

UNEVEN RECOVERY



Uneven Recovery

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Cover photo: Asian children wear a mask to prevent the spread of the virus and go home from school together happily by Pramote Polyamate © Getty Images. Used with the permission of Getty Images. Further permission required for reuse.

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List of Abbreviations

AMC	Advanced Market Commitment
DSA	Debt sustainability analysis
DSSI	Debt Service Suspension Initiative
EAP	East Asia and the Pacific
ECQ	Enhanced Community Quarantine
EIU	Economist Intelligence Unit
EMDE	Emerging Markets and Developing Countries
FDI	Foreign Direct Investment
GDP	Gross domestic product
GEP	Global Economic Prospects
GVC	Global Value Chain
IDS	International Debt Statistics
IMF	International Monetary Fund
LAYS	Learning-Adjusted Years of Schooling
LPM	Local projection method

MFN	Most Favored Nation
NBFI	Nonbank Financial Institutions
NPL	Nonperforming loans
OECD	Organisation for Economic Co-operation and Development
PBOC	People's Bank of China
PPEs	Personal protective equipment
PPG	Public and Publicly Guaranteed
PPP	Purchasing power parity
R&D	Research and Development
STRI	Services Trade Restrictions Index
SME	Small and medium enterprise
TFP	Total factor productivity
U.S.	United States
WHO	World Health Organization

Regions, World Bank Classification and Country Groups

EAP	East Asia and Pacific
ECA	Eastern Europe and Central Asia

LAC	Latin America and the Caribbean
MNA	Middle East and North Africa
SAR	South Asia
SSA	Sub-Saharan Africa

Country Abbreviations

AUS	Australia
BRA	Brazil
BRN	Brunei Darussalam
CAN	Canada
CHN	China
FJI	Fiji
FSM	Federated States of Micronesia
IDN	Indonesia
IND	India
JPN	Japan
KHM	Cambodia
KIR	Kiribati
KOR	Republic of Korea

LAO	Lao People's Democratic Republic
MEX	Mexico
MNG	Mongolia
MMR	Myanmar
MYS	Malaysia
NRU	Nauru
PHL	Philippines
PLW	Palau
PNG	Papua New Guinea
RMI	Republic of the Marshall Islands
RUS	Russia
SGP	Singapore
SLB	Solomon Islands
THA	Thailand
TLS	Timor-Leste

List of Abbreviations continued

TON	Tonga
TUR	Turkey
TUV	Tuvalu
UK	United Kingdom

USA	United States
VNM	Vietnam
VUT	Vanuatu
WSM	Samoa

<i>Currency Units</i>	
A\$	Australian dollar
\$NZ	New Zealand dollar
B	Thai baht
CR	Cambodian riel
D	Vietnamese dong
F\$	Fiji dollar
K	Myanmar kyat
K	Papua New Guinea kina

Kip	Lao kip
P	Philippine peso
RM	Malaysian ringgit
RMB	Chinese renminbi
Rp	Indonesian rupiah
SIS	Solomon Islands dollar
Tog	Mongolian tugrik
US\$	Timor-Leste (U.S. dollar)
US\$	United States dollar

Preface and Acknowledgments

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Throughout the report, geographic groupings are defined as follows:

Developing East Asia and Pacific comprises Cambodia, China, Indonesia, Lao People’s Democratic Republic (PDR), Malaysia, Mongolia, Myanmar, Papua New Guinea, the Philippines, Thailand, Timor-Leste, Vietnam, and the Pacific Island Countries.

The Pacific Island Countries comprise Fiji, Kiribati, the Marshall Islands, the Federated States of Micronesia, Nauru, Palau, Samoa, the Solomon Islands, Tonga, Tuvalu, and Vanuatu.

The **ASEAN** member countries comprise Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, the Philippines, Singapore, Thailand, and Vietnam. The ASEAN-5 comprise Indonesia, Malaysia, the Philippines, Thailand, and Vietnam.

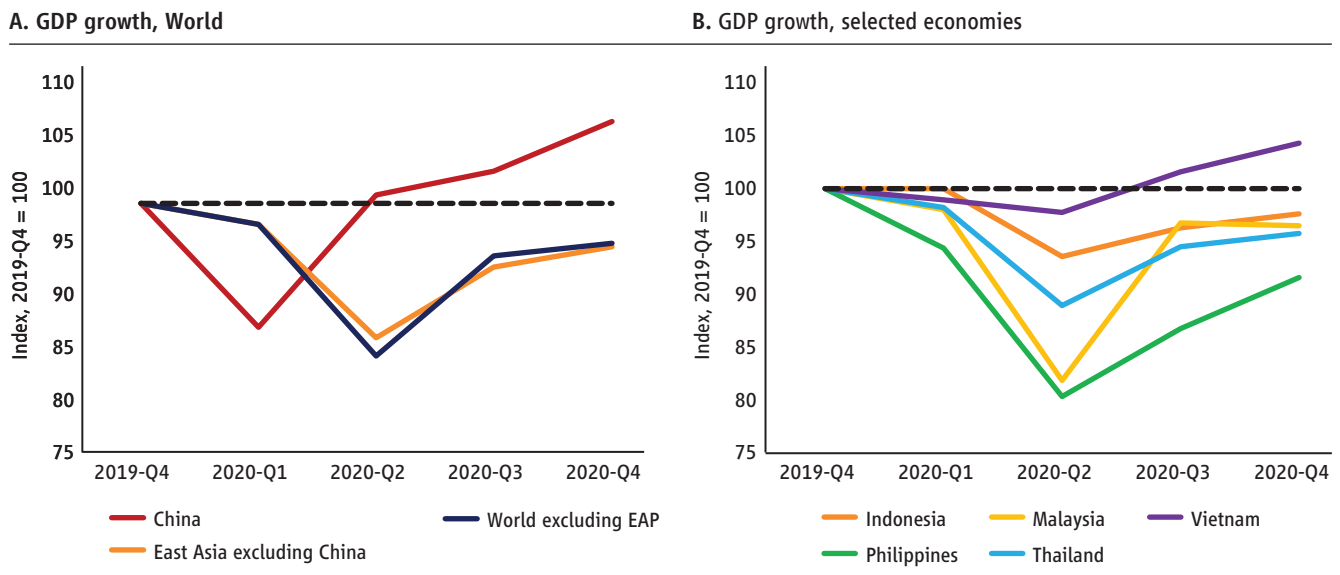
The analysis in this report is based on the latest country-level data available as of March 17, 2021.

Overview

Uneven containment: Like Hydra, the many-headed monster of Greek myth, COVID-19 is proving hard to suppress even a year after the first case was confirmed in Wuhan. China and Vietnam, which had largely contained the disease, saw occasional local outbreaks. Malaysia witnessed a significant resurgence, while Cambodia, Myanmar, Mongolia, and Thailand have seen more limited spurts in infections. Of the countries in which the virus raged a few months ago, the situation has improved in Indonesia, Malaysia, and the Philippines, but the number of cases remains high. The emergence of more transmissible variants of the variants of COVID-19, however, poses new challenges to the containment of the disease globally.

Three-speed recovery: Many of the economies in the region began to bounce back in the second half of 2020 after an initial slump. However, among major economies of the region, only China and Vietnam have followed a V-shape recovery path with output surpassing pre-COVID-19 levels in 2020 (Figure O.1). Most of the other countries have not seen a full-fledged recovery in terms of either output or growth momentum. By the end of 2020, output in the four other major economies had rebounded but remained on average around 5 percent below pre-pandemic levels, with the smallest gap in Indonesia (2.2 percent) and the largest gap in the Philippines (8.4 percent). Economic contraction has been particularly severe and persistent in some of the small island economies, with output in 2020 remaining more than 10 percent below pre-pandemic levels in Fiji, Palau, and Vanuatu. Due to the economic distress, poverty in the region stopped declining for the first time in 20 years and 32 million people were prevented from escaping poverty.

Figure O.1. China and Vietnam are leading the recovery in the EAP region



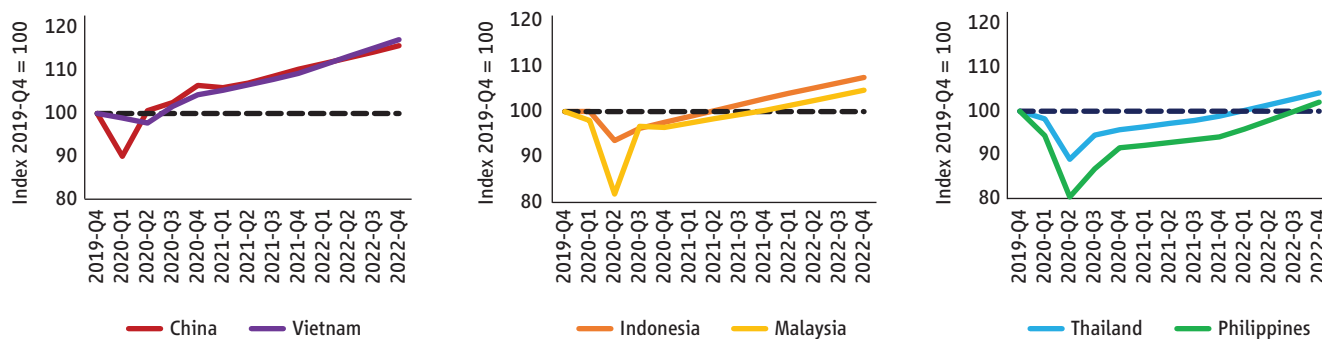
Sources: Haver Analytics; World Bank.
Notes: Dashed line refers to 2019-Q4 = 100 index line.

Determinants of growth performance: Economic performance across countries continues to depend primarily on (i) the efficiency with which the virus is contained; (ii) the ability to take advantage of the revival in international goods trade; and (iii) the capacity of governments to provide fiscal and monetary support. The countries with the weakest performance were the ones that suffered high rates of COVID-19 infections and mortality; that relied more on prolonged restrictions on mobility rather than an effective test-based strategy; that depend on earnings from tourism rather than exports of manufactured goods, especially electronics; and whose governments had limited fiscal space. The rollout of the vaccine has not so far

had an appreciable impact on growth in the region. Economic performance was also affected by country-specific factors, including *natural disasters* (Fiji, Tonga, Vanuatu, Thailand, Philippines), *other disease outbreaks* (Samoa), and *political uncertainty* (Malaysia, Myanmar, Papua New Guinea, Thailand, and Timor-Leste).

Mixed prospects: The reverberations from the COVID-19 shock will influence future performance. Successful containment of the disease in some countries will support a recovery of domestic economic activity, but lingering infections in other countries will be a drag on growth until wider implementation of the vaccine. Global economic recovery, supported in part by the significant US stimulus, will revive trade in goods and could provide an external boost to growth of as much as 1 percentage point on average, but global tourism is expected to remain below pre-pandemic levels till 2023 and delay economic recovery in tourism-dependent economies. Even though the global financial climate remains benign, weakened corporate and bank balance sheets and persistent global uncertainty will dampen investment. Growing public debt and widening fiscal deficits will constrain further government spending in the near term. Against this backdrop, only China and Vietnam are expected to grow strongly in 2021, by 8.1 percent and 6.6 percent, respectively, while the rest of the region is expected to grow by only 4.4 percent. In Indonesia and Malaysia, output is expected to recover to its pre-pandemic level over the course of 2021 (Figure O.2). In Thailand and in the Philippines, output is projected to remain below pre-pandemic levels until 2022. Among smaller countries, the recovery is expected to be particularly protracted in tourism-dependent Island economies, with growth expected to be negative in about half of the countries, even though they have been largely spared by the pandemic. Thanks to the rapid growth in China, regional growth is expected to accelerate from an estimated 1.2 in 2020 to 7.4 percent in 2021.

Figure O.2. Output will only slowly return to pre-COVID-19 levels in several of the region’s economies

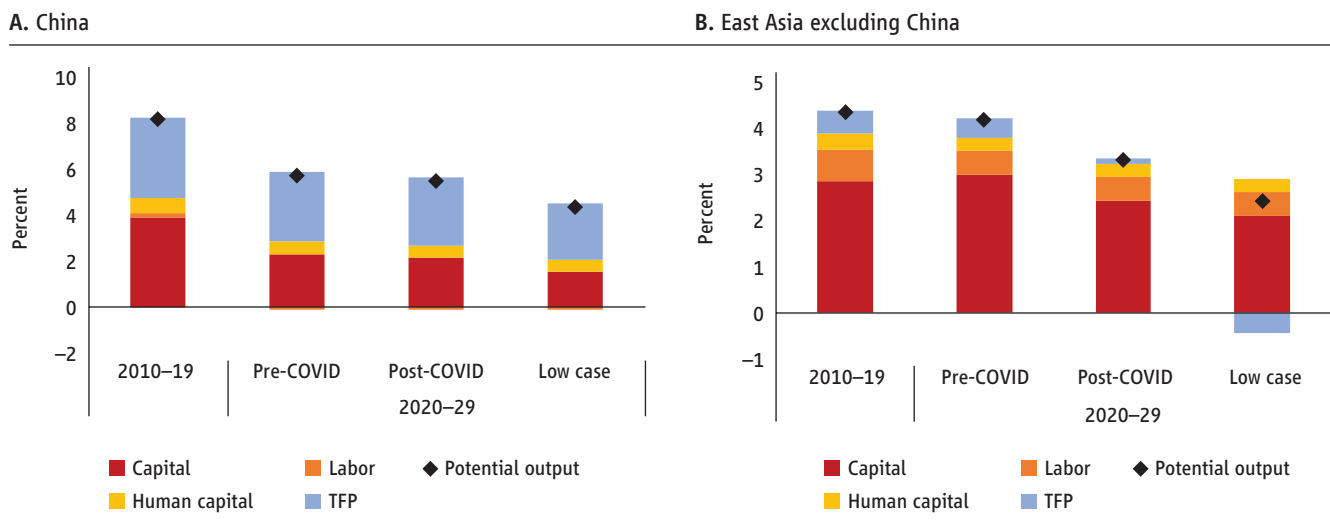


Source: World Bank staff estimates.
 Note: Black horizontal dotted line shows 2019-Q4 index.

Risks: Risks are more balanced than previously. On the positive side, successful vaccination campaigns and early control of the pandemic, together with significant policy reform and the diffusion on new technologies, could boost growth and undo some of the COVID-19 damage. The significant US stimulus could also boost growth, through domestic and international multiplier effects, to a larger extent than anticipated in our baseline estimates and bring the recovery forward on average by as much as one-quarter. However, on the downside, delays in vaccine distribution could lead to a persistence of infections and restrictions that could retard growth by about 1 percentage point. Slow global suppression of the disease increases the risk of the emergence of new variants, that could be more infectious, lethal and resistant to existing vaccines, and delay opening even in well-vaccinated countries. Continued economic pain may worsen balance sheets of financial and nonfinancial entities further, exacerbate the fiscal burden of contingent liabilities, and could lead to a financial crisis in some countries. The favorable financial climate, thanks in large part to the extraordinary global fiscal and monetary expansion, has so far helped countries avoid financial instability. The positive impact of the US stimulus could be eroded by the negative impact of the resultant global financial tightening, to which countries unable to take advantage of the trade opportunities would be more vulnerable.

