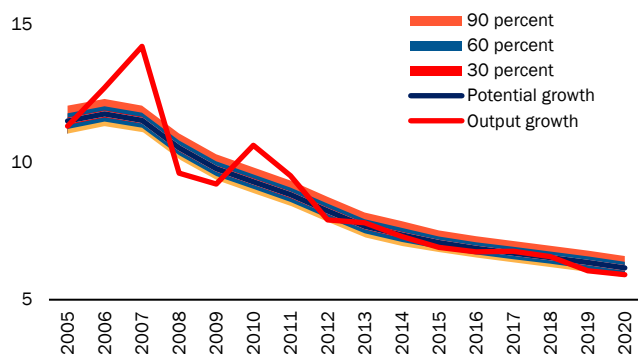
Source: Haver, World Bank.
Note: Based on estimates from a multivariate filter as in (World Bank, 2018). Last observation is 2019Q3.

Figure 45: Decomposition of GDP growth
(Percentage points)
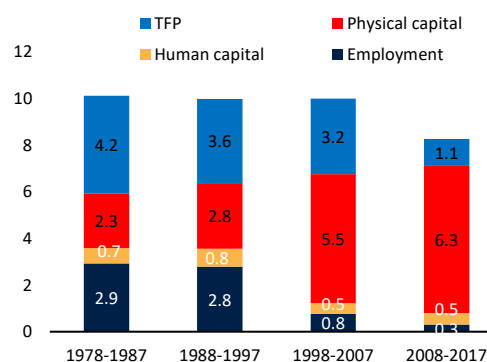
Source: NBS, PWT 9.1, World Bank.

Since late 2016, China has been pursuing important policies and reforms that are consistent with reversing the negative trends in productivity growth. The aim of these reforms is to curtail excessive

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[16] This section draws heavily on the WB previous work, including 2018 January GEP, 2018 EAP Economic Update, and Innovative China (DRC and World Bank 2019). It presents a brief summary of the earlier findings.

investment in increasingly less productive infrastructure and real estate. Indeed, the rise in the capital-output ratio in China since the global financial crisis can be attributed almost entirely to investment in infrastructure and housing. By contrast, the business sector of China's economy did not exhibit the same rapid decline in the return to capital (DRC and World Bank 2019). A package of measures was issued to implement the Revised Budget Law to harden the budget constraints for local governments, restrict off-budget borrowing, and increase responsibility for debt management. Regulatory changes have been implemented to limit risky exposures of commercial banks to the shadow market and to reduce their dependence on the interbank market.

Despite recent reforms, a large part of China's labor force continues to be employed in relatively low productivity activities, including in agriculture and low value services. Reallocation of resources (labor and capital) to more productive sectors or firms, and product upgrading can help bolster productivity growth and sustain rapid high-quality economic growth.[17] Firm-level data suggests firm exits and reallocation of productive resources among firms has not played a large role in supporting total factor productivity (TFP) growth in China. In addition, the contribution to TFP growth from new firms entering the market has substantially declined (Figure 46). This suggests inefficiencies in the allocation of resources (labor, land, and capital) from less to more productive firms and barriers to exits of poorly performing firms.

Figure 46: Decomposition of annual TFP growth in manufacturing, 1998–2013
(Percent)

Figure 47: China's TFP relative to the global technology frontier
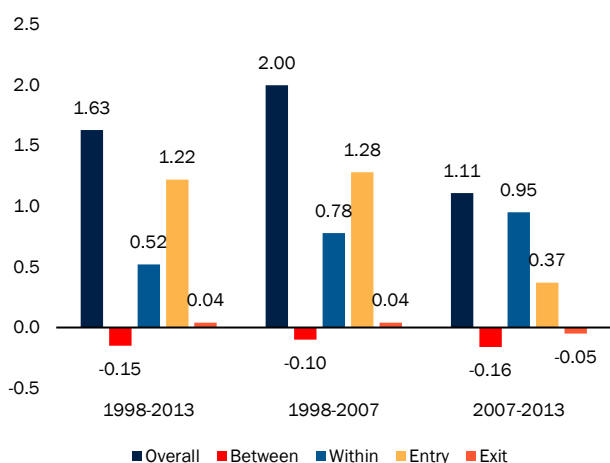

Source: DRC and World Bank (2019).
Note: Calculations excluded firms that have switched between sectors in the sample period. The number of such firms was small.
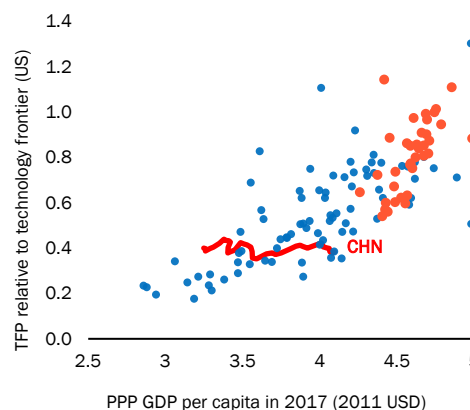
Source: DRC and World Bank (2019).
Note: Orange dots denote OECD countries. Calculations are China's TFP relative to the United States at historical levels of income per capita (red line) compared with the 2017 relative TFP of other countries, log scale.

There are also vast productivity gaps across firms in China, even within individual sectors. Productivity dispersion among companies in the same industry in China is much higher than in the United States. The productivity dispersion between the best performing and the worst performing companies also seems to have been growing over time. Meanwhile, productivity gaps between the state-owned and private

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[17] There are two underlying forces that drive productivity growth: i) reallocation of resources to more productive sectors, firms, and activities, and ii) technological and/or product upgrading.

sectors also persist, although these gaps seem to have narrowed over time. In 2014, China's TFP was less than half the U.S. level and trailed a number of other middle-income countries (Figure 47). This suggests that there is still much room for China's firms to catch up to global leaders through the transfer of technology, state-of-the-art management practices, and greater competition.

Policy Considerations[18]

Comprehensive policy efforts can help China improve productivity growth and move toward income convergence with the advanced economies. These policies fall into four broad categories: improving factors of production, including through human development; encouraging firm productivity, including through leveling the playing field for private and state-owned firms and improving corporate governance; removing obstacles to between-sector reallocation, including through continued urban development and reforms of the household registration system; and fostering a productivity-friendly business environment. In addition, achieving long-term sustainable development requires addressing the debt overhang and avoiding a buildup of excessive leverage.

To sustain productivity and innovation-driven growth, China will increasingly need to shift investments from physical capital to human capital. China's future growth will increasingly depend on the quality of its human capital. Policy makers need to start preparing China's workers today for the future. To help workers develop the needed cognitive and interactive social skills to compete in a market increasingly dominated by automation, reforms would need to address the vast regional and socioeconomic disparities in educational attainment, as well as ensure that school curricula promotes creativity, as well as cognitive and cognitive social skills across education tiers and vocational training (DRC and World Bank 2019).

Comprehensive reforms to improve the business climate and the innovation and entrepreneurship ecosystems would help increase productivity in China. China could rely less on industrial policies that target specific sectors and firms, and instead embrace policies that improve factor markets and the broader business environment and promote market competition. Opening more sectors to private and foreign investment would promote greater competition. Increasing competition is particularly beneficial for the services sector, where China's market restrictions are greater than those in OECD countries. Reducing regulations and improving the local business climate would support entrepreneurship more than providing support for firms through government subsidies or financing. State-owned enterprise (SOE) reforms would complement the improvement of the business climate and the promotion of market competition by helping to ensure fair competition (World Bank 2019a).

Efficient allocation of resources is central to the dynamism of the economy and boosting productivity in the long run. With its working population expected to age and decline, China will need to access the underutilized labor in agriculture, increase female labor participation, and extend the working lives of its labor force. A key priority is to continue reforms of the *hukou* system—China's household registration system—to promote labor mobility. Consolidating the fragmented pension and social security system would enhance labor mobility and the allocative efficiency of labor. Financial sector reforms would need to aim at enhancing the allocation of capital to more productive investment, especially in the private sector. China's financial system continues to channel a large share of the country's vast domestic savings to the state sector while depriving private firms and especially SMEs of access to affordable financing.

