



ASIAN DEVELOPMENT OUTLOOK 2020

WHAT DRIVES INNOVATION IN ASIA?

Special Topic: The Impact of the Coronavirus Outbreak—An Update

APRIL 2020

HIGHLIGHTS

ASIAN DEVELOPMENT OUTLOOK 2020

WHAT DRIVES INNOVATION IN ASIA?

Special Topic: The Impact of the Coronavirus Outbreak—An Update

APRIL 2020

HIGHLIGHTS



Creative Commons Attribution 3.0 IGO license (CC BY 3.0 IGO)

© 2020 Asian Development Bank
6 ADB Avenue, Mandaluyong City, 1550 Metro Manila, Philippines
Tel +63 2 8632 4444; Fax +63 2 8636 2444
www.adb.org

Some rights reserved. Published in 2020.

Publication Stock No. FLS200120-3
<http://dx.doi.org/10.22617/FLS200120-3>

The views expressed in this publication are those of the authors and do not necessarily reflect the views and policies of the Asian Development Bank (ADB) or its Board of Governors or the governments they represent.

ADB does not guarantee the accuracy of the data included in this publication and accepts no responsibility for any consequence of their use. The mention of specific companies or products of manufacturers does not imply that they are endorsed or recommended by ADB in preference to others of a similar nature that are not mentioned.

By making any designation of or reference to a particular territory or geographic area, or by using the term “country” in this document, ADB does not intend to make any judgments as to the legal or other status of any territory or area.

This work is available under the Creative Commons Attribution 3.0 IGO license (CC BY 3.0 IGO) <https://creativecommons.org/licenses/by/3.0/igo/>. By using the content of this publication, you agree to be bound by the terms of this license. For attribution, translations, adaptations, and permissions, please read the provisions and terms of use at <https://www.adb.org/terms-use#openaccess>.

This CC license does not apply to non-ADB copyright materials in this publication. If the material is attributed to another source, please contact the copyright owner or publisher of that source for permission to reproduce it. ADB cannot be held liable for any claims that arise as a result of your use of the material.

Please contact pubsmarketing@adb.org if you have questions or comments with respect to content, or if you wish to obtain copyright permission for your intended use that does not fall within these terms, or for permission to use the ADB logo.

Corrigenda to ADB publications may be found at <http://www.adb.org/publications/corrigenda>.

Notes:

In this publication, “\$” refers to US dollars.

ADB recognizes “Hong Kong” as Hong Kong, China; “China” as the People’s Republic of China; “Korea” and “South Korea” as the Republic of Korea; and “Vietnam” as Viet Nam.

Cover design by Anthony Victoria.

Cover artwork by Atsuko Yamagata/2020.

ADO 2020—Highlights

After a disappointing 2019, growth in the region is expected to slow sharply to 2.2% in 2020 under the effects of the current health emergency and then rebound to 6.2% in 2021. Excluding Asia's high-income newly industrialized economies, growth will drop from 5.7% to 2.4% this year before recovering to 6.7% next year.

Headline inflation accelerated in 2019 as food prices edged up but remained low by historical standards. Inflation will climb further to 3.2% in 2020, but declining food prices in the latter half of the year will set the stage for easing inflation in 2021.

Downside risks to the outlook are severe, most notably from coronavirus disease 2019 (COVID-19). No one can say how widely the COVID-19 pandemic may spread, and containment may take longer than currently projected. The possibility of severe financial turmoil and financial crises cannot be discounted. Sharp and protracted declines in commodity prices and tourist arrivals will challenge dependent economies across the region.

In these difficult times, when challenges to growth abound, innovation is critical to inclusive and environmentally sustainable growth. While some economies in developing Asia are near or at the global innovation frontier, many others lag behind. The theme chapter in this report identifies five key drivers of innovation that should inform policy: sound education systems, innovative entrepreneurship, conducive institutions, deeper capital markets, and dynamic cities that bring together top universities and forward-thinking firms. Asian countries must first get the basics right because there are no shortcuts to an innovation society. For example, strikingly, one in three 10-year-old Asians cannot read adequately. This suggests that the education systems of lagging countries must be strengthened and reformed. The journey toward a more innovative Asia thus requires long-term commitment and a lot of hard work.