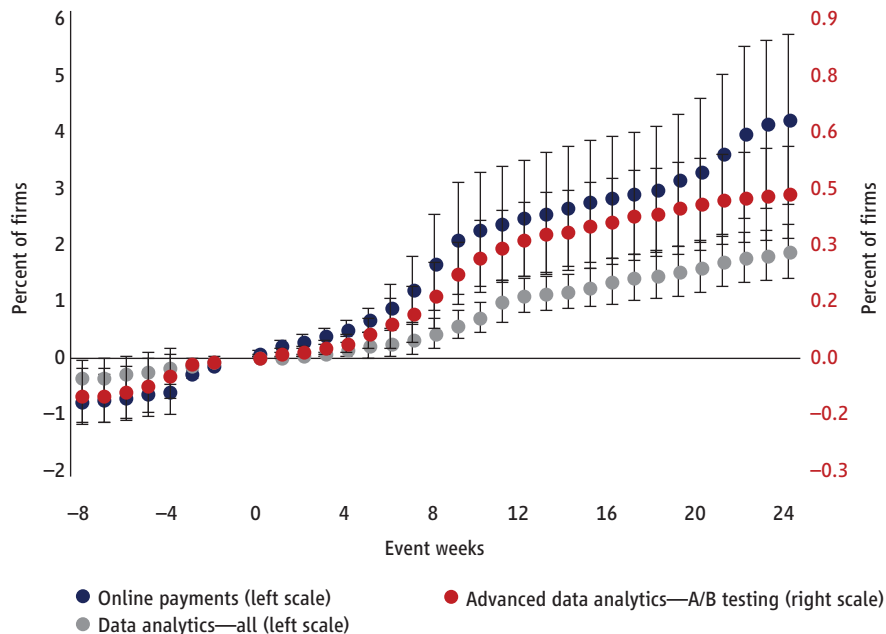
Slower long-term growth: As the previous Update warned, COVID-19 could have a lasting impact on inclusive longer-term growth. Rising indebtedness along with increased uncertainty are likely to inhibit public and private investment, as well as pose a risk to economic stability. Sickness, food insecurity, job losses, and school closures could lead to the erosion of human capital and lifetime earning losses. Students in the region are expected to lose 0.8 Learning-Adjusted Years of Schooling (LAYS) between January 2020 and December 2021. Inertia in the reallocation of resources away from firms and sectors with limited potential in a post-COVID-19 world, and lower investment in research and development could hurt productivity growth. Unless these problems are remedied, growth in the next decade could be as much as 1.8 percentage points lower than pre-COVID-19 projections in the region excluding China (Figure O.3), even considering the positive impact of the diffusion of new technologies (Figure O.4).

Figure O.3. COVID-19 scars could further retard growth over the next decade



Sources: Penn World Tables; World Bank staff estimations.
 Note: GDP-weighted averages of production function-based potential growth. TFP refers to total factor productivity growth.

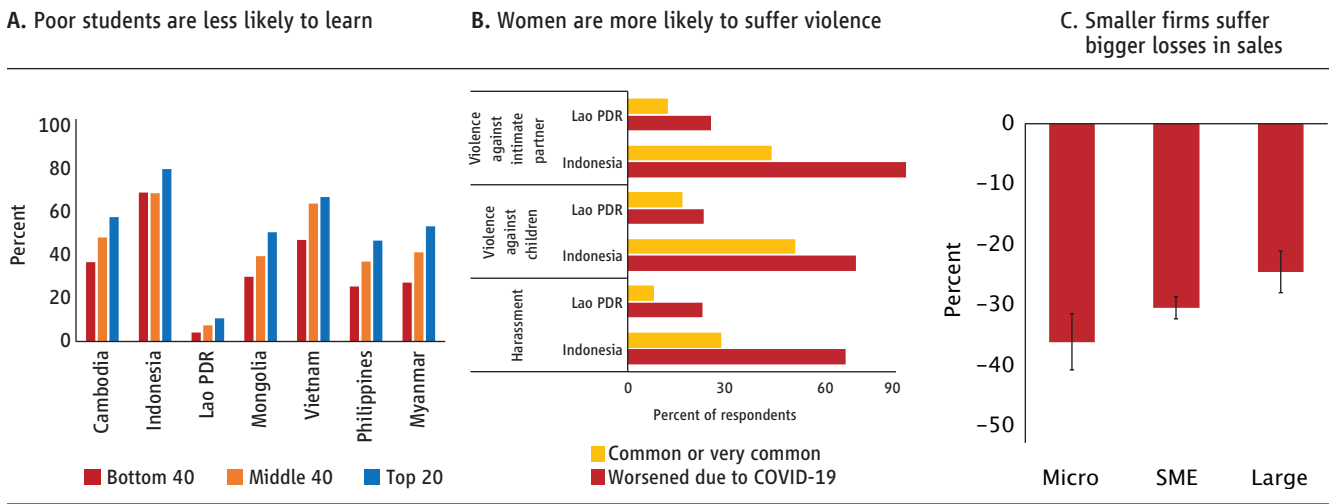
Figure O.4. COVID-19 has accelerated technology adoption by firms



Source: DeStefano and Timmis (forthcoming) using Builtwith data as of January 2021 matched to 2019 Aberdeen CI Technology Database (CITDB).
 Note: Event study plot where the x-axis shows event time in weeks—relative to the first COVID-19 cases. COVID-19 cases taken from Oxford Covid-19 Government Response Tracker. Unweighted average of country-level adoption for firms in Brazil, China, the Czech Republic, Hungary, India, Mexico, Poland, the Slovak Republic, and Thailand. Includes country fixed effects, and standard errors clustered at country levels. Bars reflect 95 percent confidence intervals. Coefficients are normalized relative to the omitted category at week t-1, the week before the first COVID cases. Data analytics includes both advanced functions, such as A/B testing, and more basic functions, such as visitor count tracking, feedback forms, and error tracking. A/B testing reflects an advanced data analytic technology, where firms randomly show visitors different versions of their website, and track visitor behavior (such as purchases) in response, in order to optimize their website design.

Increased inequality: The disease and the resulting shutdown, as well as the asymmetric access to social support and digital technologies, are all likely to have increased inequality. Precisely how much is hard to establish because surveys often do not capture well those at the very top and the very bottom of the income and consumption distribution. But there is circumstantial evidence of worsened inequality along at least three dimensions. First, the depletion of physical and human capital is more dire among the poor because they suffer greater food insecurity and learning losses. In some countries, children of households in the bottom 40 percent of the distribution are 20 percentage points less likely to be engaged in learning than children of the top 20 percent (Figure O.5). When faced with income losses, poorer households are more likely to reduce their food consumption, drop out of school, accumulate debt, and sell assets, all of which undermine their ability to recover from the crisis. Second, women are suffering more than men: 25 percent of respondents in Lao PDR and 83 percent in Indonesia said that intimate partner violence worsened due to COVID-19. Food insecurity makes women more vulnerable to violence, and economic empowerment less so. Third, SMEs and microenterprises suffered a proportionally larger drop in sales than large firms, even after controlling for differences in labor productivity, age, and location. Sales of microenterprises shrank by 33 percent and of large firms by only 25 percent. Smaller firms were also less likely to take advantage of new digital opportunities.

Figure O.5. Inequality is increasing across multiple dimensions



Sources: World Bank High-Frequency Household Phone surveys; EAPGIL High-Frequency Phone surveys; Business Pulse Surveys.
 Note: A. Share of households with enrolled students that were engaged in online, mobile, or face-to-face learning activities. B. Share of respondents reporting that violence in the community is present and has increased. C. Loss of sales by firm size. Data are from multiple rounds of surveys. Bars show percent of total. Micro, SME and Large are defined as firms with less than 5, 5–100, and 100+ employees, respectively.

Policy dilemmas: The COVID crisis has confronted policy makers in EAP countries with a series of difficult decisions. Governments have wrestled with the choice between saving lives and saving livelihoods (Box O.1). Health care authorities have had to allocate scarce resources between treatment and prevention. In some cases, inadequate policy analysis may have allowed the political imperative to prevail at significant human cost. Looking ahead, at least three key issues will need to be carefully addressed. In each case, more meaningful international cooperation would lead to significantly better outcomes for all countries than unilateral action.

Box O.1. COVID-related policy issues examined in recent economic updates

The Spring 2021 EAP Economic Update addresses three policy dimensions: *vaccination* to contain COVID-19; *fiscal policy* for relief, recovery, and growth; and *climate policy* to build back better. The Spring and Fall 2020 Updates have focused on a number of other policy issues, including: (i) *smart containment* of COVID-19, especially through nonpharmaceutical interventions like test tracing and isolation; (ii) *smart schooling* to prevent long-term losses of human capital, especially for the poor; (iii) *social protection* to help households smooth consumption, and workers reintegrate as countries recover; (iv) *support for firms* to prevent bankruptcies and unemployment, without unduly inhibiting the efficient reallocation of workers and resources; (v) *financial sector policies* to support relief and recovery without undermining financial stability; and (vi) *trade reform*, especially of still-protected services sectors—finance, transport, communications—to enhance firm productivity, avert pressures to protect other sectors, and equip people to take advantage of the digital opportunities whose emergence the pandemic is accelerating.

The race between infections and vaccination

COVID-19 vaccines alone will not end the pandemic soon for two reasons. Even though vaccine production may be enough to cover all adults in the world by end-2021, inequalities in vaccine efficacy and distribution imply that most countries will not be able to achieve herd immunity levels. Estimates show that at the end of 2021, in the most optimistic scenario, efficacy-adjusted coverage in high-income countries will be 81 percent and in developing countries 55 percent (Figure O.6). At the same time, new more infectious and possibly immune resistant variants of concern (VOCs) are likely to exacerbate outcomes by impairing vaccine effectiveness and increasing coverage levels needed for herd immunity. What are the policy implications of the divergence in access and the emergence of new variants?

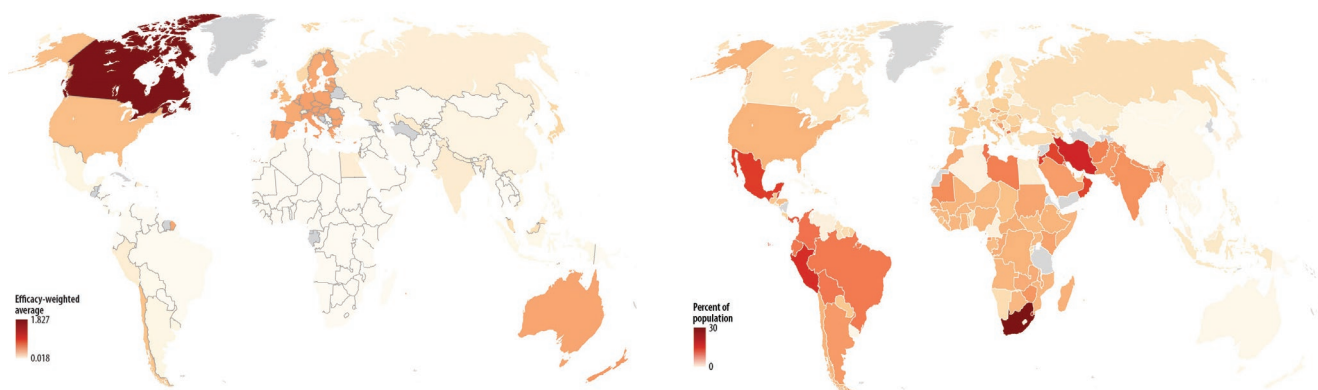
- First, in countries where COVID-19 control has not been achieved, like Indonesia and the Philippines, rapid vaccination is a priority to reduce high numbers of deaths and pressure on struggling health systems. The challenge for these countries is to procure and distribute sufficient vaccines and to address any vaccine hesitancy among people through effective information campaigns. Countries, such as China and Vietnam, that are effectively pursuing COVID-19 elimination, have space to develop a more suitable vaccination strategy for their large populations (see Table O.1A–B at the end of the Overview). For example, even as they move quickly to vaccinate the more vulnerable, they may choose to implement mass vaccination gradually as they obtain better evidence on the efficacy of vaccines and against the VOCs.
- Second, since vaccination will not be sufficient to suppress viral transmission soon in most countries, governments must enhance other non-pharmaceutical interventions (NPIs), especially testing-tracing-isolation, that would magnify the impact and cost-effectiveness of vaccines.
- Third, the threat posed by new VOCs creates a global health and economic interest in suppressing viral transmission everywhere. Striving for suppression is also likely to make it easier to manage longer-term outcomes in which the new coronavirus becomes endemic like influenza.
- Export restrictions on COVID-19–related medical products could create a mismatch between access and need, making it harder to contain the disease. Therefore, it is important to keep trade open along the value chain for vaccines and other medical products.

- The threat of VOCs also strengthens incentives for countries like China which have suppressed infection at home to prioritize vaccine allocation to high transmission countries where VOCs are most likely to emerge. While China has already exported vaccines to 22 countries, it could scale up and export more vaccines if efforts to obtain international approval were accelerated, and if a better balance were struck between public safety and production efficiency, easing the manufacture of multi-val vaccines, at least for exports.
- For deeper international cooperation to be rational for individual countries, global suppression must be credible—which requires adequate global supplies of vaccines and NPI consumables. Therefore, China, Europe, India, Russia, the US, and other countries need to collaborate more closely in efficient approval and production of effective vaccines and consumables for NPIs.

Figure O.6. Access to vaccines is unequally distributed across countries, and does not match infection-suppression needs

A. Efficacy-adjusted vaccine purchases and commitments end-2021

B. Cumulative infection rates end-2020

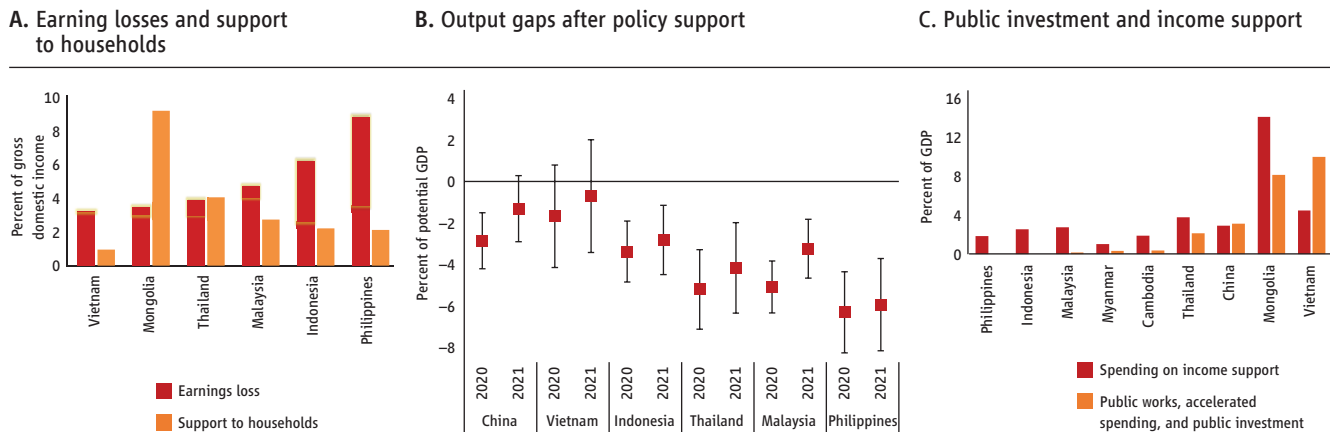


Sources: A. Duke Global Health Innovation Center; COVAX; Information published by official agencies, manufacturers and news media as of 19 February 2021. B. World Bank staff estimates.
 Note: A. Available vaccine volumes based on reported production to end-2021, with estimation of 2021 production in cases where information sources do not provide breakdowns by year. Allocations based on information on country purchases, allocations and plans obtained from news media. B. Chart presents estimates of the cumulative COVID-19 infection rate by end-2020, based on adjusting mortality-based estimates of cumulative infection rates for underreporting of deaths by using reported seroprevalence estimates.