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[18] This section draws on the detailed recommendations developed in DRC and World Bank (2019).

Box 6: Strengthening trade integration in the age of global value chains[19]

Global value chains (GVCs) powered an economic revolution over the past three decades. Over the past 30 years, GVCs have helped developing countries grow faster. As growth accelerated, household incomes rose, and poverty rates declined sharply. Global value chains (GVCs) account for almost 50 percent of global trade today (Figure 48). They can further boost inclusive and sustainable growth, create better jobs, and reduce poverty. A one percent increase in GVC participation is estimated to boost per capita income levels by more than one percent—about twice as much as conventional trade (World Bank 2019c).[21]

Figure 48: GVC trade grew rapidly over the last four decades[20]
(Percent)

Source: WDR 2020 team, using data from Eora26 database and Johnson and Noguera (2017).

Trade conflict and the lack of major reforms may inhibit GVCs from remaining a force for prosperity. The expansion of GVCs has plateaued since 2008, due to a decline in overall economic growth and the slowing pace of reforms (Figure 49). Pursuing predictable and constructive policies in major economies, speeding up trade and investment reforms, and improving connectivity in developing countries will be needed for GVCs to continue to be a force for sustainable and inclusive development. Trade tensions and uncertainty will impede investment and growth, resulting in stagnating incomes and raising poverty.

Countries need to work cooperatively to address policies that distort trade and to keep markets open. Public policies and economic conditions in one country strongly affect trade partners through production linkages. The benefits of coordinated policy action are even larger with GVCs than conventional trade, as goods and services cross borders multiple times. Creating an open and secure climate for investment is vital for GVC participation. The trade system has faltered in recent years, most notably with the failure of the Doha negotiations. Regional initiatives, such as the European Union and NAFTA, have also been hurt by disagreements among member countries.

Deepening traditional trade cooperation is essential to sustaining beneficial trade openness. Countries could enhance trade integration in several ways. First, they could reduce tariff and nontariff barriers, especially in agriculture and services. Second, they should design stronger rules on subsidies and SOEs, allowing for a competitive environment. Third, special and differential treatment for developing countries should be revised to incentivize reforms that boost GVC participation and integration into the global economy. Fourth, they should combat tariff escalation. Finally, any trade
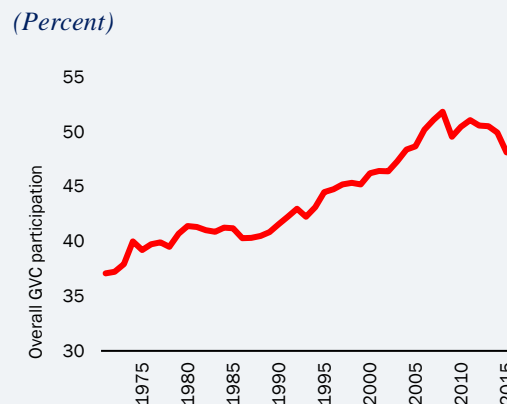
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[19] This box is based on the conclusions of World Development Report 2020.

[20] GVC participation corresponds to the share of world exports that flow through at least two borders. For 1990–2015, the GVC participation measure (based on the Eora26 database) is computed as the share of GVC exports in total international exports. GVC exports include transactions in which a country's exports embody value added that it previously imported from abroad (backward GVC participation), as well as transactions in which a country's exports are not fully absorbed in the importing country and instead are embodied in the importing country's exports to third countries (forward GVC participation). For 1970–90, the GVC participation measure is backcasted using the estimate by Johnson and Noguera (2017) of value added to gross exports (VAX), an older measure of the value-added content of bilateral trade. Although the difference between VAX and the GVC participation measure is sizable, the correlation of the change over the overlapping years (1990–2009) is 0.97. This method allows reconstructing a long series covering 1970–2015 rather than simply 1990–2015 for which the Eora26 database is available.
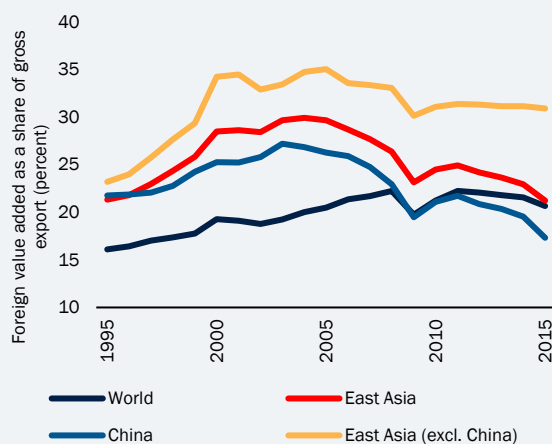
[21] World Development Report 2020.

negotiations to deepen cooperation may deliver better outcomes if major developing countries engage as equal partners, and if countries continue to place their faith in a rules-based trade system.

Countries should look beyond trade to keep it open and beneficial. To ensure that the benefits of GVC participation are shared and sustained, countries should strengthen social and environmental protections. To maintain meaningful cooperation, countries should ensure fair access to tax revenues that would eliminate firms' incentives to shift profits and do away with incentives for countries to compete over taxes. In addition, regulatory commitments to protect consumers' data from exporting firms are needed to minimize risks of anticompetitive practices and to ensure privacy practices are followed. Finally, the growing, more distant trade in intermediate goods compared with standard trade can lead to higher carbon dioxide (CO_2) emissions from transportation and excess waste from the packaging of goods. Pricing environmental degradation can prevent GVCs from magnifying misallocations of resources.

Figure 49: GVC participation is slowing in East Asia
A. Backward GVC participation   **B. Forward GVC participation**
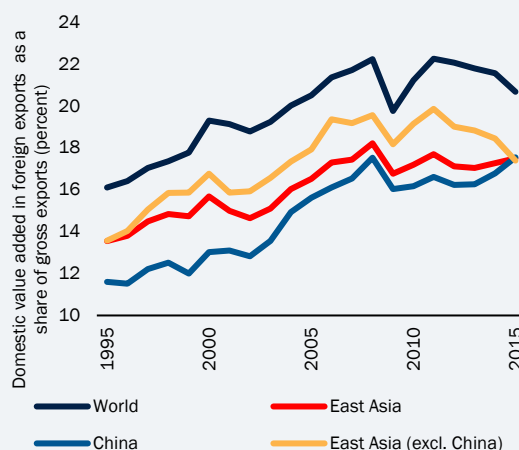
Source: OECD TiVA and authors' calculations.
Notes: Countries included in the East Asia group: Cambodia, China, Indonesia, Malaysia, the Philippines, Thailand, Vietnam. Growth rates based on OECD TiVA 2016 are used to extend the series based on OECD 2018 up to 1995. Backward GVC participation, which is the import content of exports, defined as the foreign and domestic value in imported inputs that are re-exported. Forward GVC participation in exports (value of domestic productions re-exported by the bilateral partners).

China's top-down approach to promoting innovation could be complemented with a more bottom-up, market-oriented, and decentralized approach by expanding research and development tax credits and other innovation support programs that are open to all industries. Strengthening the national innovation system requires not only promoting the discovery of new innovations but also supporting the dissemination and adoption of existing innovations and technologies. Protecting intellectual property rights will help level the field and enhance competition and innovation.

Sustaining and deepening China's integration in global markets and supply chains would ensure that firms in China continue to converge to the global productivity frontier. The benefits of preserving and deepening China's integration in world markets are substantial. Continuing to remove barriers to cross-border trade and investment would bolster productivity growth through greater competition and access to foreign technology (World Bank 2016b). Working with trading partners and achieving a comprehensive and lasting resolution of trade disputes would help reduce uncertainty and rejuvenate investment, trade, and manufacturing growth. Building on the progress made with the new FDI law and reductions in selected import tariffs, a level playing field for domestic and foreign companies can be ensured by reducing entry

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barriers for foreign investment, including in services sectors; providing greater protection of intellectual property; and assuring equal access to government procurement.[22] Given the growing economic importance of Asia, there are also significant long-term benefits to advancing stronger regional integration (DRC and World Bank 2013). Recent progress in negotiations concerning the Regional Comprehensive Economic Partnership (RCEP) is a positive step in this direction (Box 6).[23]

Consumer Power

One of China's key challenges is the need to stimulate consumption to boost domestic demand. In most advanced economies, private consumption constitutes about two-thirds of GDP. Promoting domestic consumption growth will help to reshape domestic markets and stimulate the production of goods and services that better respond to China's growing and increasingly urban middle class, and its aging population.