Yasuyuki Sawada
Chief Economist
Asian Development Bank

Asia reels from the COVID-19 outbreak

After a difficult 2019, challenges mount

- **Following a lackluster 2019, an incipient recovery is upended by COVID-19.** Growth in developing Asia slowed to 5.2% in 2019 from 5.9% in 2018, handicapped by trade tensions, a downturn in electronics, and weak domestic investment. Just as recovery in the electronics sector and progress toward what would become the “phase one trade agreement” between the United States and the People’s Republic of China (PRC) began to lift the region’s prospects in late 2019, the momentum was halted by the outbreak of Coronavirus Disease 2019 (COVID-19). The outbreak emerged in January 2020, severely affecting the PRC and rapidly spreading across the world. The evolution of the outbreak, and hence this outlook, remain highly uncertain, but the baseline forecast is that regional growth will slow steeply to 2.2% in 2020 before recovering to 6.2% in 2021. Excluding the newly industrialized economies, growth is seen to slow from 5.7% in 2019 to 2.4% in 2020 and then to pick up to 6.7% in 2021.
- **The external environment is worsening as the outbreak spreads.** Growth in the major industrial economies of the US, the euro area, and Japan had already decelerated from 2.2% in 2018 to 1.7% in 2019. Signs of revival emerged in November 2019 as global trade and manufacturing trended upward for the first time in several months. But, with the COVID-19 outbreak increasingly overwhelming Europe and the US, economic activity in those economies is expected to fall sharply as they undertake containment. Growth in the major industrial economies is expected to contract by 0.3% in 2020 before recovering to 1.8% in 2021.
- **Growth will fall substantially in the PRC this year.** In 2019, US–PRC trade tensions weighed on both exports and domestic demand in the PRC. GDP growth slowed from 6.7% in 2018 to 6.1% in 2019. The shock from the COVID-19 outbreak this year is much greater. Data for the first two months of the year indicate double-digit contractions in industry, services, retail sales, and investment. As a result, growth in the PRC is forecast to slow to 2.3% in 2020 before rebounding to 7.3% in 2021.
- **Growth in India will remain subdued after a disappointing 2019.** India suffered a sharp slowdown last year, from 6.1% in fiscal 2018 to 5.0%, as a credit crunch that originated in the nonbanking financial sector severely hampered bank lending. COVID-19 has not yet spread extensively in India, but measures to contain the virus and a weaker global environment will whip up headwinds, offsetting support from corporate and personal income tax cuts as well as financial sector reforms which are meant to revive credit flows. GDP growth in India is forecast to slow further to 4.0% this year before strengthening to 6.2% in fiscal 2021.

- **All of developing Asia's subregions will see growth weaken in 2020.** Global demand weakened by the pandemic will weigh on the 2020 outlook, particularly in the more open subregions and tourism-dependent economies like those in the Pacific. Growth in East Asia will dip from 5.4% in 2019 to 2.0% in 2020 before reaccelerating to 6.5% in 2021. As the larger Southeast Asian economies wrestle with COVID-19, growth in the subregion is forecast to drop to 1.0% in 2020 before recovering to 4.7% in 2021. Growth in Central Asia will also slow to 2.8% this year with lower oil prices, and the Pacific will contract by 0.3% with declining tourism, before rebounding in 2021. South Asia's growth rate is forecast to slow from 5.1% in fiscal 2019 to 4.1% in fiscal 2020 and reaccelerate to 6.0% in fiscal 2021, largely tracking recovery in India. Across Asia and the Pacific, the authorities have introduced stimulus packages to support economic activity.
- **Inflation will tick up on increased food prices before easing in 2021.** Regional inflation increased from 2.5% in 2018 to 2.9% in 2019, driven mainly by rising food prices, particularly pork prices in the PRC and vegetable prices in India. However, inflation has remained under control, below the 3.3% average in the past 10 years, which has allowed many central banks across developing Asia to cut policy rates to stimulate growth. Regional inflation is projected to increase to 3.2% in 2020, driven by pork prices in the PRC, before easing again to 2.3% in 2021. Weakening economic activity and softening commodity prices will partly offset the effect of food prices.
- **A widening current account surplus in 2019 and 2020 will narrow in 2021.** Global trade tensions kept developing Asia's exports and imports in the doldrums in 2019, but imports fell more sharply, reflecting in part lower investment growth in the region. Trade growth will likely weaken even further this year as domestic demand wanes and trade and supply are disrupted by the COVID-19 outbreak. Thus, the regional current account surplus for the whole of developing Asia will expand only slightly from 1.5% of GDP in 2019 to 1.6% in 2020, before falling back to 1.4% in 2021.
- **COVID-19 poses a grave threat to the regional and global outlooks.** The forecast assumes containment of the outbreak within this year and a return to normal next year. But even as the epicenter of the disease has shifted to Europe and the US, the potential for additional outbreaks in the region and worldwide remains, and there is vast uncertainty about the duration and severity of the pandemic. Hence outcomes can be worse than forecast and growth may not recover as quickly. The *Special Topic* in this report is an updated assessment of the regional and global impacts of the outbreak, and indicates substantial downside risks if it spreads further in the region's economies. The possibility of a financial crisis cannot be discounted and the pandemic could also bring about fundamental changes to the global economy over the long term.