Providing fiscal support without undermining stability

Fiscal policy today is expected to play a demanding triple-role of supporting relief, recovery and growth. Relief is needed to help households to smooth consumption and firms to avoid bankruptcy or damaging contraction. Recovery requires a fiscal stimulus because the COVID-19 shock threatens to lock the economy into an underemployment equilibrium. Growth requires public investment in both hard and soft infrastructure. The evidence so far suggests that in many EAP countries, relief is less than earning losses, stimulus has not fully remedied deficient demand, and public investment is not a significant part of recovery efforts (Figure O.7).

Figure O.7. In many EAP countries, *relief* has not matched earning losses, *stimulus* has not offset output shortfalls, and *public investment* has not been scaled up



Sources: Consensus Economics; Haver Analytics; International Monetary Fund; J.P. Morgan; World Bank staff calculations.

Note: A. Earnings losses are calculated as loss in employment multiplied by changes in wages between 2019-Q4 and 2020-Q2 (or next available data point). B. Output gap based on estimates from a modified multivariate filter model of World Bank (2018a). Error bands reflect 90 percent confidence intervals. C. "Spending on income support" includes support in the form of direct transfers and revenue measures both to households (as shown in panel A) and to firms. Data is for year 2020.

How far do government choices reflect constraints on borrowing and spending (see Table O.2 at the end of the Overview)? As governments committed to fiscal support equal to nearly 10 percent of GDP in 2020, public debt increased on average by more than 7 percent of GDP. The fact that interest rates have been significantly lower than growth rates for EAP countries suggests that even large primary deficits may not threaten debt sustainability. However, governments for good reason do not see the wedge between growth and interest rates as a license for unlimited borrowing. The differential is not stable and has been subject to reversals in sign; interest rates are not exogenous but sensitive to high fiscal deficits and debt; markets can be spooked by vulnerabilities like foreign currency debt, overvalued exchange rates, financial system fragilities and commodity dependence; and higher debt service and low revenue generating capacity in EAP countries can crowd out public investment hurting recovery and growth.

Countries, therefore, face trade-offs as they balance the continued need for economic support against the risk of future instability. The trade-offs could be softened.

- First, governments in the EAP region can do much to increase the efficiency of expenditure. Now that recovery is underway, support to households and firms could be better targeted. In Indonesia, Mongolia, and the Philippines, households whose incomes were unchanged during the crisis were almost as likely to receive assistance as those who suffered income losses. Similarly, in Cambodia, Indonesia, Malaysia, and Vietnam, the likelihood of a firm receiving support was not related to whether it was affected by the crisis. Looking ahead, investment spending can be streamlined and allocated where the social rate of return is highest. Returns are four times higher in countries with better public investment management.
- Second, rather than curtail spending or raise taxes prematurely, governments can credibly commit to future discipline and efficiency-enhancing reforms. Some countries have started drawing fiscal consolidation plans, which involve eventually lowering spending and/or increasing revenues, including through the re-introduction of a fiscal rule. They could also commit to phasing out wasteful and regressive spending. For example, fuel subsidies account for as much as 0.25 percent of GDP in China, 0.30 percent in Indonesia, 0.50 percent in Vietnam, and 1.30 percent in Malaysia. While raising revenue and cutting spending during a crisis are difficult, legislating future reforms may be politically easier—because opposition from vested interests is likely to be weaker when they are benefitting from government support and bailouts.

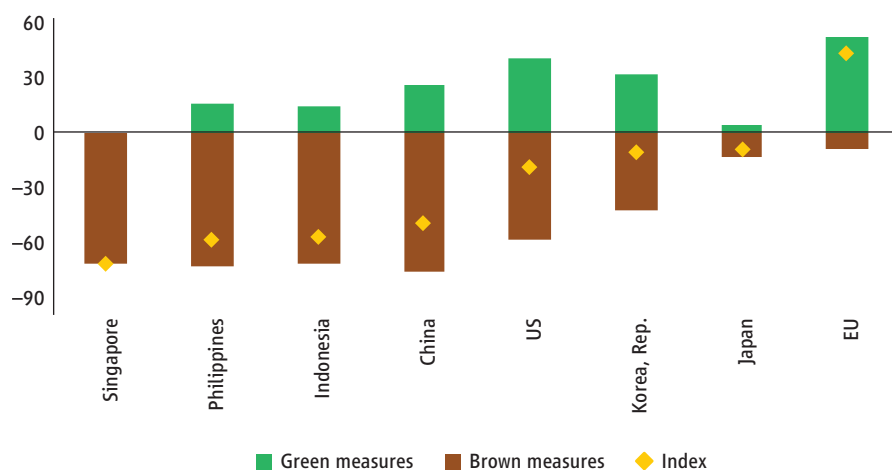
- Third, EAP countries can continue to use monetary policy to share the burden of economic support because their interest rates are positive, reserves requirements relatively high and inflation subdued.
- Fourth, international coordination could magnify the collective impact of fiscal policy because governments tend to under-provide stimulus relative to the global optimum due to demand leakages. China, which has ample fiscal space and a current account surplus, could do more to boost domestic demand. Since returns to public infrastructure investment are declining and corporate debt levels are high, a greater emphasis could be placed on targeted transfers and other fiscal measures to boost consumption. An in light of growing climate risks, public investment to accelerate the transition to a low-carbon development path could have high social returns and also generate short-term employment gains.

Going green without hurting growth or the poor

The developing East Asia and Pacific region is at the frontline of combating global climate change. The region is a major contributor to rising greenhouse gas emissions causing climate change—with emissions tripling since the year 2000 and now accounting for nearly one-third of global emissions. The region also faces the consequences of climate change, from typhoons and tropical diseases to melting glaciers and rising oceans. Therefore, early climate action by the region is both in the global and the region’s own interest. In fact, without early and decisive action and policy shifts in this part of the world, it will be difficult to achieve the reduction in global emissions necessary to get on track toward the 2°C temperature goal of the Paris Agreement.

However, decoupling output growth from emissions will require a transformation in consumption and production patterns on a massive scale. The significant up-front costs involved in mitigation and adaptation measures, the potential impact on energy supply reliability and prices, and the dislocation of capital and labor that will result from the inevitable exit of polluting industries pose constraints that will need to be overcome for the region to move on an accelerated path to a low carbon future. These constraints, as well as the current economic distress and the power of vested interests, may explain why “green” measures are outstripped by “brown” activities in the economic stimulus packages across the East Asia and Pacific region (Figure O8). Looking ahead, the trade-offs between greenness and inclusive growth will become less sharp thanks to technological progress, and that is likely to change the political economy of climate action.

Figure O.8. Recent economic stimulus measures in the EAP region are more brown than green



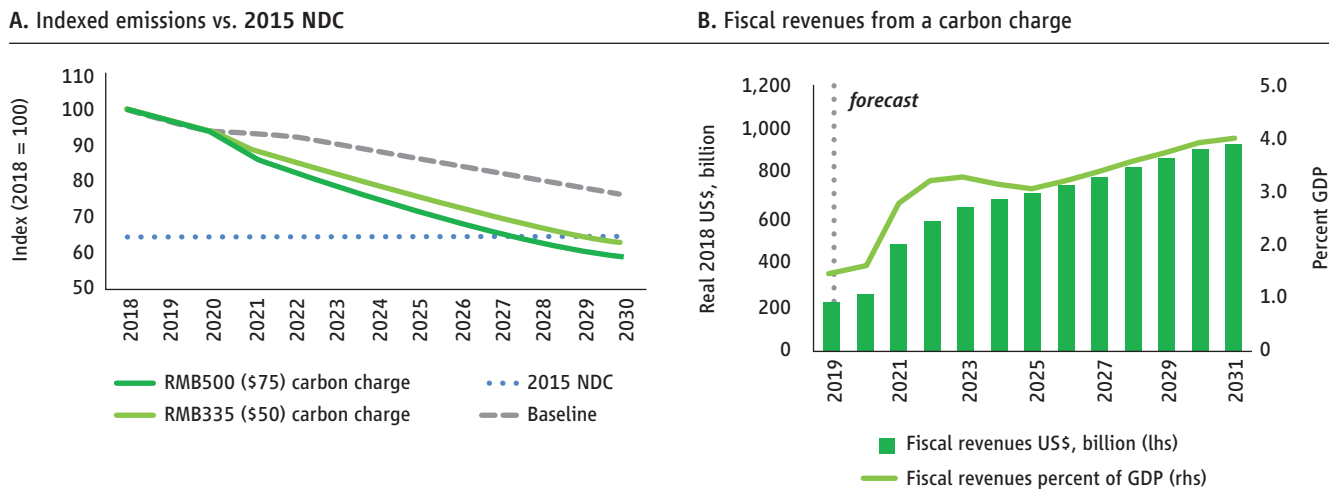
Source: World Bank staff based on Vivid Economics 2021.

Note: The figure provides a broad indicator of trends; it may not capture all green measures or may include some green measures that have not been implemented. The index considers only five sectors because of their historical impact on climate and environment: agriculture, energy, industry, waste management, and transport. Other sectors, such as health and social policy that feature prominently in policy responses are not considered. Within the selected five sectors, the index assigns a “greenness factor” to stimulus measures. This greenness factor is constructed by combining: (i) an assessment of the specific measures announced in the packages using a rating scheme that grades their greenness/brownness; and (ii) a general environmental performance indicator to reflect the broader sector and country contexts (because the greenness of stimulus measures will be affected by the stringency of existing environmental regulations, and other country-sector specific factors). The final index for each country is an average of sectoral impact, normalized to a scale of -100 to 100.

Whether climate and economic objectives are incompatible or mutually reinforcing is in part a question of policy choices (see Table 0.3 at the end of the Overview).

- First, when promoting low carbon and more resilient development, policy makers can rely on a mix of instruments that can drive efficient abatement across the economy. Policy options include: (i) phasing out fossil fuel and energy subsidies, (ii) adjusting carbon prices (Figure O.9), (iii) fostering green public investment in low carbon and resilient infrastructure and innovation, (iv) undertaking low-carbon policy reforms in key sectors, such as energy, transport, agriculture, land use, and urban planning.

Figure O.9. Carbon charges in China could induce significant emission reductions and generate revenue



Source: Simon Black 2020, Fiscal Foundations of Carbon Neutrality, Policy Note.

Notes: NDC = Nationally Determined Contribution. "lhs" refers to left-hand side and "rhs" refers to right-hand side. Based on simulations for China using the Carbon Pricing Assessment Tool.

- Second, policies to engender a low carbon transformation will need to be accompanied by steps to ensure their costs and benefits are distributed fairly, both domestically and internationally. These steps are necessary to ensure broad-based political support and to overcome resistance from vested interests. For instance, recycling revenue generated by carbon pricing back into the economy could help subsidize abatements costs, alleviate negative social impacts, and cut other distortionary taxes on labor, consumption, or profits.
- Third, regional and global cooperation will be important in inducing necessary climate action. Bolder action by China is needed to catalyze cooperation because of the size of its emissions. China must act because of the threat to its people and can act because it has the economic capacity to adjust. Smaller developing countries will, however, need international assistance to take deeper climate action than is nationally optimal—not least because of the persistent global inequities in per capita emissions. For example, Vietnam's revised Nationally Determined Commitment (NDC) aims to reduce GHG emissions by 2030 by 9 percent using domestic resources and by 27 percent with international support. Achieving this goal would require at least \$20 billion more in investment than business-as-usual. In the past two decades, the World Bank provided about \$5 billion financing for energy sector development. The additional assistance that is required would be more effective if complemented by a supportive policy framework. Other forms of mutually beneficially collective action, ranging from diffusion of green technologies to cross-border green investment, will also help but are not likely to be adequate substitutes for meaningful assistance.

Table O.1A. Heterogeneity in COVID-19 transmission and vaccine strategies

Low domestic transmission	China	Gradual implementation to manage risks. Pace not constrained by production.
	Vietnam	Procured some vaccines and has just started vaccination.
	Cambodia	Already administering SINOPHARM (China) vaccine and AstraZeneca (India) vaccine to priority age and high-risk groups
	Lao PDR	Already administering SINOVAR (China) vaccine to medical workers. The goal is to vaccinate 20 percent of population in 2021 and 70 percent by 2023.
	Thailand	Procurement of vaccines has been a challenge.
	Timor-Leste	Support from COVAX and Australia. AstraZeneca vaccine selected, and first vaccination phase planned to start in April.
Intermediate domestic transmission	Malaysia	Range of contracts from 5 manufacturers. Vaccinations started in February. Goal: 80 percent of population by February 2022.
	Mongolia	Started vaccination and plans to complete urban area by end of April and to reach full vaccination by July 1, 2021. Support from COVAX.
	Myanmar	Aggressive vaccination strategy: start by April, goal 40 percent of population in 2021. COVAX support.
	PNG	Planning as much vaccination as possible with support from WHO and Australia.
High domestic transmission	Indonesia	Vaccination of health workers completed and certain other groups started. Goal: coverage of all adults within the next 12 months.
	Philippines	Lagging behind. Concerns about efficacy and safety. First million doses delivered in February and vaccination has recently started.
COVID-19 free	PICs	Delayed rollout of vaccines. Three countries have started vaccination: Republic of the Marshall Islands, Federal States of Micronesia, and Palau.

Note: Based on information as of March 10, 2021.

Table O.1B. Cumulative vaccine administration data

<i>Country</i>	<i>Doses per 100 people</i>	<i>Doses administered (thousand)</i>
Singapore	13.54	792
China	4.51	64,980
Mongolia	4.26	140
Indonesia	2.41	6,580
Korea, Rep.	1.25	641
Malaysia	1.13	367
Cambodia	1.02	171
Lao PDR	0.56	41
Philippines	0.20	216
Myanmar	0.19	100
Thailand	0.08	54
Vietnam	0.02	24
Papua New Guinea	—	—
Pacific Islands	—	—
Timor-Leste	—	—

Source: Our World in Data; Press research.

Note: Based on information as of March 17, 2021. Doses administered included both 1st and 2nd doses: as a result, population coverage should not be understood to mean population fully vaccinated.

Table O.2. Fiscal stance and space in EAP

<i>Country</i>	<i>Fiscal stance</i>	<i>Assessment</i>
China	Significant stimulus but emphasis on production.	Adequate fiscal space but high private and SOE debt.
Philippines	Conservative stance and under-spending due to weak implementation.	Adequate fiscal space but supply problems due to COVID-19 and natural disasters.
Thailand	High support. Risk early unwinding due to conservative stance, complex rules.	Adequate fiscal space but large private debt. Political instability creates growth risks.
Cambodia	Significant support. Less than planned in 2020, but more spending in 2021.	Adequate fiscal space but high private debt and large current account deficit.
Vietnam	Increased spending, mainly via accelerated public investment.	Reasonable fiscal space but high private debt a source of concern.
Indonesia	Significant stimulus but limited by credit rating concerns.	Low revenue and large external financing needs limit fiscal space.
Malaysia	Changed fiscal rules. Generous relief package. Rating agency downgrade.	High public debt, low revenues, and high financing needs limit fiscal space.
Myanmar	Small increase in spending. Increased concessional financing, e.g., DSSI.	Some fiscal space but costly borrowing. Political instability threatens growth.
Timor-Leste	Significant increase in spending, mostly on household support.	Adequate fiscal space owing to Petroleum Fund, but implementation challenges.
Lao PDR	Limited additional support.	Large government debt. Non-concessional borrowing. Fiscally constrained.
Mongolia	Substantial support.	High external debt and commodity dependence limit fiscal space.
PNG	Small fiscal expansion.	High fiscal deficits, government debt, external private debt. Political instability.
PICs	Limited spending relative to needs. Inadequate social protection.	Fiscal constraints. High risk of debt distress. Low growth.