China's consumption remains low, despite some pickup over recent years. Following several years of decline, household consumption in China bottomed out at 35.6 percent of GDP in 2010 and reached 39.4 percent in 2018 (Figure 50). Nevertheless, China remains an outlier in terms of the share of consumption in its GDP compared to its peers. For example, the upper middle-income countries (excluding China) spend, on average, around 64 percent on household consumption. China also has an unusually low level of per capita consumption (Figure 51).

Figure 50: Rebalancing from investment to consumption for China
(Percent of GDP)
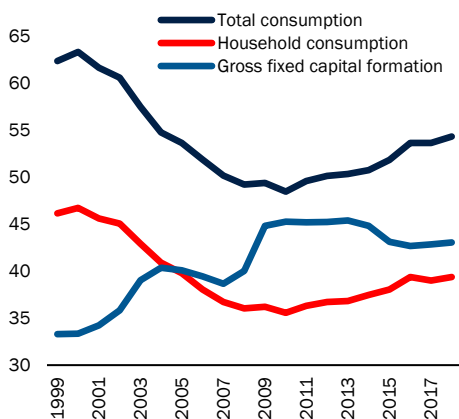
Source: NBS, World Bank.

Figure 51: Household consumption per capita
(Consumption versus GDP, PPP USD thousand per person, 2012-17 average)
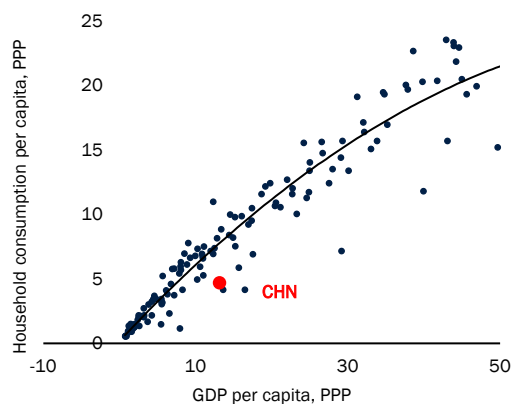
Source: WDI, World Bank.

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[22] On March 15, 2019, the National People's Congress (NPC of China approved the Foreign Investment Law at the closing meeting of the second session of the 13th NPC, which will come into force on Jan. 1, 2020. When it takes effect, the new FIL will consolidate and replace the three laws governing foreign investment and foreign invested enterprises that were in effect until now. Beyond the consolidation effect, the FIL also introduces a number of positive principles, such as: (a) prohibiting mandatory technology transfers; (b) strengthening guarantees (protection) for investors and investment; (c) ensuring stronger protection of intellectual property rights; (d) providing equal treatment of foreign investors in terms of accessing government procurement, raising capital, enjoying preferential policies, and participating in the formulation and application of standards, and; (e) establishing a new mechanism for the resolution of foreign investor grievances/complaints.

[23] The RCEP includes 15 economies in the Asia-Pacific region (Australia, Brunei Darussalam, Cambodia, China, Indonesia, Japan, Republic of Korea, Lao People's Democratic Republic, Malaysia, Myanmar, New Zealand, Philippines, Singapore, Thailand, and Vietnam), which together account for close to 30 percent of global GDP, 30 percent of the world's population, and one-quarter of world trade.

A declining household income was the most important factor contributing to the decline of the consumption share of GDP in the decade ending 2010. The household sector's share of gross national disposable income fell noticeably through the 2000s (Figure 52). Flow-of-funds data suggest that the household income as a share of national income was primarily weighed down by the falling share of labor compensation, although a fall in the shares of government transfers and investment income also contributed to the decline (Ma et al. 2016). Some observers attribute the falling labor income share to the relaxation of controls on internal migration under the *hukou* system. This permitted a surplus of rural labor to flow into urban areas, exerting downward pressure on wages (Perkin 2015). This drop in labor income as a share of national income can also be explained in part
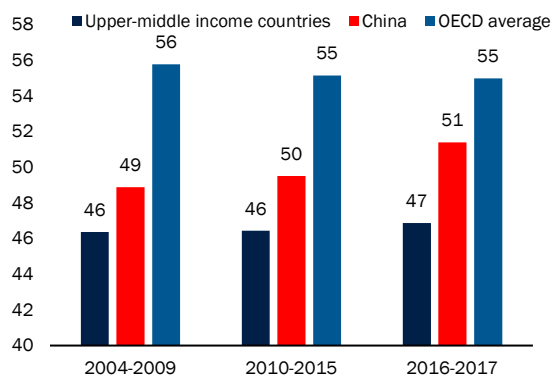
Figure 52: Household disposable income and labor income share in China
(Percent of GDP)
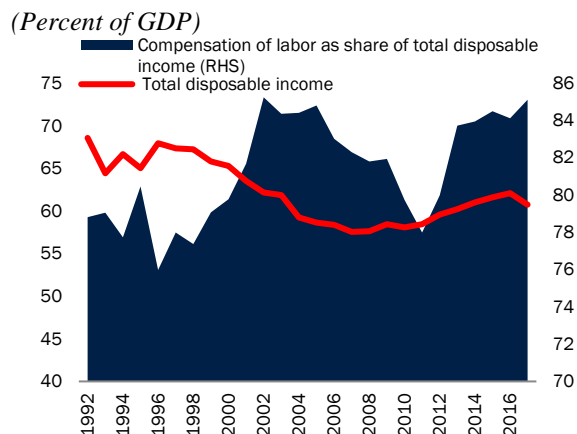
Source: NBS, World Bank staff calculations.

by the shift of labor from agriculture to industry and services. In agriculture, labor remuneration accounts for about 90 percent of value added, while it is about half of that in industry and services. As more people move out of agriculture to more productive capital-intensive manufacturing, the share of labor in GDP declines, even though wages increase (DRC and World Bank 2019).

Figure 53: Labor income share
(Percent of GDP)

Source: International Labour Organization global labor income share and distribution database, World Bank.

Figure 54: Household disposable income share
(Percent of GDP)
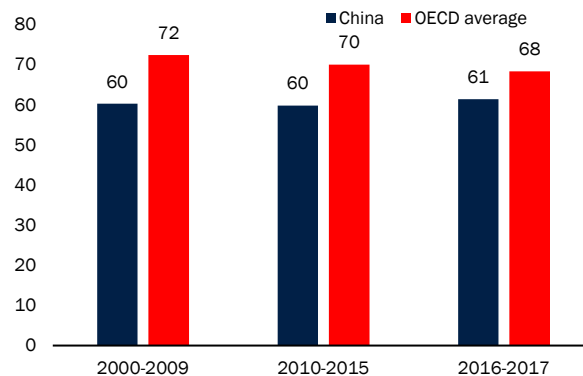
Source: NBS flows of funds data, OECD, World Bank.

Since 2010, the share of household income in national income has started to rise, driven primarily by a significant increase in the wage share in GDP. China's working-age population has started to decline, reducing the supply of labor. The large-scale migration from rural to urban areas has also slowed substantially. Meanwhile, the transition from industry to services has increased the demand for labor, because services are more labor-intensive than industry, particularly heavy industry, which was the dominant driver of growth in the decade ending in 2010 (Huang and Lardy 2016). The combination of reduced supply of labor and rising demand for workers has led to wages increasing faster than GDP since 2010.

By international standards, China's household disposable income as a share of GDP is no longer low. According to the International Labour Organization (ILO), China's labor income share stood at 51.3 percent of GDP in 2017. This was lower than the OECD average of 57.6 percent, but higher than an average of 46.9 percent of GDP for the upper-middle income countries (Figure 53). China's non-labor income (NLI), such as government transfers and investment income, remains relatively small. Nevertheless, China's household disposable income registered 60.7 percent of GDP in 2017. For comparison, household disposable income in the OECD countries averaged 67 percent of GDP in 2017, and is still declining (Figure 54).