The impact of COVID-19 on developing Asia—an update

- **The rapid spread of Coronavirus Disease 2019 (COVID-19) has made it the worst pandemic in a century.** The outbreak was still concentrated primarily in the People’s Republic of China (PRC) when ADB released initial estimates of its economic impact on 6 March. Since then the outbreak has expanded significantly, with its epicenter shifting to Europe and the United States. The use of containment measures such as travel bans and community quarantines has expanded greatly. And data from the PRC indicate that the outbreak caused a double-digit decline in economic activity in the first quarter of 2020.
- **Updated scenarios suggest a much larger impact than previously envisioned, reflecting these new realities.** The range of scenarios explored in this update suggest a global cost of between \$2.0 and \$4.1 trillion, equivalent to between 2.3% and 4.8% of global GDP. The much higher estimate reflects its spread to Europe, the United States, and other major economies. Developing Asia including the PRC accounts for just 22% to 36% of the total. Nevertheless, regional economies will be hit hard, with an impact on the PRC of close to 5% of GDP. The loss to the rest of developing Asia will be between 1.0% and 2.2% of GDP. The analysis provides estimates of the impact on individual economies in developing Asia, and on sectors within them, including the additional impact on an economy if it experiences a significant outbreak of its own.

Estimated global and regional impact of the COVID-19 outbreak, under different scenarios

| | Shorter containment, smaller demand shocks | | Longer containment, larger demand shocks | |
|-----------------------------------|-----------------------------------------------|-----------------------|---------------------------------------------|-----------------------|
| | % of GDP | Losses, \$ billion | % of GDP | Losses, \$ billion |
| World | -2.3 | 2,013.0 | -4.8 | 4,090.8 |
| People’s Republic of China | -4.6 | 628.0 | -5.1 | 691.6 |
| Developing Asia excluding the PRC | -1.0 | 93.3 | -2.2 | 200.1 |
| Rest of the world | -2.0 | 1,291.6 | -5.1 | 3,199.1 |

GDP = gross domestic product, PRC = People’s Republic of China.

Source: ADB estimates.