Note: Based on information as of March 10, 2021.

Table O.3. Greening recovery

<i>Country</i>	<i>Policy stance</i>
China	The government recognized the important role of mitigation strategies and is actively discussing them in future growth planning.
Lao PDR	New 5-year plan: from high growth to quality of growth. Risk management, especially of natural disasters like floods.
Mongolia	Mongolia approved new ambitious NDC of 22.7 percent and declared even more ambitious aspirational target of 27.2 percent.
PICs	Adaptation is priority. Disaster preparedness. Not much building back better.
Philippines	Emphasis on adaptation and disaster risk management. A country with high energy and production costs and limited subsidies.
PNG	Adaptation a priority.
Thailand	Few concrete actions.
Timor-Leste	Limited focus on climate issues.
Cambodia	Relatively little emphasis on climate change.
Indonesia	Limited decarbonization measures. Relaxed controls on land use and other environmental safeguards.
Malaysia	Positive signals but emphasis on growth.
Vietnam	Concerns about sustainability but limited emphasis and implementation capacity.

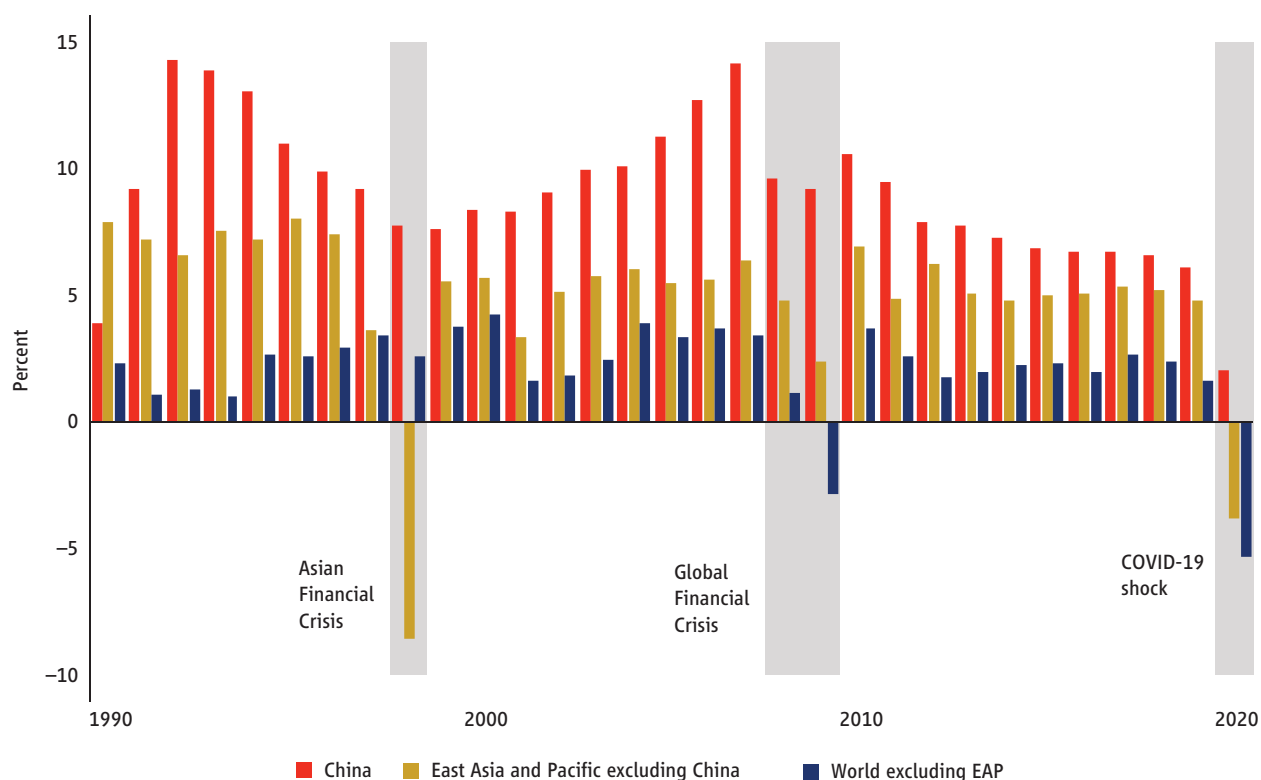
Note: Based on information as of March 10, 2021.

Part I. Recent Developments and Outlook

Growth and Poverty in EAP

COVID-19 caused a global recession whose depth was surpassed over the past century and a half only by the economic contraction during the two world wars and the Great Depression (World Bank 2021). In the *East Asia and Pacific (EAP) region*, as in the rest of the world, the pandemic and the restrictions it provoked inflicted domestic demand and supply shocks. Consumer demand, especially for services products, shrank due to declining incomes and mobility, and investment was dampened by heightened debt and uncertainty. The impact was magnified by negative spillovers from the rest of the world, especially through the contraction of trade and tourism. The cumulative impact of these multiple shocks caused the sharpest decline of growth in the EAP region in decades (Figure I.1). Growth in the region declined to 1.2 percent in 2020 but remained positive while rest of the world contracted by more than 4.0 percent.

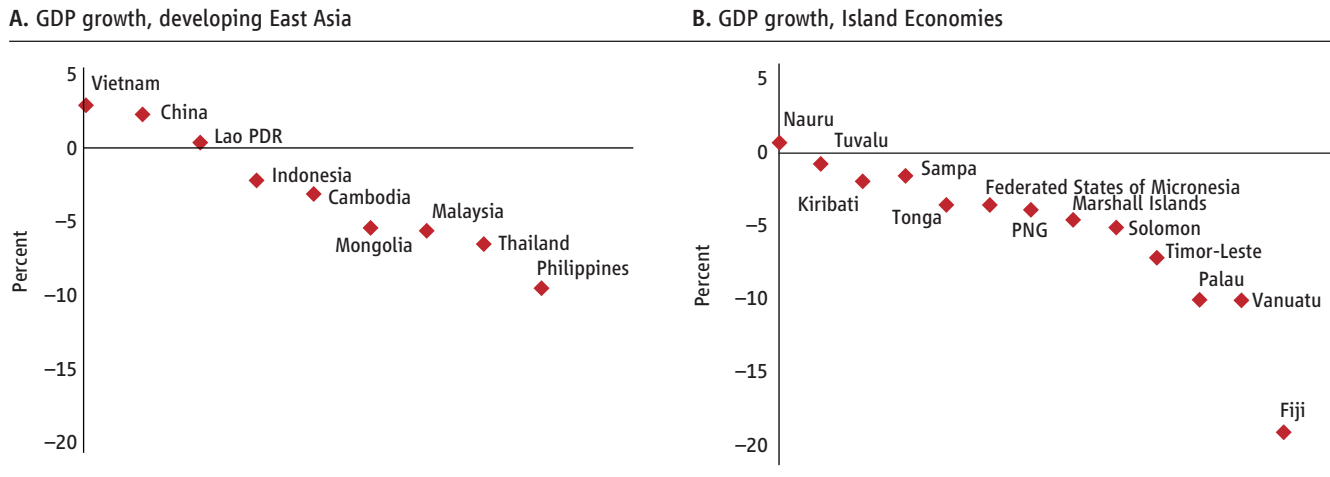
Figure I.1. Regional growth declined sharply following the COVID-19 shock but less than global growth



Sources: Haver Analytics; World Bank.
 Note: Year-on-year change of real GDP in 2015 prices. Figure I.1 presents latest estimates for the year 2020. EAP: East Asia and the Pacific.

The relatively positive performance of the EAP region was driven primarily by China which grew by 2.3 percent (Figure I.2). Even the decline in growth compared to 2019 was smaller in China (less than 4 percentage points), compared to the rest of the region (nearly 9 percentage points). Of the other countries in the region, only Vietnam, Nauru, and Lao PDR grew in 2020, albeit at rates lower than the pre-2020 trends. Output in the rest of the region contracted by an estimated 3.8 percent in 2020, with contractions ranging from negative 0.5 percent in Tuvalu to the precipitous negative 19 percent in Fiji.

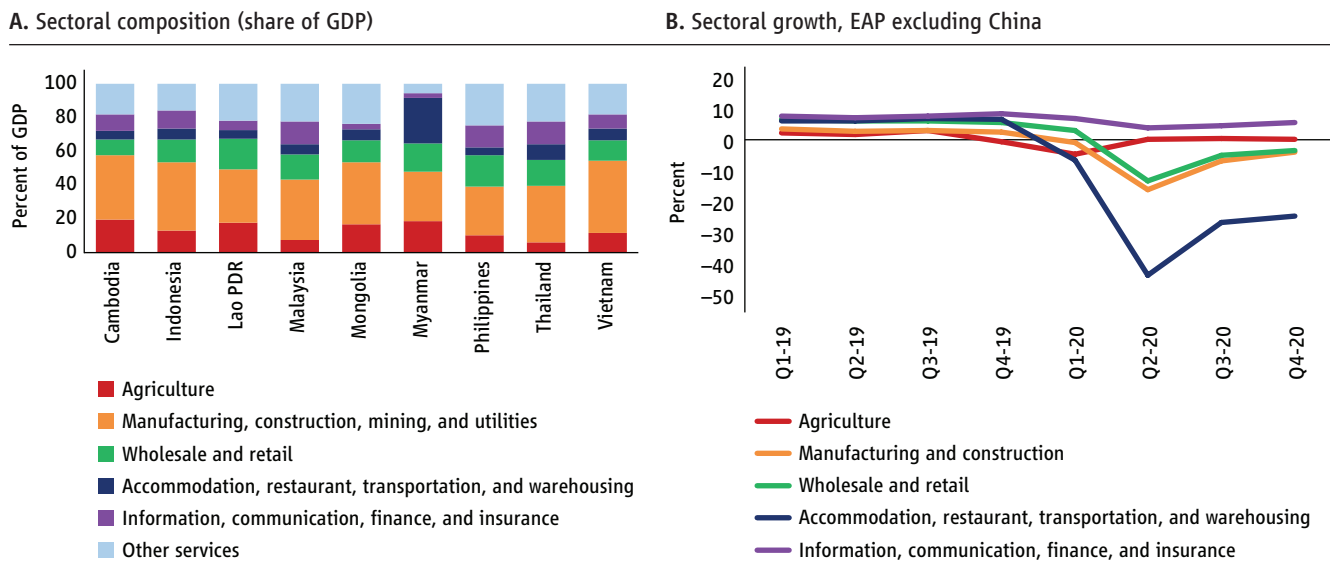
Figure I.2. The impact of COVID-19 on the region’s economies was uneven



Sources: Haver Analytics; World Bank.
 Note: Year-on-year change of real GDP in 2015 prices. Figure I.2 presents latest estimates for the year 2020.

COVID-19 and related shutdowns have had a predictably *uneven economic impact across sectors* within each economy. Agriculture has been relatively resilient in the face of the COVID-19 shock (Figure I.3). Manufacturing contracted significantly but appears to have almost recovered. Services sectors show interesting heterogeneity: value added in accommodation, restaurants, and transport has plummeted; wholesale and retail have tracked manufacturing; and information, communication, and finance have grown steadily. The sectors that have still not recovered constitute a substantial share of value added in most of the economies of the region.

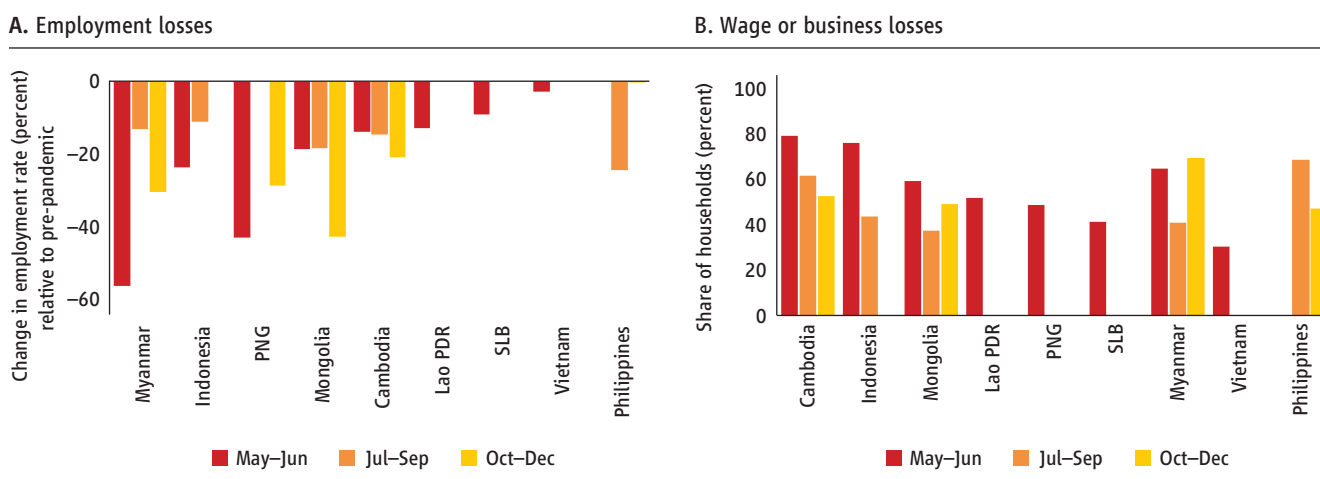
Figure I.3. The economic impact has been uneven across sectors



Source: Haver Analytics.
 Note: Year-on-year growth.