The distribution of the national disposable income in China is highly unequal. The labor income data published by the ILO suggests that the richest decile accounted for around 43 percent of all labor income in China, while the poorest decile earned only 0.4 percent in 2017. For comparison, the poorest decile in the UMIC and OECD countries on average earned 1.3 and 1.7 percent of total labor income in 2017, respectively (Figure 55).

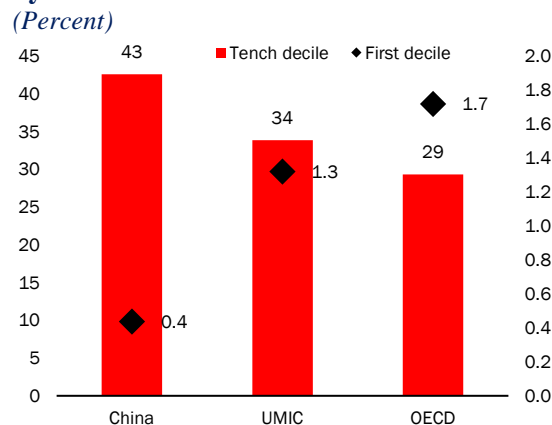**The household savings rate in China is high and continues to increase.**[24] The household savings rate has risen steadily from 9.9 percent of disposable income in 1988 to 29.7 percent in 2018 (Figure 56). This remains one of the world's highest savings rates, exceeding by a wide margin that of Germany, the country with the highest household savings rate among the OECD economies (Figure 57). The rise in the propensity of households to save is mostly driven by urban savings. While urban savings continue to rise, the rural savings rate has gradually declined.

Figure 55: Labor income as share of GDP by income decile
(Percent)

Source: ILO global labour income share and distribution database, World Bank.

Compared to other countries, the household savings rate is higher at every income decile, but the gap is particularly large for the poor. In many countries, savings rates for the bottom 10–20 percentiles are often negative, indicating that substantial social transfers are used to support basic consumption. In China, however, the savings rate for the poor is still positive and quite high (Zhang et al. 2018). Empirical studies suggest that the lack of adequate social safety nets encouraged high precautionary savings in poorer households, in addition to other factors that are driving China's large aggregate saving rate (Box 7).

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[24] There are two approaches to estimating the household gross saving rate in China. One is to use the flow-of-funds accounts data, which is consistent with the national accounts data on an income and expenditure basis. The other is based on urban and rural household survey data. The two data sources measure income and consumption differently, and both have potential sources of bias in the estimated saving rate. For instance, before China produced the first integrated nationwide household survey in 2013, household surveys for rural and urban areas were sampled separately. The urban component of the household survey does not adequately sample migrant workers, even though they make up a considerable share of the urban population. In addition, higher-income households underreport their income and consumption expenditure (Zhao et.al. 2017). The flow-of-funds data has adjusted these factors. However, the share of housing services may be underestimated, because the imputed rent depends on the value of housing, which in urban areas has increased rapidly. All else being equal, understating imputed rents will result in a higher estimated saving rate than if imputed rent were measured correctly (Stratford and Cowling 2016). Further, the consumption of other services may also be underestimated (DRC and World Bank 2014). While there has been a consistent difference in the levels of the two estimated aggregate saving rates over time, both measures suggest that China's household saving rate has been exceptionally high, until most recently.

Figure 56: Household gross savings rate, China
(Percent of household disposable income)

Figure 57: Household gross savings rate, China and the OECD countries
(Percent of household disposable income)
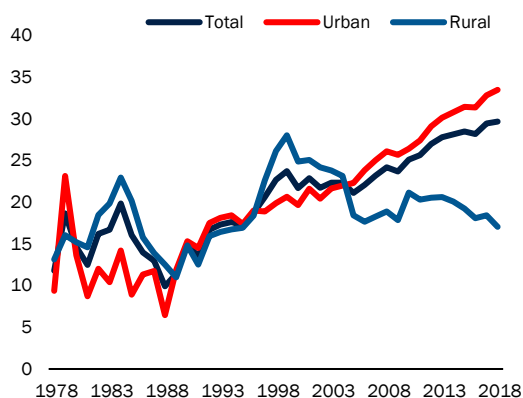
Source: NBS Household Survey, World Bank.
Note: The aggregate household saving rate is defined as 1 - household consumption/disposable income.
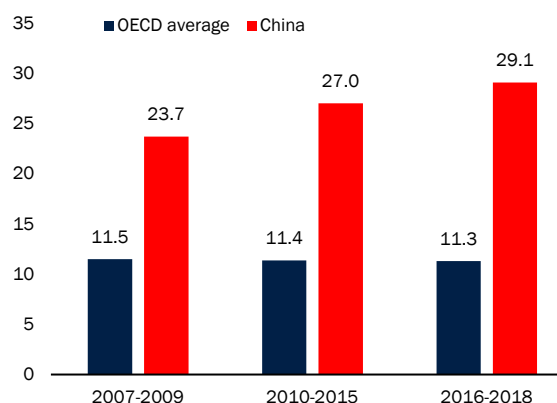
Source: ILO global labour income share and distribution database, World Bank.

Box 7: Drivers of China's large household savings

High savings are driven by a combination of rapid income growth and demographic trends. The significant rise in the household saving rate has coincided with almost four decades of rapid growth—about 10 percent of annual GDP—and a sharp decline in the ratio of young-age population to working-age population (Figure 58). A higher growth rate expands the lifetime wealth of younger cohorts relative to that of older cohorts, which would increase the aggregate saving rate because the young tend to save more as they expect to live longer (Modigliani and Brumberg 1954 and 1980). Two demographic trends have contributed to higher household saving in China: a lower fertility rate and a higher life expectancy. China's fertility rate declined from 2.6 births per woman in the 1980s to 1.6 since the late 1990s. Life expectancy at birth rose from 66 years in 1978 to 76 in 2016. The one-child policy fertility restrictions lowered expected old-age support coming from children—inducing parents to raise saving and education investment in their offspring, creating an incentive to save more for retirement (Choukhmane, Coeurdacier, and Jin. 2018). Recently, the propensity to consume among the younger generations has dramatically increased, due partly to a deepened consumer loan market that gives youth easier access to credit for consumption.

In addition, the lack of adequate social safety nets encouraged high precautionary savings. The 1997 SOE reform, which decreased job security, and the 1997 pension reform, which reduced pension benefits, led to a significant increase in precautionary saving (He et al. 2018; Chamon et al. 2013; Feng et al. 2011; and He et al. 2019). In recent years, significant policy efforts have been made to rebuild the social safety net. However, government social spending remains low by international standards (Figure 59). Consequently, a higher private burden of household expenditures on housing, education, and health care contributed to higher saving rates (Chamon and Prasad 2010). Accelerating rural-urban migration would benefit those lower income earners, and they will consume more. Saving rates of migrant workers are much higher than those of established residents, as much as twice as high in some cities, due partly to the extremely limited social safety net available to them (Yukon Huang 2017).

Figure 58: Demographic changes and the saving rate
(Percent)

Figure 59: Government social spending[25]
(Percent of GDP)
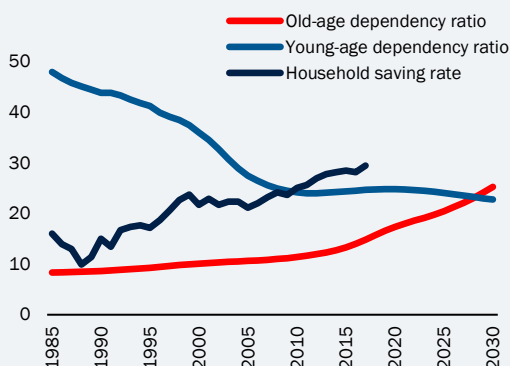
Source: UN Population Division "World Population Prospects: The 2017 Revision," WDI.
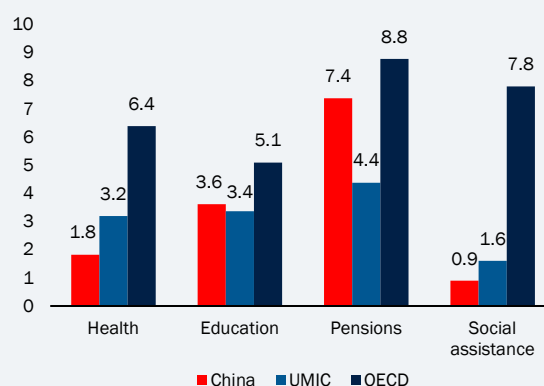
Source: NBS, OECD, ASPIRE, WDI, World Bank.