Outlook by subregion

- **Developing Asia will suffer a sharp slowdown in 2020 as it struggles to contain COVID-19.** Growth will slow in most regional economies this year, with output in 9 of 46 ADB developing member countries expected to shrink. Aggregate economic growth will decelerate to 2.2% in 2020 but reaccelerate to 6.2% in 2021. By subregion, deceleration will be mildest in South Asia and steepest in the Pacific.
- **East Asia will weaken but can expect to bounce back.** The slowdown is most prominent in the PRC, where the global health crisis first emerged. Recession in Hong Kong, China caused by separate stresses at home and abroad in 2019 will deepen in 2020 but begin to ease as fiscal responses and stronger exports bring recovery, probably beginning in 2021. Growth in the ROK and Taipei, China will dip this year before rising next year on public spending and resurgent exports. Similarly, growth in Mongolia will decline this year as FDI inflow ebbs but will climb next year as mining and investment pick up. Despite the growth slowdown this year, inflation in the subregion will accelerate to 3.2% on temporarily higher prices for food, especially pork, in the heavily weighted PRC, and as inflation inches up in the ROK. In the rest of the subregion, inflation will slow in 2020 as demand wanes and then quicken in 2021 as economic activity revives.
- **South Asia will face a milder slowdown.** Growth in South Asia will decelerate to 4.1% in 2020 and then recover to 6.0% in 2021, largely tracking the trend in the dominant Indian economy. GDP performance will remain strong in Bangladesh, which is forecast to grow by 7.8% this year even as global demand pulls back, and continue to accelerate in Bhutan both this year and next as a new 5-year plan strengthens government spending, and despite lower tourist arrivals. Maldives and Sri Lanka are less sheltered from global efforts to limit the spread of COVID-19, which are forecast to cause the tourism-dominated economy of Maldives to contract by 3.0% in 2020 before surging back in 2021. Leaving aside external upheaval, growth in Pakistan will slow as agriculture stagnates, notably affecting cotton output, and as stabilization efforts constrain domestic demand. The intended correction of macroeconomic imbalances in Pakistan should restore confidence in the economy and bring later benefits. Inflation in the subregion will soften to 4.1% in 2020 as food inflation eases in India with improved agriculture. Unusually low inflation will continue in Maldives with subsidies and price controls on basic goods joined by anticipated deterioration in demand. Pakistan, by contrast, will struggle this year with double-digit inflation fueled by escalating food prices, scheduled hikes to utility rates, and domestic currency depreciation.
- **Southeast Asia will track the PRC and decelerate to 1.0% growth in 2020.** All economies in the subregion will endure a growth slowdown in 2020 because of COVID-19 and a consequent global slump, especially given their strong trade and investment ties with a slowing PRC. Thailand, the second-largest economy in the subregion, will likely contract by 4.8% this year, continuing a steady slide in recent years. Growth in the closely intertwined economies of Malaysia and Singapore will plummet nearly to zero in 2020, with only Malaysia enjoying a strong rebound next year. Cambodia and Indonesia will see sharp deceleration, as will the Philippines despite expansionary government policies, which should

facilitate an upturn in 2021. Growth in Viet Nam is forecast to decelerate significantly but remain uniquely robust in the subregion. With most economies weakening and global oil prices softening, subregional inflation should stay tame at just 1.9% in 2020 and 2.2% in 2021. Counting mitigated deflation in Brunei Darussalam, 8 of the 11 economies will see somewhat higher inflation this year because of continued food price pressure, but inflation will slow in Myanmar and the Philippines and reverse to a deflation in Thailand.

- **Central Asia will decelerate under COVID-19 after steady acceleration in recent years.** Growth in the subregion will drop to 2.8% in 2020 as economies falter worldwide and drag down global commodity prices. Lower petroleum prices and sluggish production will weaken oil exporters, with growth slowing to 0.5% in Azerbaijan and 1.8% in Kazakhstan, the largest economy in the subregion, slowed as well as by reduced public investment. Fiscal consolidation and lower remittances from the Russian Federation will weaken growth in Tajikistan. Georgia's highly tourism- and trade-dependent economy will be particularly vulnerable to COVID-19 as closed borders and monetary tightening grind growth to a halt in 2020. Growth in Armenia, a metal producer notable for its sales to the PRC, will fall sharply this year, and slower mineral exports to the PRC will slow growth less dramatically in the Kyrgyz Republic and Uzbekistan. Subregional inflation at 7.6% this year will be little changed as mixed projections balance out. Monetary tightening is expected to lower inflation in Georgia and Uzbekistan both years and in Kazakhstan in 2021.
- **The Pacific will be hard hit by the pandemic and resulting global slowdown.** Combined output in the subregion is forecast to decline by 0.3% in 2020 as 5 of its 14 economies contract. Countries that rely heavily on tourism and commodity exports will be particularly vulnerable. Fiji's dependence on both will cause the steepest decline, with GDP contracting by 4.9%. The Cook Islands, Palau, Samoa, and Vanuatu, which also have large tourist industries, will see output shrink this year. As restrictions on the movement of labor and capital equipment delay infrastructure projects, growth will suffer in smaller economies. With only subdued recovery in 2021, growth in the subregion will remain below average in developing Asia next year. Inflation will edge down to 2.7% this year with fading demand but rebound to 3.8% in 2021 on expected currency depreciation in Papua New Guinea, the largest economy in the subregion, and growth recovery in Fiji, the second largest.

What drives innovation in Asia?