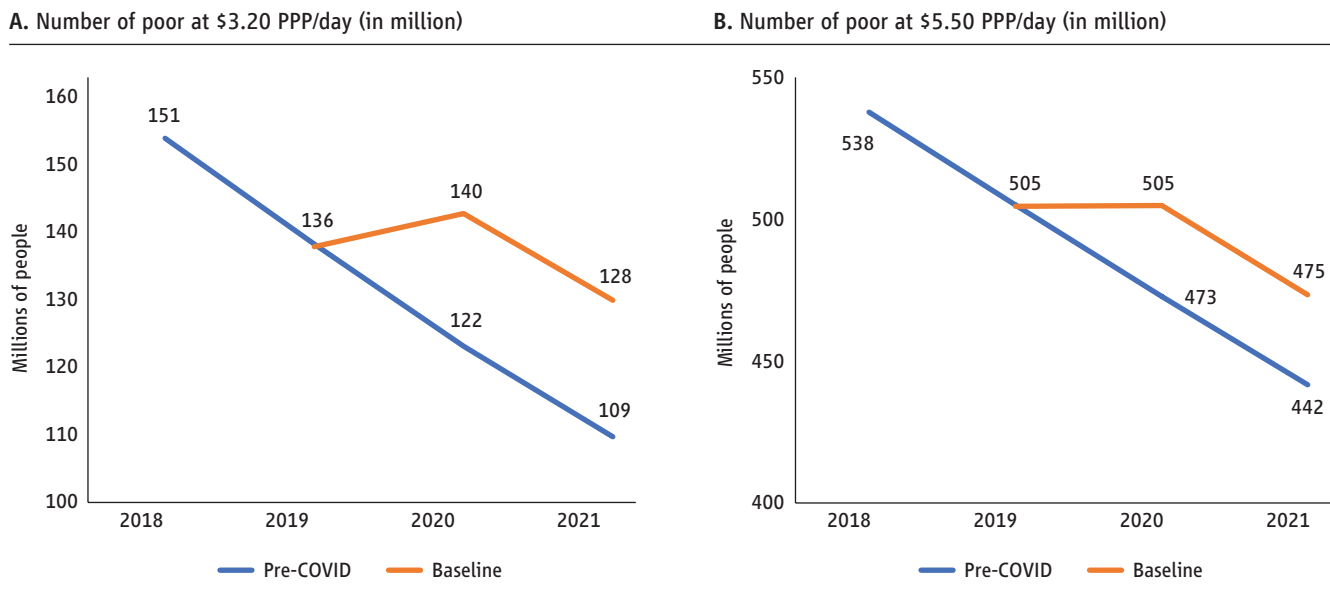
The slowdown in growth in some countries and contraction in others were associated with a *reduction in employment and earnings*. The limited high-frequency data available for a few countries reveals that as countries relaxed their lockdowns over the summer, employment and earnings generally improved, but not enough to offset the earlier declines (Figure I.4). Employment and earnings took a renewed hit in some countries toward the end of 2020 with the re-introduction of restrictions provoked by new outbreaks of the disease. In addition to hurting incomes, COVID-19 has affected well-being of households, especially for those in the services sector, low-income households, and women (see Box I.1).

Figure I.4. Employment and income losses have been substantial and have recently increased in several countries



Source: World Bank High-Frequency Household Phone survey.
 Note: Employment change defined as the ratio of employment rate at the time of the survey relative to the employment rate prior to the pandemic. All surveys are from 2020 and timings are as follows: Myanmar (May, Aug, Oct); Indonesia (May, Jul); PNG: Papua New Guinea (Jun-Jul); Mongolia (May-Jun, Sep, Nov-Dec); Cambodia (May, Aug, Oct); Lao PDR (Jun-Jul); SLB: Solomon Islands (Jun); Vietnam (Jun-Jul); Philippines (Aug, Dec-Jan).

Poverty reduction in East Asia and Pacific stalled in 2020 for the first time in 20 years. Because most countries in the region saw incomes decline, the number of poor is estimated to have increased—under the lower-middle-income (\$3.20 PPP/day) poverty class line (the number of poor under the upper-middle-income [\$5.50 PPP/day] poverty class line remained the same). Considering also those that would have escaped poverty in the absence of the pandemic, estimates suggest an additional 32 million poor at the \$5.50 PPP/day line than previously expected (Figure I.5). As the economies in the region recover in 2021, poverty reduction is expected to resume, albeit at a slower pace than was anticipated pre-COVID-19. As a result, the number of poor for 2021 is projected to be up to 19 million (at \$3.20 PPP/day) and 29 million higher (at \$5.50 PPP/day) than in the absence of the COVID-19 crisis.

Figure I.5. Poverty in East Asia and the Pacific rose in 2020 for the first time in 20 years

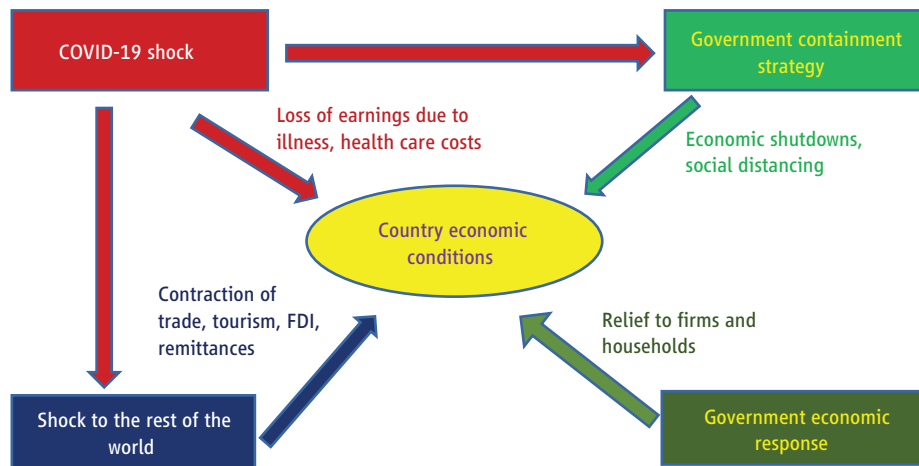
Source: World Bank staff estimations. Poverty estimates are based on growth forecasts, population projections, and historical growth elasticities of poverty.

Note: The baseline forecasts are as of March 3, 2021. US\$3.20 per-person-per-day and US\$5.50 per-person-per-day poverty lines (2011PPP) represent the typical value of poverty lines found in lower middle-income and upper middle-income countries, respectively (World Bank, 2018b).

What Explains the Uneven Economic Performance?

Economic performance across countries continues to depend on (i) the efficiency with which the virus is contained; (ii) the ability to take advantage of the revival in international goods trade; and (iii) the capacity of governments to provide fiscal and monetary support (Figure I.6). Our econometric analysis (Box I.1) suggests that the countries with relatively weak performance were the ones that suffered high rates of COVID-19 infections and mortality (e.g., Indonesia); that relied more on prolonged restrictions on mobility rather than an effective test-based strategy (the Philippines); that depend on earnings from tourism (the PICs) rather than exports of manufactured goods, especially electronics (China, Malaysia, Vietnam); and whose governments had limited fiscal space (some PICs). In a few countries, the negative consequences of COVID-19 shock have been exacerbated by country-specific factors—*natural disasters*, including tropical cyclones Harold, Yasa, and Ana in Fiji, a severe drought in Thailand, and typhoon Goni in the Philippines, *policy uncertainty*, in Malaysia, Myanmar, Papua New Guinea, Thailand, and Timor-Leste.

Figure I.6. COVID-19 has hit countries with direct and indirect shocks which governments have been trying to mitigate



Source: World Bank staff elaboration.

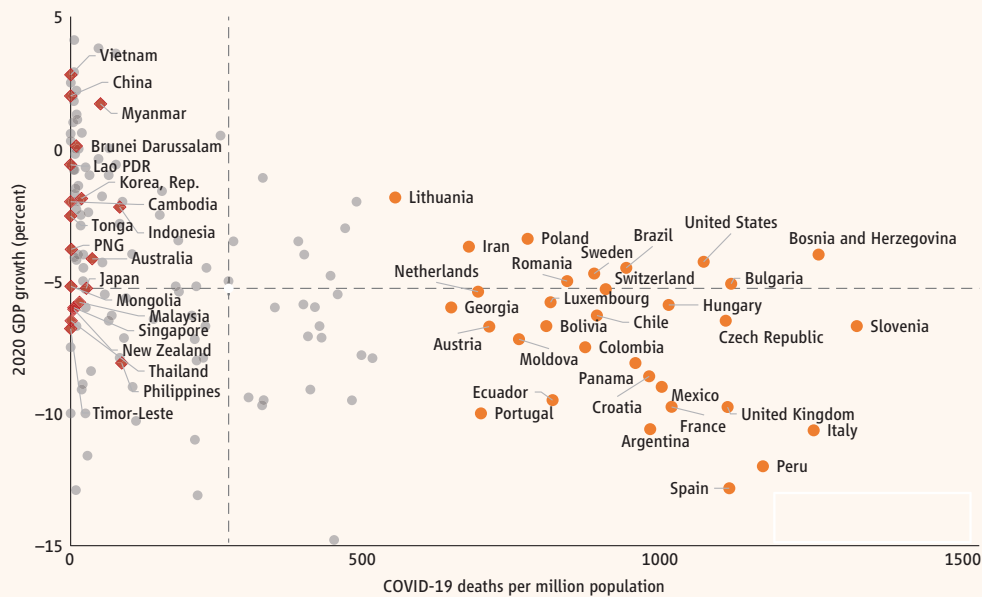
Box I.1. Lockdowns saved lives but hurt livelihoods; testing saved both

Early in the pandemic, the trade-off between lives and livelihoods received significant attention. But many countries that suffered above-average mortality rates (right quadrants) reported above-average growth contraction (lower quadrants) (Figure I.B1.1). This group consists mostly of larger industrial and South American countries. Relative to the rest of the world, the mortality rates in the EAP countries (red diamonds) are modest. However, there is significant variation in economic performance in the region. Among developing EAP countries, China and Vietnam are among a few nations reporting positive economic growth in 2020. Cambodia, Indonesia, Lao PDR, Papua New Guinea, and Tonga are countries that suffered relatively modest economic impacts. Mongolia, Malaysia, Thailand, Philippines, and Timor-Leste documented above-global-average economic contraction.

The association between the COVID-19 infection rate and the policy responses is assessed using daily data for 174 countries for the period January 1–December 31, 2020. A panel data regression is used with a country- and time-fixed effect model. The results show that the introduction of public health measures including both open testing and mobility restrictions—and economic support measures are positively correlated with a slower growth of COVID-19 infection cases with respect to what would have been without the policy responses in a country (Figure I.B1.2, Panel A). The containment effects are magnified when policy measures are implemented sooner (i.e., with greater lags).

(continued)

(Box I.1. continued)

Figure I.B1.1. Saving livelihoods is associated with saving lives

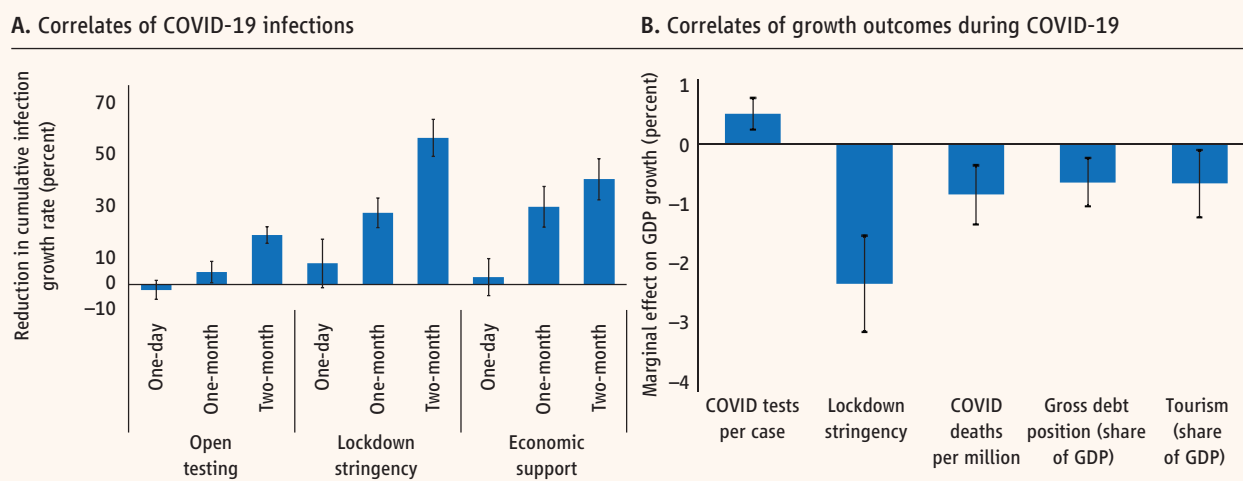
Sources: World Bank staff calculations. World Bank Economic Monitoring; World Economic Outlook; Oxford Covid-19 Government Response Tracker 2020.

Note: GDP growth (y-axis) are annual 2020 forecast obtained from Global Economic Prospect and World Economic Outlook. Mortality rate (x-axis) is calculated as the number of COVID-19–related deaths reported per one million population in 2020. Quadrants are classified by the mean thresholds of global GDP growth (y-reference line) and mortality rate (x-reference line). Red squares represent EAP countries. Orange dots represent countries suffering significant mortality (above 500 per million).

Quarterly panel data estimation also helps disentangle the drivers of economic growth during the COVID-19 shock. Panel B in Figure I.B1.2 assesses the relevance of four country-specific factors that could have impacted growth: (i) the severity of the COVID-19 virus in a particular country, measured by the number of COVID-19 infected cases per million population (infection rate); (ii) the policy response, including containment measures such as the degrees of mobility restriction and testing; (iii) the capacity to provide fiscal support, proxied by country's gross debt position; and (iv) the exposure to the global recession, proxied by the country's dependence on tourism. The results show that countries that experienced greater quarterly growth contraction in 2020 had higher infection rates, imposed more stringent mobility restrictions, had more highly indebted governments, and were more dependent on earnings from tourism (Figure I.B1.2, Panel B; Table I.B1.1). Specifically, on the relationship of disease and growth, on average, every ten less infected cases per thousand population in 2020—equivalent to a sixth of the infection rate in the United States—is associated with half a percentage point increase in annual output growth. These estimates offer a rough measure of the economic benefits of COVID-19 control measures, such as testing and vaccinations.

Across the two panels, lockdowns and mobility restrictions can be seen as effective policy measures to contain the spread of the disease (Panel A), but they entail a substantial cost to economic growth (Panel B). On average, reducing the average daily lockdown stringency by ten index points—a fifth of the world's median daily stringency score in 2020 (52)—would boost GDP growth by approximately one percentage point. In contrast, open and comprehensive testing policies are positively associated with both containment and growth outcomes, even after controlling for the level of mortality rate and the stringency of lockdowns. On average, every one thousand additional tests per positive case is associated with a one percentage point increase in output growth. More testing may have infused greater confidence in people to step out and engage in economic activity. Thus, the lives vs. livelihoods trade-off is associated with lockdowns; testing saves both lives and livelihoods.

(continued)

Figure I.B1.2. Determinants of disease containment and growth: synergies and trade-offs

Sources: World Bank staff calculations based on data from the World Development Indicators, Global Economic Monitoring, Europe CDC, and Oxford Covid-19 Government Response Tracker 2020.

Note A: The figure presents point estimates from daily regression from January 1–December 31 2020, of cumulative growth rate in new cases, standardized as a unit of deviation from the global mean, on open testing policy (constructed as a binary indicator which equals 1 if testing is open and available to all, and 0 otherwise), lockdown stringency index (rescaled from [0–100] to [0–1] for chart representation), and economic support index (rescaled from [0–100] to [0–1] for chart representation). The model controls for country and day fixed effects. Three separate whiskers represent 95 percent confidence intervals of the estimates.

Note B: The sample is a quarterly panel consisting of 78 countries with available quarterly GDP data for the first three quarters of 2020 and 56 countries with available 2020-Q4 GDP. The dependent variable is year-on-year quarterly GDP growth. All quarterly explanatory indicators—tests per case, lockdown stringency, and deaths per million—are standardized and expressed in unit of standard deviation from global mean for each quarter. Gross debt position and tourism are annual measures at baseline (2019), also standardized and expressed in unit of standard deviation from global mean. Quarterly lockdown stringency measure is constructed as an aggregation of daily stringency index values. Bar heights represent the sizes of the estimated coefficients. Whiskers represent 90 percent confidence intervals.