China's high aggregate household savings rate is also a reflection of high-income inequality in China. There are notable variations in household saving behavior by income level, with strong evidence that the propensity to save increases with household income (Figure 60). This would suggest that the uneven distribution of household income would have also contributed to a higher aggregate savings rate (Stratford and Cowling 2016).

Rising housing prices may affect savings behavior, but empirical evidence suggests this is not a major factor in China. Housing prices can affect savings (and consumption) behavior through various channels. Home ownership can raise the saving rate when liquidity-constrained households save more to make down payments and pay mortgages. On the other hand, rising house prices contribute to homeowners' wealth and can boost consumption, reducing the saving rate. Empirical studies show that housing prices explain only a small portion of the rise in China's saving rate (Chao et al. 2011; Chen et al. 2016; Wang and Wen 2011; Zhang et al. 2018). Over time, the positive relationship between home ownership and saving disappeared, with homeowners saving slightly less than renters by 2013 (Zhang et al. 2018).

Figure 60: Household gross savings rate, by income level of households
(Percent of household disposable income)
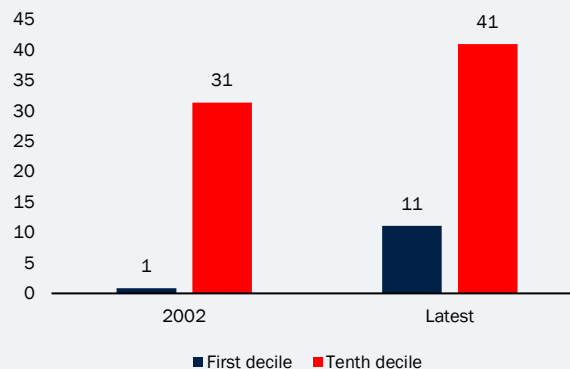
Source: NBS Household Survey, World Bank.
Note: The latest year is 2012.

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[25] OCED data is for 2017 from Government at a Glance 2019. For UMICs, government health and educational expenditures are for 2016 from WDI; social assistance data is from ASPIRE; pension data is from World Bank Pension Expenditure Database 2019. For China, health government spending for 2018 and educational government spending for 2017 are from China Statistical Yearbook 2019; social security fund expense data for 2018 is from Ministry of Human Resources and Social Security; social assistance data is for 2017 covering *Dibao* in rural and urban areas, medical assistance, natural disaster relief, social housing assistance and employment assistance.

Policy Considerations

Given the variation in savings and consumption behavior, increasing the income of poorer households would boost aggregate consumption. Redistributive fiscal (tax and transfer) policy is one of the main instruments to reduce income inequality, but it may be relatively underused in China.[26] There is a scope for redefining and modernizing the social assistance system, shifting from area-based approaches to targeting households in need of assistance, to improving the targeting and effectiveness of the system. This will require developing a more systematic approach to the determination of "*Dibao*" (minimum living standard guarantee program) eligibility t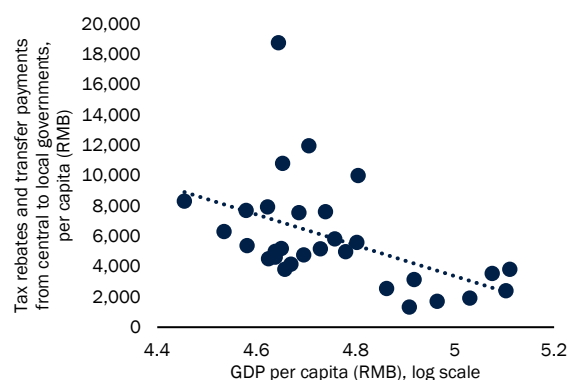hresholds and benefit levels (DRC and World Bank 2019). A more progressive income tax system should be developed, given the reliance on VAT revenues and flat individual social contribution rates, both of which fall disproportionately on the poor (Lam and Wingender 2015).

Higher and more effective social spending is necessary to reduce precautionary saving and increase household consumption for poorer households. Several government policies could be introduced to support consumption-led growth, including a restructuring of government budgets, pension system reform, and improvements in health care.

- **To stimulate consumption growth, the government has significant room to shift fiscal resources toward social spending.** China's health, education, and social assistance spending, at 1.8, 3.6, and 0.9 percent of GDP in 2017, respectively, are below average compared with the upper middle-income countries (UMICs) and OECD (Figure 59). China's demographic challenge alone will require a major shift in government spending, but dividends can also be reaped through the effect of these measures on stimulating consumption growth.

- **Given that China still faces disparities in the provision of public services across provinces and between rural and urban areas, the central government could increase equalization transfers to less wealthy regions.** Redistribution through intergovernmental transfers is progressive, with provinces that have lower GDP per capita getting higher per capita transfers (Figure 61). Nevertheless, the transfers do not fully compensate for regional inequality. Public spending on health and education per capita is higher in richer provinces. While most Eastern provinces are ranked in the top 20 percent globally on the Healthcare Access and Quality index, all Western and Central provinces are in the bottom 50 percent. With respect to education, the number of students per teacher has steadily declined, but the ratio remains lower in wealthier provinces (World Bank 2018c).

Figure 61: Fiscal transfer by province
(RMB)

Source: Ministry of Finance of China, World Bank.
Note: Tibet is excluded

- **Pension system reform could reduce precautionary saving, facilitate labor migration to areas with higher productivity, and possibly reduce the high burden of social taxes on the cost of**

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[26] One measure of the redistributive effect of fiscal policy is a comparison of the market Gini coefficient (estimated using pre-tax, pre-transfer market incomes) and the net Gini coefficient (calculated from household post-tax, post-transfer disposable incomes). The existing academic research finds evidence that China's average estimated redistribution (i.e., the difference between the market and the net Gini coefficient) is relatively low compared to other developing counties, which indicates that the redistributive effect of fiscal (tax and transfer) policy is comparatively modest in China (Cevik and Correa-Caro 2015; Xu, Ma, and Li 2013).

doing business. China needs a unified national pension system. Pension coverage, at 86 percent of the labor force in 2018, is relatively high for a country at China's income level. But the benefits for some categories of retirees, such as rural residents and informal sector workers, are only a fraction of the poverty line and can be raised. Despite recent government efforts, most pension rights still cannot be transferred between provinces and across cities. In addition, rapid aging and the decentralized nature of the pension system are a challenge to financial sustainability. A central adjustment fund was created to pool funds from the provinces and redistribute them between regions, but this is only a partial substitute for national pooling. The government also announced the transfer of 10 percent of SOE equity into the social security funds. Policy makers could also consider allocating SOE dividends and new capital (by issuing government bonds) to the social security fund. Additional measures include a gradual increase in the retirement age, which would be the same for men and women; a uniform framework for automatic pension indexation; a longer reference period of wages used in determining the basic benefit; and a framework for the automatic adjustments in annuity factors, given growing life expectancy at retirement age (World Bank 2017).

- **A more robust health insurance system would help protect the poor from high health care costs.** Despite near-universal health insurance coverage, out-of-pocket spending by the poor and rural populations remains relatively high and increases the likelihood of families becoming poor because of health care costs (Zhang and Liu 2014; Long et al. 2013; and Feng, Lou, and Yu 2015). A recent policy commits to reimbursing medical expenditures that are deemed catastrophic, defined as exceeding a specific threshold of the household's disposable income. However, this is a stopgap measure, and structural changes are needed to address the root causes of the problem. The government has also set up elder care subsidy systems in 20 provinces for the elderly with economic difficulties, including Destitute Support programs for the poorest elderly people, but these programs have limited coverage.[27]

Deepening market reforms and lifting distortionary restrictions (e.g., restrictions on market entry, especially in services, and hukou) are critical to stimulating consumption of both the poor and the rising middle class. Land reforms would give peasants the wealth from land sales, mitigating growing wealth inequality and increasing consumption through the wealth effect. In addition, *hukou* reform will be a top priority, as the inability to provide migrants with social entitlements on par with urban residents not only increases inequality but also discourages consumption. China's middle class is rapidly expanding, with a growing share of private consumption expenditures directed to durables and services. Continuing to remove barriers to cross-border trade and investment and further opening service sectors, such as financial, health, education, and telecommunications, would help serve the increasingly sophisticated needs of the consumers who demand higher standards of goods and services for better convenience, quality, and variety (World Economic Forum 2018).