Innovating for inclusive and sustainable growth

- **Innovation is a complex, diverse, and multifaceted process.** The term refers to new, significantly different products and processes that improve productivity and benefit users. Innovation occurs through a wide range of activities carried out by a variety of actors. Some innovations are game changers, such as the mobile phones that left landline phones to gather dust. Much more common are incremental innovations, such as those that create more and better features in mobile phones. While first-in-the-world frontier innovations like driverless cars grab most of the headlines, developing Asia receives more impetus from a steady stream of first-in-your-market catch-up innovations.
- **Asia's emergence as a middle-income region argues for more innovation.** The region owes its transition from low to middle income to the accumulation of production factors such as capital and skilled workers and to productivity growth—the latter assuming a larger role in growth as economies mature and become heavily dependent on innovation. Middle-income countries that successfully graduate to high income invest three times more on research and development (R&D) than do countries mired in the middle-income trap, and they file four times more patent applications. The Republic of Korea (ROK) and Asia's other three newly industrialized economies are examples of economies innovating their way to high income.
- **Innovation can promote more inclusive and sustainable growth.** Innovation sustains regional growth and improves its quality in an inclusive manner. Many basic innovations—notable examples being insecticide-treated bed nets, cost-effective water filters, and payments transacted through mobile phones—can improve the quality of life for the most disadvantaged and are often the brainchildren of impoverished innovators with the keenest insights into the needs of these communities. Similarly, green innovations in energy, transport, and other areas promote a cleaner environment.

Landscape of innovation in Asia

- **The innovation gap is narrowing, but unevenly.** While advanced economies invest on average 2.5% of their GDP in R&D, developing Asia is close behind at 2.1%, up from 0.9% in the late 1990s. Excluding the four newly industrialized economies, investment in developing Asia equals 1.9% of GDP, well ahead of 0.8% in Latin America. However, Asia's high average masks wide variation across countries, with lower-income countries more likely to undertake catch-up adaptation than innovate at the global technology frontier.
- **Evidence from firms shows that Asia already innovates a lot.** Analysis of almost 27,000 firms in developing Asia finds that 53% of them innovate to produce new products, processes, or both. However, most innovation by firms improves existing products or processes incrementally, at some distance from the global technology frontier. This explains why reported innovation rates are higher among firms in low-income countries with greater scope for incremental, catch-up innovation. In the region as a whole, firms that are relatively innovative

are usually larger, older, active exporters, or engaged in information and communication technology (ICT) or high-tech manufacturing.

- **Research highlights the role of R&D, human capital, and infrastructure.** Cross-country analysis finds a positive relationship between innovation and economic growth across countries, and, in developing Asia, between innovation and spending on R&D and human capital. The effect of human capital is more pronounced and robust. A 1% increase in secondary school enrollment is associated with increased innovation, proxied by patent flows, by 2%. The coverage and quality of energy, transport, and ICT infrastructure also correlate positively with innovation. The effect of human capital investment is especially robust, as detailed below.

Fostering innovators and an innovative culture

- **Evidence from firms strongly links human capital and innovation.** Intuitively, a workforce that is highly skilled and educated, especially to the tertiary level, powers a more innovative economy. Many innovators who achieve technological breakthroughs are, after all, scientists and engineers. Analysis of firms in Asia that considered three indicators of human capital—workers’ formal educational attainment, managerial experience, and training provided by firms—found a robust positive association between human capital and innovation. Firms that trained their employees, for example, were more likely to innovate than were firms that did not, by as much as 12.4 percentage points.
- **Sound education systems can help create a larger pool of innovators.** However, the link between education and innovation is not automatic. A prerequisite for a well-educated workforce that can innovate is high-quality education in literacy, numeracy, and other basic skills. Where education systems fail to deliver, they must be reformed thoroughly to improve the quality of education in basic skills. More student-centered teaching can foster creative and innovative thinking. Finally, a mix of skills is needed to drive innovation. While the STEM quartet of science, technology, engineering, and math clearly provide key competencies that promote innovation, other qualities critical to innovation—such as creativity, critical thinking, collaboration, and grit—must also be nurtured.
- **Strong institutions enable innovative entrepreneurs.** The quality of entrepreneurship in an economy is more important for innovation than its quantity. A very small minority of entrepreneurs, known in the business world as “gazelles,” account for the bulk of innovation and job growth, while most entrepreneurs neither innovate nor create jobs. A country’s ability to foster gazelles depends largely on its institutional conditions. Analysis of more than 36,000 businesses in 17 Asian economies reveals that strong property rights and rule of law encourage entrepreneurs to formalize their businesses, and that growth in formalized businesses is associated with greater innovation.
- **Rapid advances in ICT have revolutionized the entrepreneurial ecosystem.** Technological developments have sharply reduced the cost of innovative entrepreneurship. They have spawned new business models that use frontier technology platforms such as the Global Positioning System, as