Table I.B1.1. Variation in growth and determinants of growth across EAP countries

Determinant	Output	COVID suffering	Public health policy responses		Domestic exposure	Fiscal capacity
Proxies	2020 GDP growth	deaths per million	Tests per case	Stringency Index (average)	Tourism (% of GDP)	Gross debt position (% of GDP)
Cambodia	-3.1	0	897	38	16	32
China	2.3	0	1,853	68	0	62
Fiji	-19.0	3	240	51	30	84
Indonesia	-2.1	81	6	54	2	39
Lao PDR	0.4	0	2,080	35	5	60
Malaysia	-5.6	15	244	54	6	68
Mongolia	-5.4	1	1,180	58	4	60
Myanmar	1.7	49	336	60	3	42
Philippines	-9.5	84	17	66	3	49
PNG	-3.8	1	47	43	0	47
Thailand	-6.1	1	880	46	13	50
Timor-Leste	-7.3	0	382	32		12
Tonga	-1.5	0		40	10	42
Vietnam	2.9	0	4,277	57	4	47
EAP median	-4.0	4	113	50	3	47
World median	-5.2	81	48	52	3	62

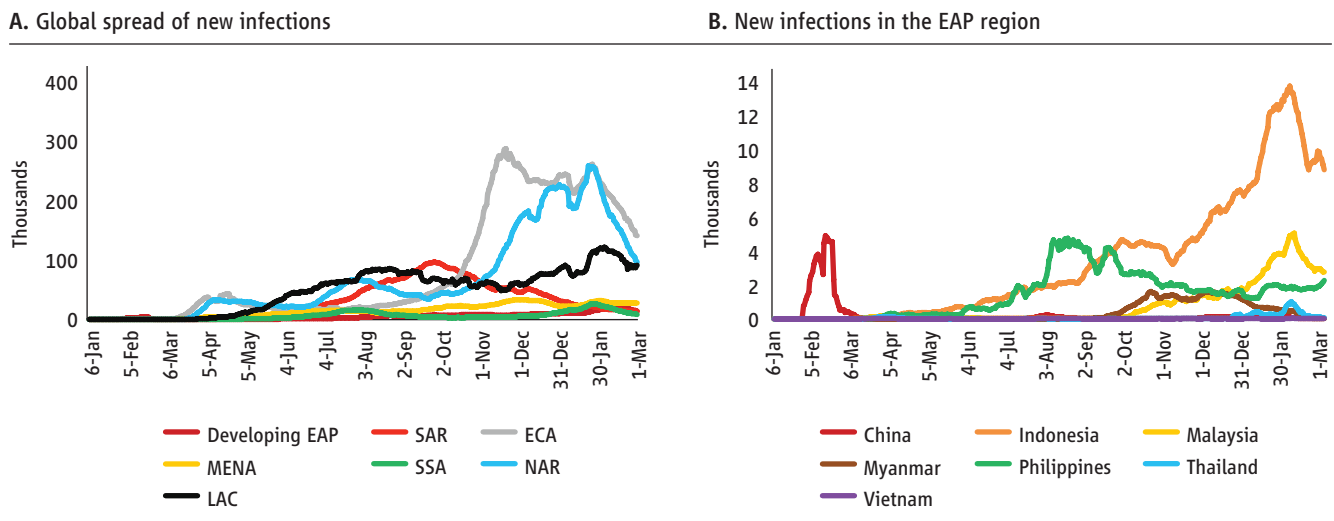
Sources: World Bank staff calculations based on data from World Development Indicators, Global Economic Monitoring, Europe CDC, and Oxford COVID-19 Government Response Tracker 2020.

Note: The ordering of Red-Yellow-Green represents lower output loss, lower COVID-19 suffering, higher tests per case and lockdown stringency, lower dependent on tourism, and lower gross debt position. Deaths per million, tests per case, and lockdown stringency scores (aggregate of daily indices) are cumulative indicators as of the end of 2020. Tourism and gross debt position (as shares of GDP) are 2019 measures.

The COVID-19 shock

After a devastating year, the number of new registered cases is declining in many regions, as populations have developed some immunity and non-Pharmaceutical Interventions (NPIs), such as masks, social distancing, and testing have had an impact. But a growing risk is the emergence of new virus variants, some of which are more infectious and showing signs of resistance to vaccines (Part II.A). Many EAP countries have been relatively successful in containing the spread of the virus. However, the number of new cases is still high in Indonesia, Malaysia and the Philippines (Figure I.7). Other countries in the region have also experienced sporadic local spikes in the number of new cases (Cambodia, Mongolia, Thailand).

Figure I.7. One year into the pandemic, the number of new infections is beginning to decline, but remains high in several countries including Indonesia, Malaysia, and the Philippines

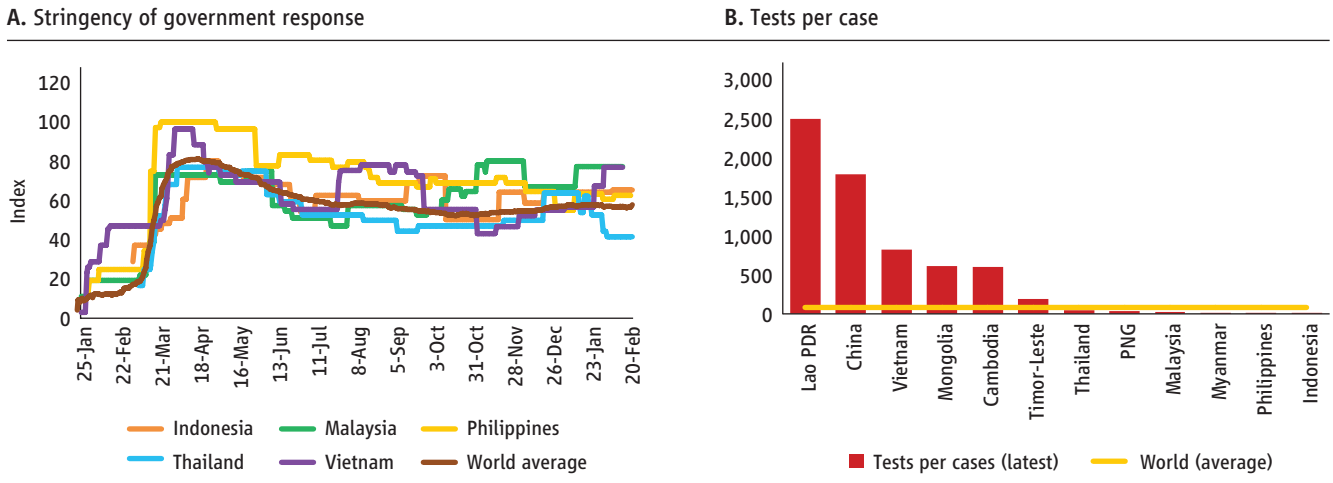


Source: Johns Hopkins University, Center for Systems Science and Engineering COVID-19 Dashboard.

Note: Regions include Advanced Economies, EAP, ECA, LAC, MENA, SAR, and SSA refer to, respectively, East Asia and Pacific, Europe and Central Asia, Latin America and the Caribbean, Middle East and North Africa, South Asia, and Sub-Saharan Africa. B shows 7-day sum of cases by date of case reporting.

Early recourse to mobility restrictions in several EAP countries combined with an effective testing-based strategy helped to suppress the virus (Figure I.8). Testing allowed identification of new cases, contact tracing and isolation, thus helping to suppress the virus. Tests per case appear to have been high compared to the global average in countries that were able to contain the virus (Cambodia, China, Lao PDR, Mongolia, Vietnam), and lower than the global average in countries that struggled with high number of new cases and renewed outbreaks (Indonesia, Malaysia, Myanmar, the Philippines).

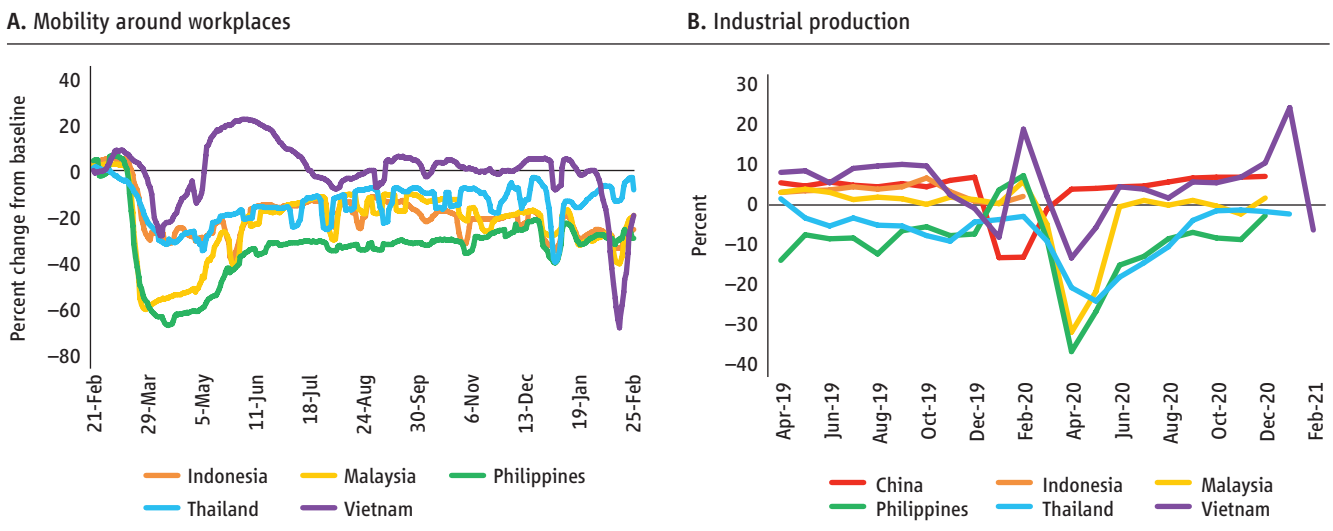
Figure I.8. Countries in the region that have contained the virus appear to have administered a higher ratio of test per case



Source: Johns Hopkins University, Center for Systems Science and Engineering COVID-19 Dashboard.
 Note: Stringency Index is an aggregate policy score based on the number and strictness of government policies, collected by the Oxford COVID-19 Government Response Tracker (OxCGRT). 0 to 100, 100 = strictest. Last observation is February 28, 2021.

High-frequency indicators show that mobility around the workplace remained subdued in most of the economies of the region. It had returned to pre-COVID-19 levels only in Vietnam, but recently saw a dip again (comparable mobility data for China is not available). Industrial production in China and Vietnam has been increasing strongly during the second half of the year but plunged recently in Vietnam (Figure I.9).

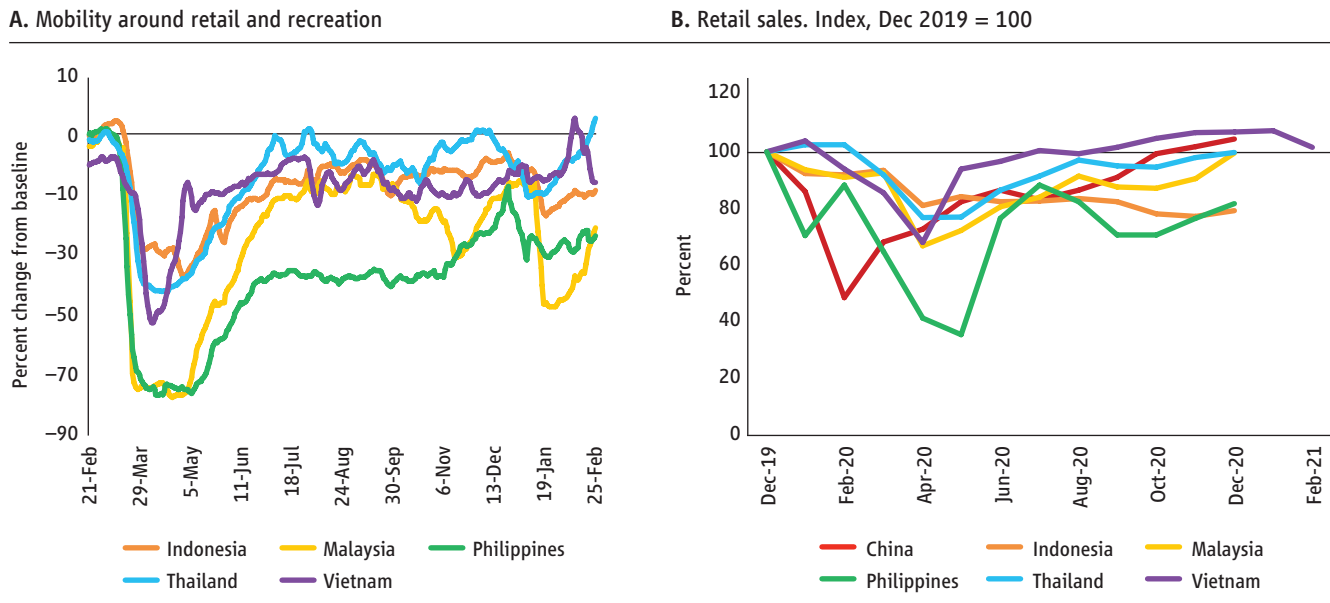
Figure I.9. The COVID-19 induced restrictions on work mobility are disrupting production



Source: Haver Analytics; World Bank.
 Note: A. Baseline refers to pre-COVID-19 levels. B. Year-on-year change. Constant 2010 USD prices, seasonally adjusted.

Mobility around retail and recreation also remains below pre-COVID-19 levels in all the countries. Retail sales have been increasing in China and Vietnam, surpassing pre-COVID-19 levels at the end of the year for both countries, but remain below pre-COVID-19 levels in the region's other economies. A rise in infections by the end of the year corresponded to a slowing momentum of retail sales in Indonesia, the Philippines, and Vietnam (Figure I.10).

Figure I.10. The restrictions on retail mobility are constraining retail sales



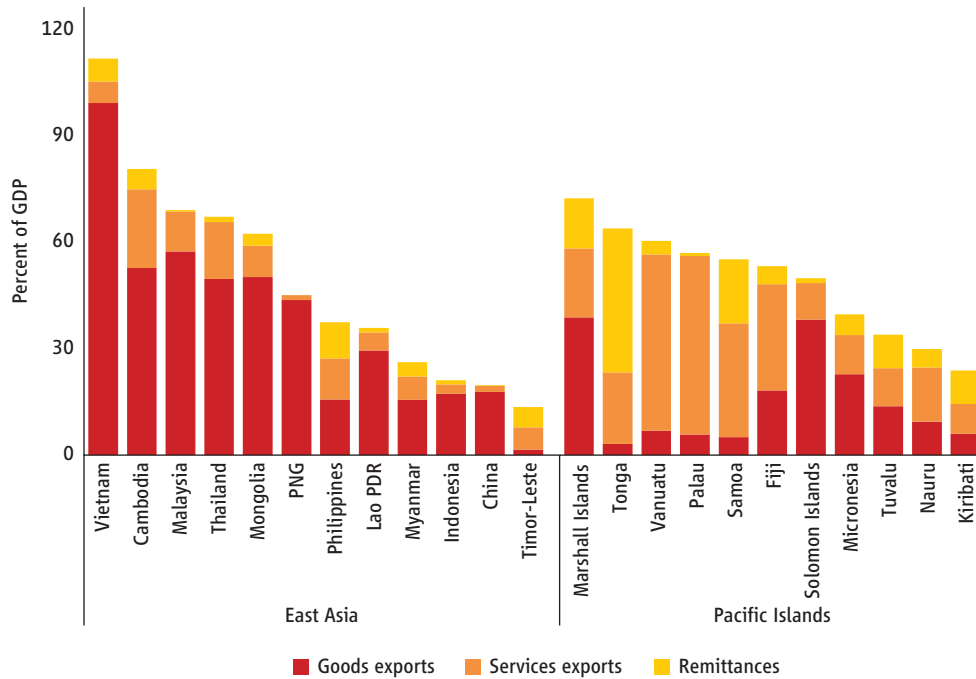
Sources: Haver Analytics; Google Mobility Reports.