IV. Special Feature: To Bluer Skies

Staying the Course on Air Quality Management

China's exceptionally fast growth has exacted a heavy toll on its environment, including high levels of air pollution. The 2018 global environment performance index still ranks China at 120th out of 180 countries (Figure 62). Being the second largest economy and largest manufacturer in the world, China is also the world's largest greenhouse gas emitter, accounting for about 28.3 percent of global greenhouse gas emissions in 2017. Poor urban planning and uncoordinated infrastructure investments have led to urban

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[27] In 2011 only 5 million elderly were covered. While this number has likely increased since then, no more recent estimates are available.

pollution, congestion, and a high cost for many municipal services. Average ambient exposure to concentrations of 2.5 micrograms of particulate matter (PM2.5) per cubic meter in China have dramatically declined in recent years but remained high by international standards (Figure 63). In 2017, average PM2.5 concentrations in Beijing exceeded World Health Organization (WHO) air quality guidelines by nearly six-fold, and by almost fourfold in Shanghai. In the 338 cities for which monitoring data is available, average PM2.5 concentrations amounted to 4.3 times the WHO guideline. Water and soil contamination are also important threats to health and the environment.
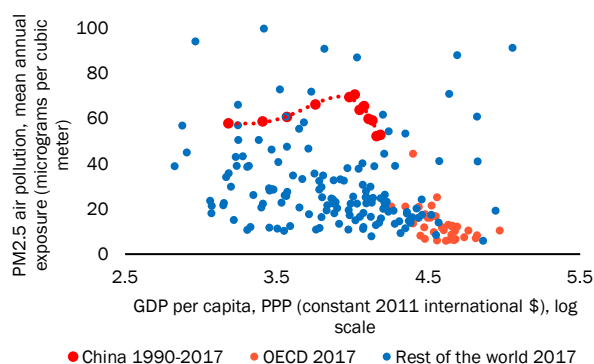
Figure 62: The 2018 environmental performance index (EPI)
Score 0-100 (higher = better)

Figure 63: PM2.5 air pollution
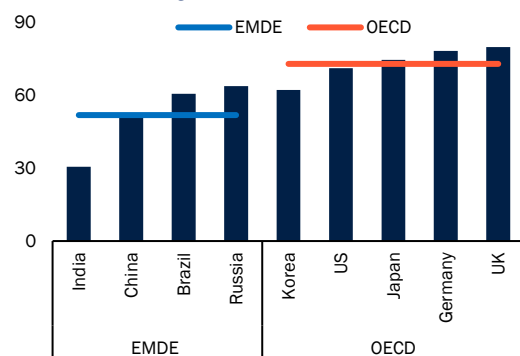
Source: The 2018 Environmental Performance Index (EPI), Yale University.

Source: WDI, World Bank.

Since 2012, China has made great strides in addressing these environmental challenges, including improving air quality in major urban areas. The 12th and 13th five-year plans, covering 2011 to 2020, have marked a transformative period for air quality management (AQM) in China. The success achieved since the launch of the *National Action Plan for Air Pollution Prevention and Control* (*APPCAP*) in 2013 is evident in the declining severity of pollution in many of China's cities. According to the Ministry of Ecology and Environment (MEE), average annual concentrations of PM2.5, tiny particulates with a diameter of less than 2.5 microns, or about one-thirtieth the width of a human hair—dropped by 42 percent in the densely-populated regions targeted by the *APPCAP* (MEE, 2019). Analysis by the World Bank shows that there was only **one** day in the three-year period from 2013 to 2015 when average 24-hour PM2.5 for the 74 cities in the *APPCAP*-identified priority areas met the guideline value set by the WHO, but there were 47 days in 2018 (Figure 64). Meanwhile, the share of the population living in cities in which mean annual PM2.5 met China's national standards rose to around 21 percent in 2018, up from less than 3 percent in 2013, as millions more people now live in areas where air quality is within acceptable legal limits.

Figure 64: Average daily PM2.5 in China's key cities, January 2013 to May 2019[28]

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[28] *Notes*: Data are for 69 of the 74 cities in the priority regions identified in the APPCAP for which complete data for January 2013 to May 2019 are available; "China I" and "China II" indicate China's national Grade I and Grade II ambient air quality standards; "WHO IT-2" and "WHO IT-3" indicate the interim targets set by the WHO for 24-hour PM2.5; average 24-hour PM2.5 concentrations for the 69 cities are weighted by city population; for 2018 and 2019, the city population in 2017 is assumed because population data for the most recent years are not yet available; raw hourly monitoring station data are screened for quality following (Silver et al. 2018).

Source: Ambient PM2.5 monitoring data from China National Environmental Monitoring Center, MEE (http://106.37.208.233:20035) as provided by Qingyue Open Environmental Data Center (https://data.epmap.org), http://beijingair.sinaapp.com, and Zhen Qi Wang (https://www.aqistudy.cn); city population data from Ministry of Housing and Urban-Rural Development, http://www.mohurd.gov.cn/xytj/tjzljsxytjgb/.

This success is owed to several factors. Better data on air quality and emissions, greater public disclosure, and a closer integration of science into policy have solidified the foundation for more effective control of air pollution. Stronger, more consistent enforcement of standards, marked by a series of aggressive inspection campaigns and a recentralization of authority at the provincial level, have demonstrated increasing political commitment. Increased financial resources for AQM helped translate policy into action, while the growth of China's green financial system has opened new avenues for investment and support.

Still, much remains to be done, and the challenges facing policymakers and regulators are only growing more complex. Most of the country's population is still exposed to unhealthy levels of air pollution, and some forms of pollution are worsening, including surface-level ozone (O_3), which aggravates conditions such as asthma and can cause permanent damage to the lungs. Furthermore, as cities have already picked many of the "low-hanging fruits" and eliminated the largest direct sources of PM2.5 emissions in downtown areas, the share of PM2.5 blown in from surrounding areas or formed through

secondary chemical reactions involving other pollutants has grown. [29] These pollutants can remain suspended in the atmosphere and travel long distances. Continuing to improve air quality will mean placing a greater premium on developing multi-pollutant control strategies and coordinating across jurisdictions.

Policy Considerations

Policies would need to target multiple objectives; aim to expand access to new forms of financing for AQM for local governments and businesses; introduce cost effectiveness-based AQM planning to ensure that public and private resources are used wisely; and solidify the institutional and legal basis for greater use of market-based policy instruments. Maintaining progress over the longer term and realizing the country's goal of meeting China II standards for air quality in all cities by 2030 will require new sources of financing and new approaches to planning and enforcement. If done right, making greater use of market-based policy instruments will reduce the administrative burden of government and pave the way for bluer skies.

Expand access to AQM financing through China's green finance system

**Resources for AQM have increased dramatically under the *APPCAP* and *Blue Skies Plan.* ** Annual capital investments by public entities in air pollution prevention and control rose from RMB 9.1 billion in 2000 to RMB 44.6 billion in 2017.[30] The central government contributed RMB 52.8 billion to its special-purpose fund for activities under the *APPCAP* from 2013 to 2017,[31] and another RMB 45 billion to its fund for activities under the *Blue Skies Plan* in 2018 and 2019.[32] Separate funds have also been created to support industrial restructuring and upgrading (i.e., plant closures, retrofits, and the installation of emissions controls), and to provide subsidies for such measures as replacing coal-based household heating. Hebei, for example, allocated RMB 6 billion to special-purpose funds to support key industries.[33] From 2016 to 2018, the central government allocated RMB 27.6 billion for gas and electric heating subsidies to households.[34]

Demand for investment will continue to grow. The Bluetech Clean Air Alliance projects estimated that if air quality in all the country's cities can reach acceptable standards by 2030, then the market for clean air technologies—including clean energy vehicles, industrial pollution control, coal-free heating, emissions

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[29] Beijing is a good example. Regional sources make up about one-third of the city's PM2.5 pollution. On days with severe pollution, the share from regional sources is usually one-half to three-quarters of total PM2.5 (Innovation Center for Clean-Air Solutions 2018).