exemplified by the ride-sharing and delivery services Gojek and Grab. As a result, entrepreneurial ecosystems have emerged and multiplied all over the world to exploit entrepreneurial opportunities opened up by the global digital transformation. This transformation is driven by relentless advances in digital technology and infrastructure, notably the internet. The transformation of Alibaba and Amazon into global tech giants illustrate the huge potential of digital entrepreneurship.

Conducive institutions and environment for innovators

- **Intellectual protection should reflect the stage of economic development.** Patents and industrial design are critical for frontier innovations and in higher-income economies. Other types of intellectual property rights such as utility models or petty patents are better suited to the incremental catch-up innovations that are important in less-developed countries. Analysis of more than 7,000 firms in the ROK from 1970 to 2010 indicates that petty patents and trademarks facilitated firms' growth during the country's earliest development stage. Design protection assumed a bigger role during the subsequent catch-up phase of ROK development, and patents became prominent during the most recent globalized phase. Thus, property rights cannot be judged solely on whether they are strong or weak. It is more important to offer the right type of intellectual property protection for a country's stage of development.
- **Equity and other capital markets are key to financing innovation.** Analysis of patent data by industry in 47 countries from 1997 to 2016 reveals that financial markets matter greatly to innovation in an economy. The vitality of both the equity market and the debt market have positive and significant effects on R&D efficiency, as measured by the number of patents granted. Equity and debt markets also have positive and significant effects on innovation quality, as measured by citations in research papers. The effect is more pronounced for equity markets. The implication for Asian countries is that they should continue to develop their capital markets.
- **Evidence confirms the importance of cities as engines of innovation.** Innovation tends to be concentrated in a few urban innovation hubs able to generate strong agglomeration economies. Across Asia, such concentration of innovation can be seen in product innovation, process innovation, and R&D. The 10 most innovative cities in the People's Republic of China (PRC) account for 72% of product innovation but only 55% of the urban population. In India, the corresponding figures are 76% of innovation but only 43% of the urban population. Evidence shows that city size has a significant effect on innovative activity, with firms in larger cities tending to be more innovative, as does the presence of top-tier universities. However, haphazard urbanization that causes traffic congestion and other urban ills can undermine a city's potential as an engine of innovation and growth.

Toward a more innovative Asia

- **Asian governments can and should become catalysts for innovation.** Governments play a major direct role in innovative activity and sponsor a substantial share of R&D. From 1996 to 2017, government shares of R&D

were 23% in the PRC, 24% in the ROK, and 42% in Viet Nam. While private R&D typically concentrates on immediately practical commercial applications, governments tend to support basic research that can spill over in multiple directions. Plenty of scope exists, however, for government-supported innovation to improve products and processes directly. Public sector innovation labs like those in Armenia and Sri Lanka can promote experimentation and openness to new approaches.

- **The policy environment for innovators must evolve with the economy.** Each country has a unique national innovation system to address market failures which are inherent in innovation. Governments should play direct and leading roles in developing these systems at their early stages but shift to less direct, supportive functions after the private sector has stepped up and assumed a bigger role. Meanwhile, the evidence is mixed on how effective active innovation policies are. Subsidies paid by Innofund, for example, through which the Government of the PRC supports R&D by smaller tech companies, seem to offer only limited increments in innovative output. This observation highlights the need for nuance in government interventions.
- **Local policies must complement national policies to foster innovation.** To facilitate local entrepreneurial ecosystems, local policies should adhere to key principles: (i) adopting a bottom-up approach to facilitate entrepreneurship, more than can be achieved with a top-down hierarchical approach; (ii) close engagement with all stakeholders; (iii) nurturing communities of entrepreneurs, accelerators, financiers, large businesses, mentors, public agencies, educational institutions, and regional agencies by serving as their secretariat; (iv) enabling entrepreneurs to share their knowledge gleaned from business model experiments by promoting networking events and platforms; and (v) encouraging active public-private interaction through systematic and institutionalized dialogue. Local policies can thus help cities and other localities realize their potential to apply new technologies to incubate innovation and new business models.