Note: A. Relative volume of direction requests compared to a baseline volume on January 13th, 2020. Last observation is February 26, 2021.

Exposure to a world in recession

The EAP countries are exposed to the world economy through flows of goods, services, labor, and capital (Figure I.11). Vietnam stands out in terms of the share of exports in GDP, though the share is only half as large when expressed in value added terms to adjust for the importance of imported inputs. Cambodia, Malaysia, Mongolia, and Thailand economies are also highly reliant on goods exports. China's dependence on exports has halved since 2006 to only about 18 percent of GDP, comparable with the relatively low exposure of Indonesia. The Philippines, Thailand, and most Pacific Island economies depend more on services exports and are more exposed to travel disruptions.

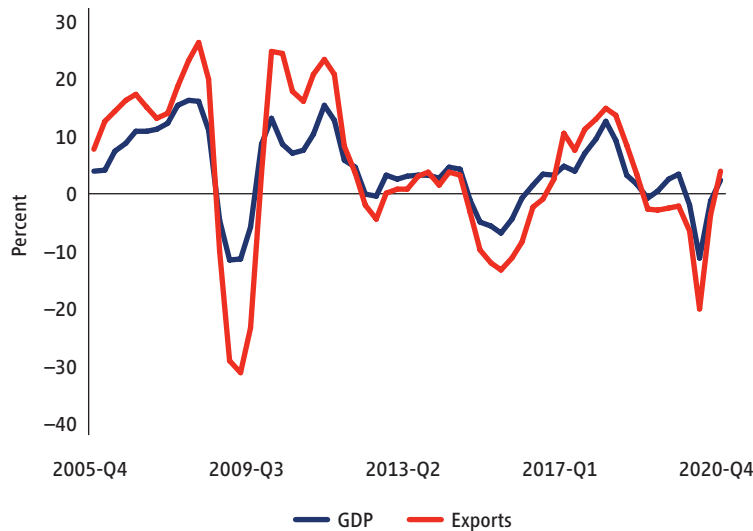
Figure I.11. EAP countries have strong links to the rest of the world through flows of goods, services and labor



Source: World Bank.
 Note: Unweighted average over 2017–19 period or three latest years available.

Following a sharp decline in early-2020, global trade has been experiencing a rebound. Trade fell less relative to GDP than in the great recession, but from a lower growth rate than before the Global Financial Crisis (Figure I.12). The volume of global goods trade surpassed its end-2019 level for the first time in November, mirroring an ongoing recovery in global industrial production. Recent high-frequency data, such as the global new manufacturing export orders Purchasing Managers Index (PMI) hovering close to 50 in the first quarter of 2021, the value separating expansion from contraction, however, suggest that goods trade growth has slowed in 2021 amid the renewed mobility restrictions.

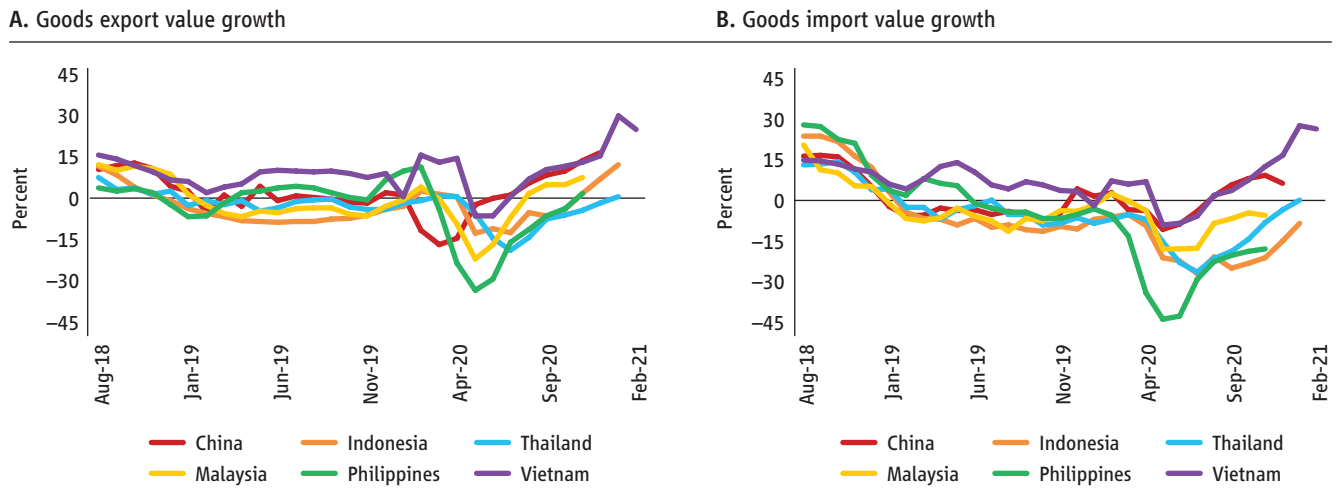
Figure I.12. Trade fell less relative to GDP than in the great recession and is beginning to recover



Source: Haver Analytics.
 Note: Growth in global export values and nominal GDP.

Regional exports are recovering faster than regional imports, reflecting the revival of production and weak domestic demand. While China was the first country to experience a sharp export decline, it was also the first one to recover strongly (Figure I.13). Among the major EAP exporters, Vietnam's exports were the most resilient in terms of a smaller initial decline of 7 percent in the second quarter and a sharper subsequent rebound where exports grew by 15 percent in the fourth quarter as compared to the last quarter of 2019.

Figure I.13. Regional exports are recovering faster than regional imports, perhaps reflecting the revival of production while domestic demand remains weak

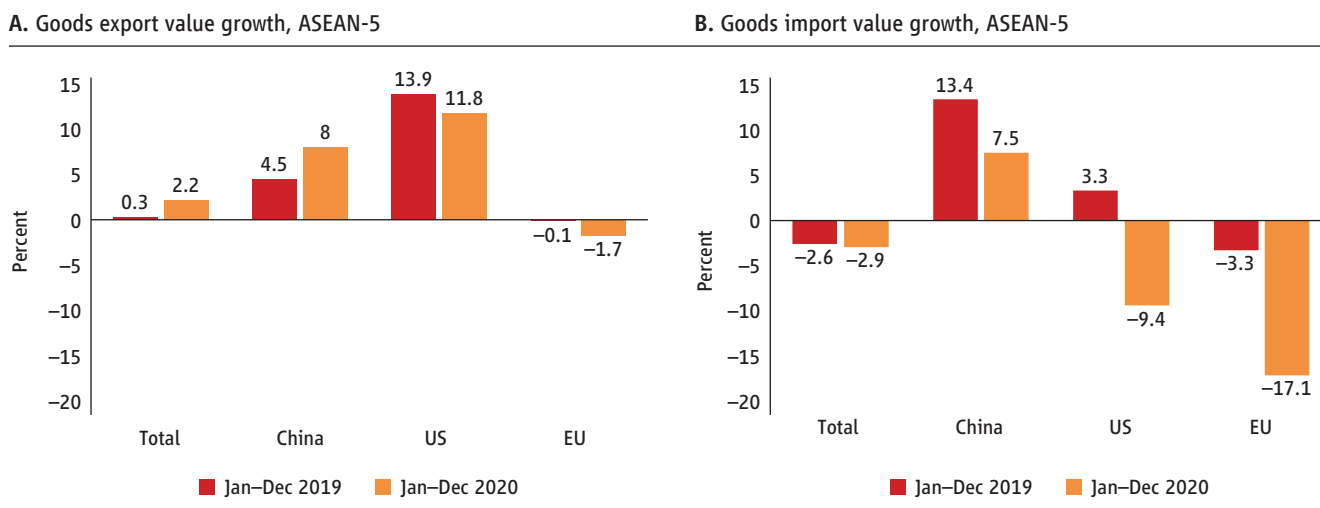


Source: Haver Analytics.
Note: Year-on-year growth, 3-month moving averages.

• What explains export performance?

The reason for strong export performance was, first, faster recovery in some countries in the EAP region than in rest of the world, because COVID-19 came earlier to the region and was contained faster by these countries. The second reason was the faster recovery of production than consumption in the region compared to the rest of the world. That is also the reason why imports contracted more sharply and recovered more slowly than exports. In the case of China, and possibly Vietnam, this asymmetric recovery was in part attributable to stronger state support for firms than households (see Box 1 in the EAP Economic Update Fall 2020). One result has been faster growth of EAP exports to the US than to China and faster growth of imports from China than from the US (Figure I.14). In effect, the US has supported external demand for ASEAN-5 economies.

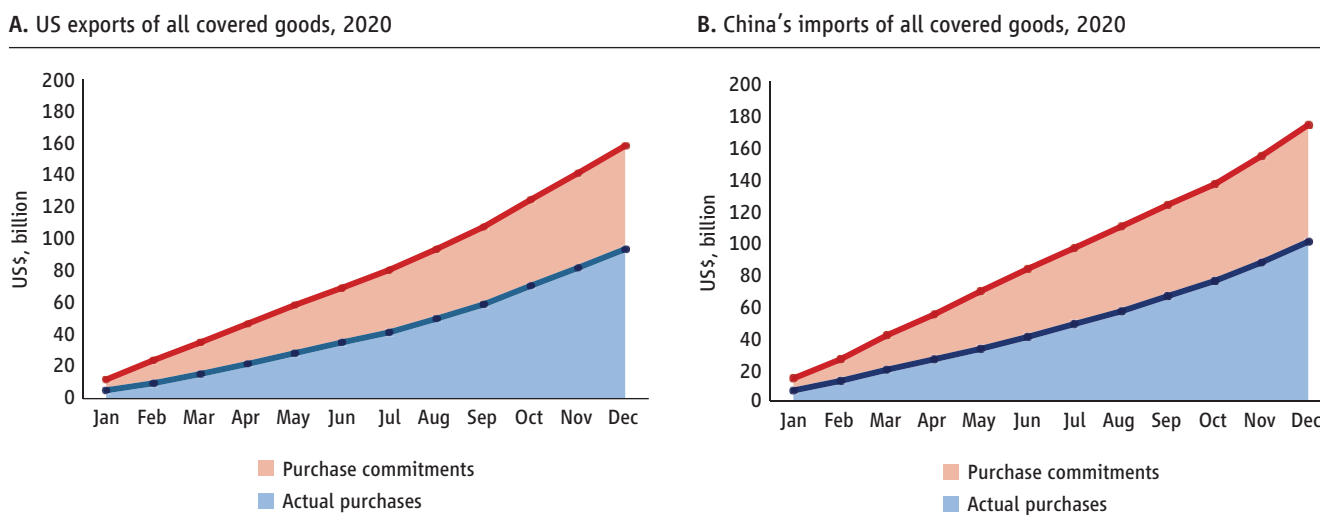
Figure I.14. The faster recovery of production in the region compared to the rest of the world has meant faster growth of exports to the US than to China and faster growth of imports from China than from the US



Source: Trade with China, US and EU from country-specific customs.
 Note: Total merchandise exports. ASEAN-5 includes Indonesia, Malaysia, Philippines, Thailand and Vietnam. EU represents 27 European Union countries.

The two reasons mentioned above—earlier recovery in the EAP and firm-oriented support—also explain in part why China fell short by more than 40 percent of its 2020 purchase commitments under the US-China Phase One trade deal (Figure I.15).

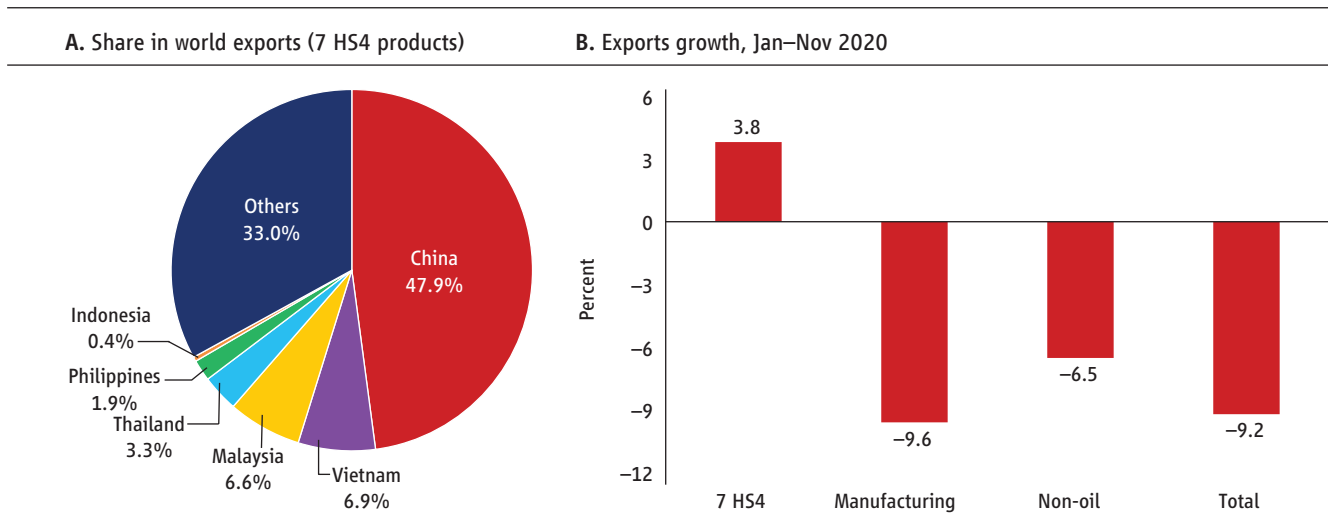
Figure I.15. During 2020, China fell short of its purchase commitments



Source: World Bank staff illustrations using data from Bown (2021)

The third reason for strong export performance is the nature of the shock and its differential impact on trade in different types of products. Whereas a crisis like the Global Financial Crisis led to a contraction in the demand for consumer durables, the pandemic-induced lockdowns and remote working led to an increase in demand for computers, home entertainment devices, and kitchen equipment as well as the intermediate products that feed into these devices. Exports of the seven HS4 digit machinery and electrical equipment products that are among the top 5 exports of the large EAP countries grew by 4 percent over the last year, even as total exports contracted by 9 percent (Figure I.16).