[30] All RMB amounts for earlier years have been adjusted to year 2017 prices at market rates. Investment amounts reported by MEE are aggregated from the different line ministries and primarily include public spending on the treatment of industrial pollution and urban infrastructure. Of the two, urban infrastructure probably accounts for the majority (Zhang 2016).

[31] Central Government of the People's Republic of China (中华人民共和国中央人民政府), "Environmental Protection Bureau Press Conference on Progress with Prevention and Control of Atmospheric Pollution and Other Issues" (环境保护部就大气污染防治工作进展情况等答问), Feb. 27, 2018, http://www.gov.cn/xinwen/2018-02/27/content_5269486.htm.

[32] Xinhua, "Ministry of Environmental Protection: Atmospheric Emissions Still High, Path Ahead for Pollution Prevention and Control Still Long and Arduous" (生态环境部：大气污染物排放仍处高位 防治任重道远), Jan. 21, 2019, http://www.xinhuanet.com/politics/2019-01/21/c_1210043398.htm; Xinhua, "Central Financing of RMB 60 billion Approved for Pollution Prevention and Control Special-Purpose Fund in 2019, Increase of 25%" (2019 年中央财政将安排污染防治资金 600 亿元 增长 25%), reposted on China Energy Network (5e, 中国能源网), March 8, 2019, https://www.china5e.com/news/news-1053193-1.html.

[33] Wong and Karplus, 2017, "China's War on Air Pollution: Can Existing Governance Structures Support New Ambitions." *The China Quarterly* 231: 662-684.

[34] Dong et al, 2019. "Annual Report on Environmental Economics and Policies 2018" (环境经济政策年度报告 2018). *China Journal of Environmental Management* (中国环境管理) 247: 24-39.

and air quality monitoring, and higher quality fuels for road transport—will be on the order of RMB 20 trillion.[35] Public spending alone will be simply unable to meet this demand.

New sources of financing for AQM can be unlocked by tapping into China's burgeoning system of green finance. China has emerged as the world's largest market for green bonds, with RMB 210.3 billion ($31.2 billion) in offerings in 2018.[36] The growth of this market has already spurred new investment in AQM programs. For example, in February 2017, the China Development Bank (CDB) issued the first bank-issued bond in China specifically for air pollution prevention and control.[37] The RMB 5 billion bond provides financing for projects in energy efficiency, clean transport, and clean energy, including subsidies for rural households outside Tianjin to replace their coal-burning stoves with electric boilers. The projected emissions savings and environmental benefits were verified by an independent auditor, and the bond was certified under (PBOC) green bond standards prior to issuance.[38]

At the national level, public policy should concentrate on firming up the technical, legal, and institutional infrastructure underlying the green financial system, and identifying ways to reduce the transaction costs and risks associated with financing AQM. Promoting the use of guarantee instruments is one way of reducing risk. Numerous countries and international financial institutions have established guarantees for renewable energy, energy efficiency, and other projects that deliver AQ benefits.[39] China's national guarantee fund, which began operations in September 2018, is still in its infancy, but has already amassed RMB 60 billion and provided RMB 32.6 billion in reinsurance services to over 25,000 SMEs through provincial guarantee funds and commercial banks in its first months.[40] Alongside existing funds, the establishment of a targeted guarantee fund for AQM and other green projects could provide more tailored services for these still underserviced sectors.[41] Another way to reduce transaction costs for financing AQM projects is to adjust the risk weightings on green loans to lower capital requirements for banks, as has been suggested by Ma Jun, member of the PBOC Monetary Policy Committee and chairman of China's Green Finance Committee.

At the local level, governments will need to work together to develop financing plans for AQM and facilitate access to technical and financial advisory services. Coordinated AQM investment programs developed across cities and counties within an airshed can help increase liquidity and diversify risk (PwC et al. 2019). Often, such investment programs will draw from a combination of sources, including government bonds, general budgetary funds, fiscal transfers, grants, and loans. They may also provide additional guarantees to alleviate investor risk, as has been the case for many U.S. cities (see Smart Cities Council 2013). One way of structuring such a blended program is through the creation of an investment fund specifically designed to support measures contained within local governments' AQM plans. Denmark's Green Investment Fund is a good example of such a fund. It committed €1.9 billion in public funds for green infrastructure and garnered €7.3 billion in private sector financing (EC 2016). In China,

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[35] BCAA, 2018, *2030 China Clean Air Market Outlook,* https://www.climatebonds.net/resources/reports/china-green-bond-market-2018

[36] Only green bonds that are aligned with international standards are included (CBI 2019).

[37] China Development Bank (国家开发银行), "CDB Issues First Green Bond for Air Pollution Prevention and Control" (国开行推出首单大气污染防治专题绿色债券), Feb. 14, 2017, http://www.cdb.com.cn/xwzx/khdt/201702/t20170214_4082.html

[38] It deserves mentioning that commercial financing in China has supported innumerable other projects that have delivered air quality co-benefits, although not explicitly for AQM. Sohu, "Agricultural Bank of China Observer – Green Bonds Deliver More than Just Clean Air" (农银观察，绿色债券带来的绝非仅是好空气), Feb. 27, 2017, https://m.sohu.com/n/481810578/?wscrid=95360_1.

[39] Fang, 2016, "Innovations and Experience with Green Lending by Commercial Banks and Related Policy Recommendations" (商业银行绿色信贷创新实践与相关政策建议). *Financial Regulation Research* (金融监管研究) 6: 57-72.

[40] MOF, "Ministry of Finance: National Investment Guarantee Fund Services Begins to See Results Since Entering Operation" (财政部：国家融资担保基金业务运行成效初显), Central Government of People's Republic of China, Feb. 17, 2019, http://www.gov.cn/xinwen/2019-02/17/content_5366357.htm.

[41] An Guojun, 2018, Special Characteristics and Trends in the Development of China's Green Funds.

regional AQM investment funds might be capitalized with initial investment from the earmarked air quality budget, and, in part, with revenues from the new environmental tax, concessional loans, or via the provincial eco-development funds managed by the regional AQM planning bodies. Local governments may also explore how to use China's rapidly growing green bond market by developing comprehensive AQM plans, creating a framework for how green bonds will be used to finance these plans, and then certifying the framework, whether under the PBOC's green bond standard or other internationally recognized protocol.

Strong transparency and certification, as well as monitoring, reporting, and verification (MRV) requirements will be essential to attracting financing for AQM plans on the capital markets. China's market for green bonds is already moving in a promising direction on this front, emerging as one of "the most rigorous in the world," according to the Climate Bonds Initiative.[42] About 86 percent of green bonds issued in China in 2018 underwent at least one external review prior to issuance, and 85 percent of green bond issues in China have publicly available post-issuance reporting on how bond proceeds have been used (the highest share of any country). All verifiers must undergo a thorough registration process with China's Green Bonds Standard Committee, and nearly three-quarters are already licensed under the international Climate Bonds Standard and Certification Scheme (CBI 2019). By contrast, the existing special-purpose government funds for AQM in China are relatively opaque. Administrative rules require the provinces and the cities below them to publicly report how the amounts disbursed from the central fund are allocated, and call for evaluations of results.[43] However, no specific technical guidance or standards exist for the protocols, methods, form, or content of public disclosure; MRV; or the auditing of special funds for AQM and environmental protection (Huang 2018; Yang 2018). If these special-purpose funds convert into larger investment programs, blending public funds and private capital, the demand for information will be much greater. The general requirements for disclosure and MRV related to AQM will need to be operationalized in line with the precedent set by China's green bond market.