| GDP growth rate and inflation, % per year | | | | | | | | |
|-------------------------------------------|------------|------------|-------------|------------|------------|------------|------------|------------|
| | GDP growth | | | | Inflation | | | |
| | 2018 | 2019 | 2020 | 2021 | 2018 | 2019 | 2020 | 2021 |
| Central Asia | 4.4 | 4.9 | 2.8 | 4.2 | 8.2 | 7.5 | 7.6 | 6.3 |
| Armenia | 5.2 | 7.6 | 2.2 | 4.5 | 2.5 | 1.4 | 2.8 | 2.2 |
| Azerbaijan | 1.4 | 2.2 | 0.5 | 1.5 | 2.3 | 2.6 | 2.5 | 3.5 |
| Georgia | 4.8 | 5.1 | 0.0 | 4.5 | 2.6 | 4.9 | 4.5 | 3.0 |
| Kazakhstan | 4.1 | 4.5 | 1.8 | 3.6 | 6.0 | 5.3 | 6.0 | 5.7 |
| Kyrgyz Republic | 3.8 | 4.5 | 4.0 | 4.5 | 1.5 | 1.1 | 3.5 | 3.0 |
| Tajikistan | 7.3 | 7.5 | 5.5 | 5.0 | 5.4 | 8.0 | 9.0 | 8.0 |
| Turkmenistan | 6.2 | 6.3 | 6.0 | 5.8 | 13.2 | 13.4 | 13.0 | 8.0 |
| Uzbekistan | 5.4 | 5.6 | 4.7 | 5.8 | 17.5 | 14.6 | 13.0 | 10.0 |
| East Asia | 6.1 | 5.4 | 2.0 | 6.5 | 2.0 | 2.6 | 3.2 | 1.8 |
| Hong Kong, China | 2.9 | -1.2 | -3.3 | 3.5 | 2.4 | 2.9 | 2.0 | 2.5 |
| Mongolia | 7.2 | 5.1 | 2.1 | 4.6 | 6.8 | 7.3 | 6.6 | 7.9 |
| People's Republic of China | 6.7 | 6.1 | 2.3 | 7.3 | 2.1 | 2.9 | 3.6 | 1.9 |
| Republic of Korea | 2.7 | 2.0 | 1.3 | 2.3 | 1.5 | 0.4 | 0.9 | 1.3 |
| Taipei, China | 2.7 | 2.7 | 1.8 | 2.5 | 1.3 | 0.6 | 0.4 | 0.8 |
| South Asia | 6.1 | 5.1 | 4.1 | 6.0 | 3.7 | 4.9 | 4.1 | 4.4 |
| Afghanistan | 2.7 | 3.0 | 3.0 | 4.0 | 0.6 | 2.3 | 2.3 | 3.5 |
| Bangladesh | 7.9 | 8.2 | 7.8 | 8.0 | 5.8 | 5.5 | 5.6 | 5.5 |
| Bhutan | 3.8 | 4.4 | 5.2 | 5.8 | 3.7 | 2.8 | 3.8 | 4.0 |
| India | 6.1 | 5.0 | 4.0 | 6.2 | 3.4 | 4.7 | 3.0 | 3.8 |
| Maldives | 6.9 | 5.7 | -3.0 | 7.5 | -0.1 | 0.2 | 1.0 | 1.2 |
| Nepal | 6.7 | 7.1 | 5.3 | 6.4 | 4.2 | 4.6 | 6.0 | 5.5 |
| Pakistan | 5.5 | 3.3 | 2.6 | 3.2 | 4.7 | 6.8 | 11.5 | 8.3 |
| Sri Lanka | 3.2 | 2.6 | 2.2 | 3.5 | 4.3 | 4.3 | 5.0 | 4.8 |
| Southeast Asia | 5.1 | 4.4 | 1.0 | 4.7 | 2.6 | 2.1 | 1.9 | 2.2 |
| Brunei Darussalam | 0.1 | 3.9 | 2.0 | 3.0 | 1.0 | -0.4 | -0.2 | 0.1 |
| Cambodia | 7.5 | 7.1 | 2.3 | 5.7 | 2.5 | 1.9 | 2.1 | 1.8 |
| Indonesia | 5.2 | 5.0 | 2.5 | 5.0 | 3.2 | 2.8 | 3.0 | 2.8 |
| Lao People's Dem. Rep. | 6.2 | 5.0 | 3.5 | 6.0 | 2.0 | 3.3 | 4.0 | 4.5 |
| Malaysia | 4.7 | 4.3 | 0.5 | 5.5 | 1.0 | 0.7 | 1.0 | 1.3 |
| Myanmar | 6.4 | 6.8 | 4.2 | 6.8 | 5.9 | 8.6 | 7.5 | 7.5 |
| Philippines | 6.2 | 5.9 | 2.0 | 6.5 | 5.2 | 2.5 | 2.2 | 2.4 |
| Singapore | 3.4 | 0.7 | 0.2 | 2.0 | 0.4 | 0.6 | 0.7 | 1.3 |
| Thailand | 4.2 | 2.4 | -4.8 | 2.5 | 1.1 | 0.7 | -0.9 | 0.4 |
| Timor-Leste | -0.6 | 3.4 | -2.0 | 4.0 | 2.3 | 0.9 | 1.3 | 1.8 |
| Viet Nam | 7.1 | 7.0 | 4.8 | 6.8 | 3.5 | 2.8 | 3.3 | 3.5 |
| The Pacific | 0.4 | 3.8 | -0.3 | 2.7 | 4.3 | 3.0 | 2.7 | 3.8 |
| Cook Islands | 8.9 | 5.3 | -2.2 | 1.0 | 0.1 | 0.8 | 1.5 | 1.7 |
| Federated States of Micronesia | 0.2 | 3.0 | 1.6 | 3.0 | 1.4 | 1.0 | 0.5 | 1.0 |
| Fiji | 3.5 | 0.7 | -4.9 | 3.0 | 4.1 | 1.8 | 1.5 | 3.5 |
| Kiribati | 2.3 | 2.4 | 1.6 | 1.8 | 2.1 | -1.8 | 1.0 | 1.1 |
| Marshall Islands | 3.6 | 3.8 | 2.5 | 3.7 | 0.8 | 0.1 | 0.3 | 0.5 |
| Nauru | 5.7 | 1.0 | 0.4 | 1.1 | 0.5 | 3.9 | 2.8 | 2.3 |
| Niue | 6.5 | ... | ... | ... | 10.1 | ... | ... | ... |
| Palau | 1.5 | -3.1 | -4.5 | 1.2 | 2.0 | 0.6 | 0.4 | 0.8 |
| Papua New Guinea | -0.8 | 4.8 | 0.8 | 2.8 | 4.7 | 3.6 | 3.3 | 4.4 |
| Samoa | -2.2 | 3.5 | -3.0 | 0.8 | 3.6 | 2.2 | 2.0 | 2.5 |
| Solomon Islands | 3.9 | 2.6 | 1.5 | 2.7 | 3.5 | 1.6 | 2.0 | 2.3 |
| Tonga | 0.2 | 3.0 | 0.0 | 2.5 | 7.0 | 4.1 | 1.3 | 2.2 |
| Tuvalu | 4.3 | 4.1 | 2.7 | 3.2 | 1.8 | 3.3 | 3.5 | 3.5 |
| Vanuatu | 2.8 | 2.8 | -1.0 | 2.5 | 2.3 | 2.4 | 1.5 | 2.0 |
| Developing Asia | 5.9 | 5.2 | 2.2 | 6.2 | 2.5 | 2.9 | 3.2 | 2.3 |
| Developing Asia excluding the NIEs | 6.4 | 5.7 | 2.4 | 6.7 | 2.6 | 3.3 | 3.6 | 2.5 |

GDP = gross domestic product, NIEs = newly industrialized economies (Hong Kong, China; the Republic of Korea; Singapore; and Taipei, China).

Asian Development Outlook 2020 Highlights

What Drives Innovation in Asia?

The full report is available on the ADB website at <http://www.adb.org/ado2020>.

About the Asian Development Bank

ADB is committed to achieving a prosperous, inclusive, resilient, and sustainable Asia and the Pacific, while sustaining its efforts to eradicate extreme poverty. Established in 1966, it is owned by 68 members—49 from the region. Its main instruments for helping its developing member countries are policy dialogue, loans, equity investments, guarantees, grants, and technical assistance.



ASIAN DEVELOPMENT BANK

6 ADB Avenue, Mandaluyong City

1550 Metro Manila, Philippines

www.adb.org