Increase resource use efficiency by introducing cost effectiveness based AQM planning

Policies should also aim to ensure that public and private resources are used in the most cost-effective manner. In recent years, AQM planning in China has shifted from an early emphasis on cutting total emissions in individual entities or administrative areas to a more sophisticated prioritization of emissions cuts, needed to deliver improvements in AQ at the airshed scale.[44] The next phase of AQM planning should aim to identify the most efficient package of abatement policies and measures needed to achieve targets at the least cost to the economy.

Numerous analytic tools and methods have been developed to identify and prioritize abatement measures for AQM. Some tools seek to optimize the mix of actions needed to achieve a desired result, such as meeting legally acceptable standards for AQ at the lowest cost. An example of such a **cost-effectiveness** tool is the Greenhouse Gas – Air Pollution Interactions and Synergies (GAINS) model, developed by the Vienna-based International Institute for Applied Systems Analysis.[45] GAINS helps identify the most cost-effective package of abatement measures for a variety of pollutants (including greenhouse gases and local air pollutants) and sectors within a given region. GAINS has been used

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[42] Sean Kidney, "Myth buster: why China's green bond market is more orderly than you might think. An Overview from Climate Bonds Initiative," June 21, 2017, https://www.climatebonds.net/2017/06/myth-buster-why-china%E2%80%99s-green-bond-market-more-orderly-you-might-think-overview-climate
[43] See article 11 and 12 of MOF and MEE (2018).
[44] See United Nations Environment Programme UNEP (2016) and Narain et al. (in press) for a discussion of this evolution in the Jing-Jin-Ji region.
[45] See IIASA, "The GAINS Model," http://www.iiasa.ac.at/web/home/research/researchPrograms/air/GAINS.html.

extensively in policymaking settings in Europe starting in the 1990s, providing the analytic basis for various EU countries' commitments.[46] Versions of GAINS have also been developed for India and China.[47]

The World Bank's Pollution Management and Environmental Health Program and IIASA are currently supporting the MEE's Chinese Research Academy of Environmental Sciences and the provincial academies in developing a GAINS model tailored for the Jing-Jin-Ji region, which will support development of AQM plans by identifying cost-effective measures at the sub-provincial level. The Hebei government will be the first in the region to apply the Jing-Jin-Ji version of GAINS in evaluating its *Blue Skies Plan* provincial strategy and identifying priority actions for the 14th five-year plan. Such an effort will be the first application of cost-effectiveness-based AQM planning by a local government in China.

With GAINS or other tools for AQM analysis, the process of sharing, deliberating, and reaching consensus on the findings with stakeholders will be as important as the findings themselves. In Europe, for example, updating the EU's clean air policy package entailed a multi-year process involving member countries, industries, scientists, NGOs, and international stakeholders. Throughout this process, GAINS provided a common framework for conducting the impact assessment of new proposals and national commitments as they were negotiated by European institutions and the member states. In China, as the science, policy, and economic conditions continue to evolve, targets should be reviewed regularly to ensure relevance and consistency with the country's longer-term policy goals for AQ and climate.

Solidify the institutional and legal basis for market-based policy instruments

Strong, consistent enforcement of environmental norms and standards will be fundamental for two reasons; first, for making China's green finance system work and second, for translating AQM plans into visible improvements in air quality. With weak enforcement, the risks associated with pollution-intensive production activities are reduced, and incentives to invest in pollution control disappear. Only with stronger enforcement can public agencies help tip the balance in favor of investments in emission-reducing activities.

In recent years, the central government strengthened enforcement by elevating the political priority of AQM and putting greater pressure on local authorities to make improvements. In 2014, the State Council introduced new rules that made the achievement of air quality targets an integral part of annual performance reviews for government officials. In 2015, the government also launched a series of centrally organized environmental inspection campaigns to monitor progress and compliance in the provinces.[48] The scale and force of these campaigns has been unprecedented, with more than 18,199 government officials disciplined, complaints filed against 29,000 enterprises, RMB 2.46 billion in fines issued, and 2,264 people arrested or detained.[49] The provinces have organized parallel campaigns to inspect lower-level governments and businesses. Henan, for instance, dispatched more than 21,000 people for a massive campaign in 2017 (BCAA, 2018b). These top-down, target-driven accountability systems, and the massive inspection campaigns have delivered results, but they have come at a huge administrative cost and may be difficult to sustain over the longer term.

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[46] The commitments were negotiated under the Convention on Long-Range Transboundary Air Pollution, Gothenburg Protocol, and EU National Emission Ceilings Directive, EU Thematic Strategy on Air Pollution, and EU Climate and Energy Strategy for 2030. See IIASA, "GAINS-Europe," http://www.iiasa.ac.at/web/home/research/researchPrograms/air/Europe.html

[47] See IIASA, "GAINS-Asia," http://www.iiasa.ac.at/web/home/research/researchPrograms/air/Asia.html

[48] The inspection campaigns are an *ad hoc* environmental enforcement mechanism that first appeared in 2006. The mechanism was consolidated under new rules issued in 2015.

[49] BCAA, 2018; Xinhua net, "Feedback on First Central Environmental Protection Campaign – 31 Provinces Have Some Common Problems" (首轮中央环保督察情况全反馈 31 省份有这些通病), Jan. 4, 2018, http://www.xinhuanet.com/politics/2018-01/04/c_1122206360.htm; and Xinhua net, "`Numbers Speak for Themselves' – Look Back at First Central Ecological Environmental Inspection: 150,000+ Environmental Problems, RMB 2.46 Billion in Fines, 2,264 People Detained" ("数说"第一轮中央生态环保督察及"回头看"：15 万余件环境问题、24.6 亿元罚款、2264 人被拘留), May 15, 2019, http://www.gov.cn/hudong/2019-05/15/content_5391977.htm; and CAAC (2018).

To ease the burden of implementation, the central government should bolster the use of market-based policy instruments for AQM. Priorities for further experimentation and reform include the pollutant discharge permit system and the environmental tax system.

The pollutant discharge permit system intends to control and cap total emissions of pollutants through a tracking and reporting system. The State Council issued an opinion in 2014 laying out guiding principles and encouraging the establishment of tradable emissions permits in pilot provinces (State Council 2014a). In addition to the 12 pilot provinces backed by the central government, 16 others and many city governments have forged ahead and established their own platforms for emissions permit trading.[50] There has been little active trading on the platforms to date, but the lack of progress has demonstrated that the viability of these systems will hang on the legal strength and costs of violations. The immediate priority is to strengthen enforcement and implementation of the *Updated Management Guideline for Pollutant Discharge Permit*, which was published in 2016 and updated in 2018 by MEE to clarify roles and responsibilities and to address unification of standards.

For the environmental tax, the central government should provide more uniform guidance to the provinces in establishing tax rates. In principle, tax rates should at least in part reflect the social and environmental costs of emissions in a given jurisdiction. For example, emissions affecting large population centers or ecologically sensitive areas, such as protected areas, should be taxed at a higher rate, as should the emissions of pollutants that are especially harmful to human health and natural ecosystems. The current tax rates set by the provinces do not reflect the dynamics of these costs. MEE and the China Ministry of Finance might consider introducing a requirement for a scientific review process in the provinces, such as establishing a clearer justification for the provinces' chosen schedule of taxes on air emissions. This review process should be open and consultative, allowing representatives from industries, research institutes, environmental groups, and other public entities to participate. Higher tax rates in provinces and prefectures targeted for deeper cuts in emissions (i.e., those identified through cost-effectiveness-based AQM planning and analysis) may be offset through fiscal transfers and the use of eco-compensation funds. A more transparent, structured process for setting and adjusting tax rates will engender greater confidence in the markets among investors who are weighing the potential financial returns on pollution-reducing projects. It will also help ease enforcement of the tax. A revenue recycling mechanism to allow enterprises to tap into the fund collected for upgrading environmental performance would provide resources to incentivize business investment and actions.

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[50] Ministry of Finance, China, 2019. "Initial Results of Pilots for Paid Use and Trading of Emissions" (排污权有偿使用和交易试点工作取得阶段性成效), Jan. 23, 2019, http://www.gov.cn/xinwen/2019-01/24/content_5360745.htm

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