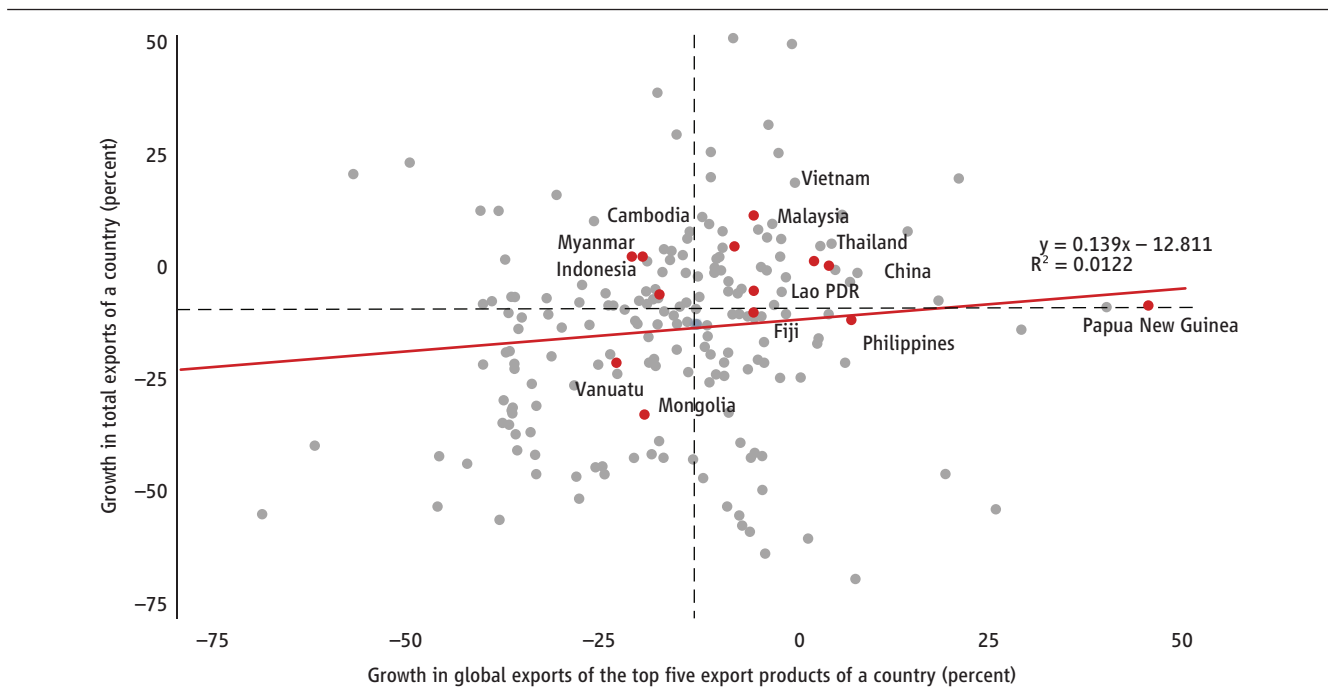
Figure I.16. The categories of machinery and electrical equipment in which EAP countries specialize and account for a large share in world trade saw positive trade growth even as trade as a whole shrank



Source: US, EU, and Japan customs administrations.
 Note: A. Data are for year 2019. B. Year-on-year. 7 HS4 products are Computers (8471), Office Machinery Parts (8473), Telephones (8517), Broadcasting Equipment (8525), Semiconductor Devices (8541), Integrated Circuits (8542), Insulated Wire (8544).

Overall, the change in world demand for top exporting products was correlated with high aggregate export growth (Figure I.17). Interestingly, the EAP countries were among the countries that saw positive change in world demand for their exports, which would in part explain a smaller initial decline and a sharper recovery in the region’s exports. Countries like China, Thailand, and Vietnam did not simply ride the wave of sustained demand for their exports, but increased their share in world exports of these products, which could reflect their stronger relative productivity, and increased share of these products in their own exports, which could reflect greater adaptability.

Figure I.17. Some countries may have benefitted from robust global demand for the products in which they specialize

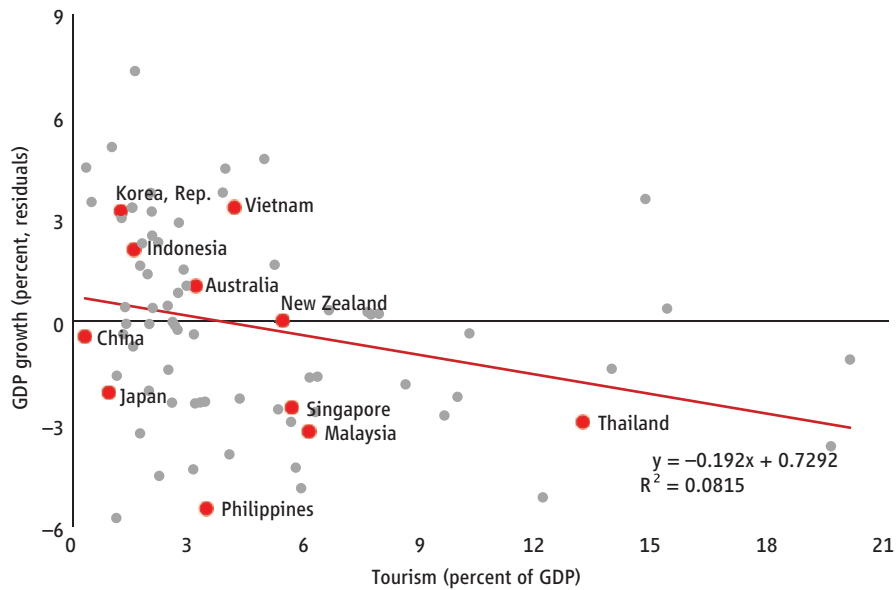


Source: US, EU, and Japan customs administrations.
 Note: The scatter plot shows the relationship between the global demand increase in each country’s top five exported products (rank based on 2019 data) and that particular country’s aggregate export growth.

• **Tourism**

While trade specialization in certain categories of manufactured goods alleviated economic pain during the COVID-19 pandemic, specialization in tourism exacerbated difficulties. The pandemic caused the largest downturn in the tourism industry in recent memory (World Bank 2020a). The persistent restrictions on, and fear of, travel continue to weigh on flows, hurting especially the tourism-dependent economies (Fiji, Palau, Thailand, Vanuatu). Tourism-related industries, and households that depend on them, have borne the brunt of the pandemic. The economies of tourism-dependent countries have experienced the sharpest contractions (Figure I.18).

Figure I.18. Tourism-dependent economies experienced the sharpest contractions or lower economic growth during 2020



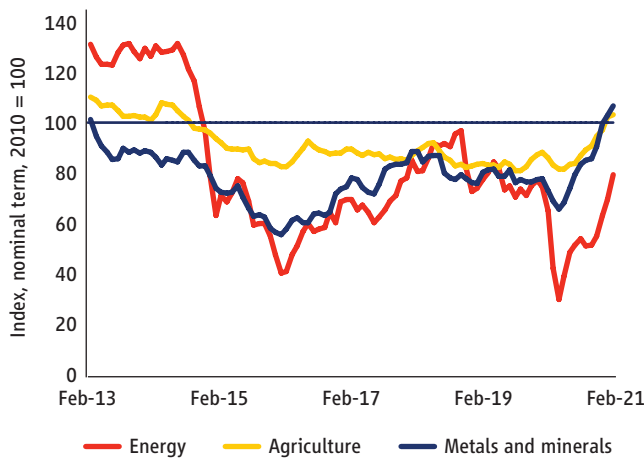
Source: World Development Indicators and Johns Hopkins University, Center for Systems Science and Engineering COVID-19 Dashboard.
 Note: The chart shows conditional correlation between GDP growth in the first three quarters of 2020 (vertical axis) and baseline output share of tourism (2019). GDP growth's residuals are obtained after controlling for the 2020 first three quarters' (i) stringency of lockdown (cumulative stringency index scores), (ii) cumulative test per case, and (iii) COVID-19 mortality rate, 2019 GDP per capita, and average 2014–2019 GDP growth. Red dots represent EAP countries. Blue line shows linear fitted curve.

• **Commodities**

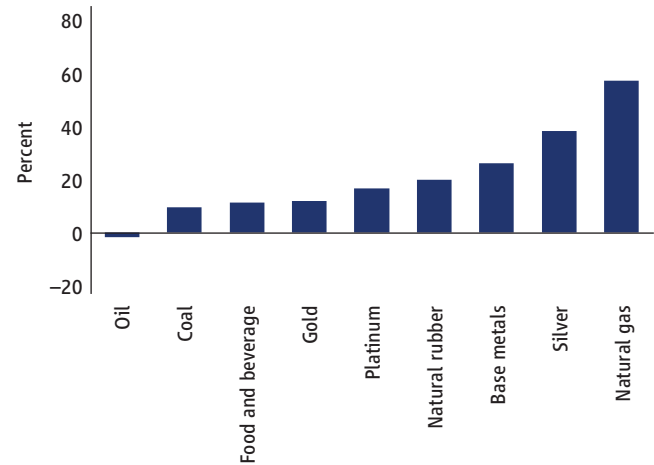
Some regional commodity exporters have benefitted from increasing industrial commodity prices and stable agricultural prices. Metals prices—a bellwether of global industrial activity—rebounded in the second half of 2020 and are now more than 20 percent above pre-pandemic levels, reflecting in part a rebound in Chinese demand for stockpiling (Figure I.19). Price movements in agricultural commodities have also benefitted from an increased demand from China. Conversely, net energy exporters have been suffering from low energy prices which have been reflecting the prolonged impact of the pandemic on global travel and oil demand.

Figure I.19. Some regional exports have benefitted from increasing industrial commodity prices and stable agricultural prices, but energy exporters still receive relatively low prices

A. Agriculture, energy, metal, and mineral prices



B. Commodity price changes since January 2020



Sources: Haver Analytics; World Bank.

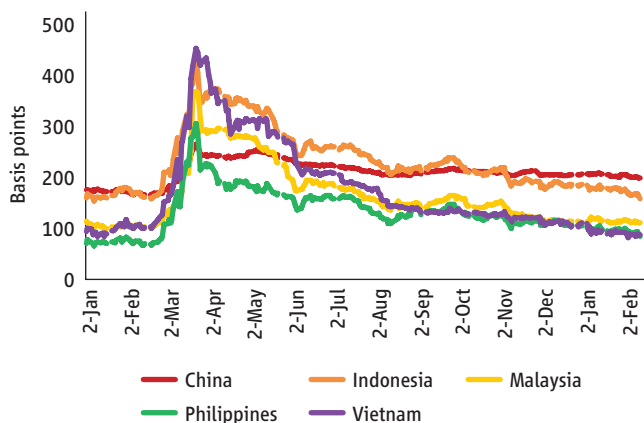
Note: A. B. Figure shows the change in the monthly average of commodity prices between January 2020 and the last observation, which is May 2020. Price changes for “Base metals” and “Food” show World Bank Pink Sheet indexes. Oil price is unweighted average of Brent, WTI, and Dubai prices.

• **Financial markets**

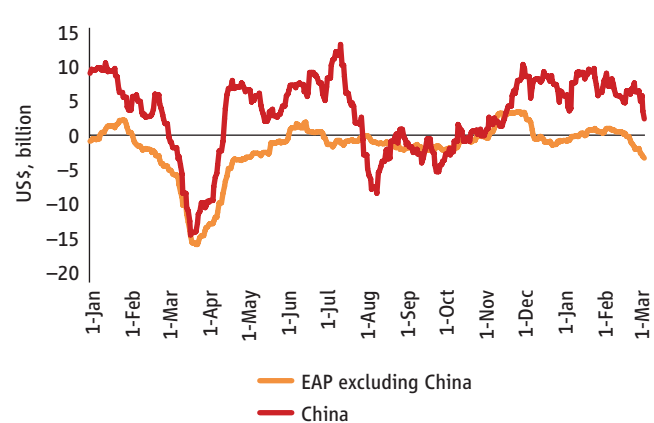
Global financial conditions have been generally supportive, as suggested by low borrowing costs and abundant credit issuance. More recently, positive news about vaccine developments and new stimulus measures in the United States supported a recovery in equity market valuations, which along with low interest rates have been fueling regional debt and equity fundraising. The continued commitment by central banks in major countries to asset purchases is also supporting the exceptionally benign financial conditions. The favorable international financial climate, thanks in large part to the extraordinary global fiscal and monetary expansion, has so far helped countries to avoid financial instability. This climate contributed to an increased appetite for emerging market and developing economy (EMDE) assets and higher equity inflows to EMDE equity markets, amid expectations of continued low interest rates in advanced economies (Figure I.20).

Figure I.20. Financial market sentiment has improved, and capital inflows have stabilized

A. EMBI spreads (basis points)



B. Equity and debt flows (US\$ billions, 28-day rolling sum)

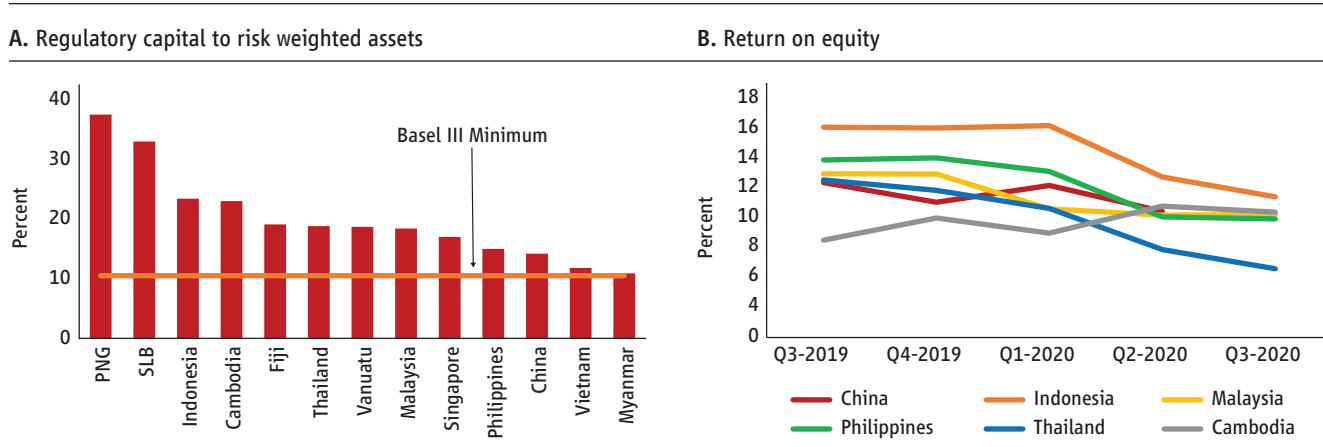


Source: Haver Analytics.

Most EAP financial systems appear to have sufficient capital adequacy. Regulatory capital to risk weighted assets (CAR) ratio is in excess of the 10.5 percent minimum required by Basel III, though the levels in Myanmar (11 percent)¹ and Vietnam (12 percent)² are slightly above the threshold, and China’s level (14 percent) is lower than in other large EAP economies (Figure I.21). However, the high capital buffers reported do not consider any potential increase in non-performing loans (NPL). The identification of and provisioning for NPLs has been delayed by the COVID-19 loan forbearance measures. In addition, virtually all EAP countries have experienced declines in their banking sectors’ return on assets (ROA) and return on equity (ROE) during the pandemic, with Indonesia, the Philippines, and Thailand seeing the biggest drops.

The banking sector risks being caught in a pincer: on the one hand it is being used as a conduit for COVID-19 assistance, which is leading to the emergence of an NPL burden behind the curtain of regulatory forbearance; on the other hand, the COVID-19-induced growth of digital payment services provided by nonbank entities, such as digital platform firms (example), is creating increased competition, which may be desirable in itself but is eroding margins in some of the most profitable banking activities.

Figure I.21. Financial systems in the region appear to have sufficient capital adequacy, but banking sector profitability indicators have declined

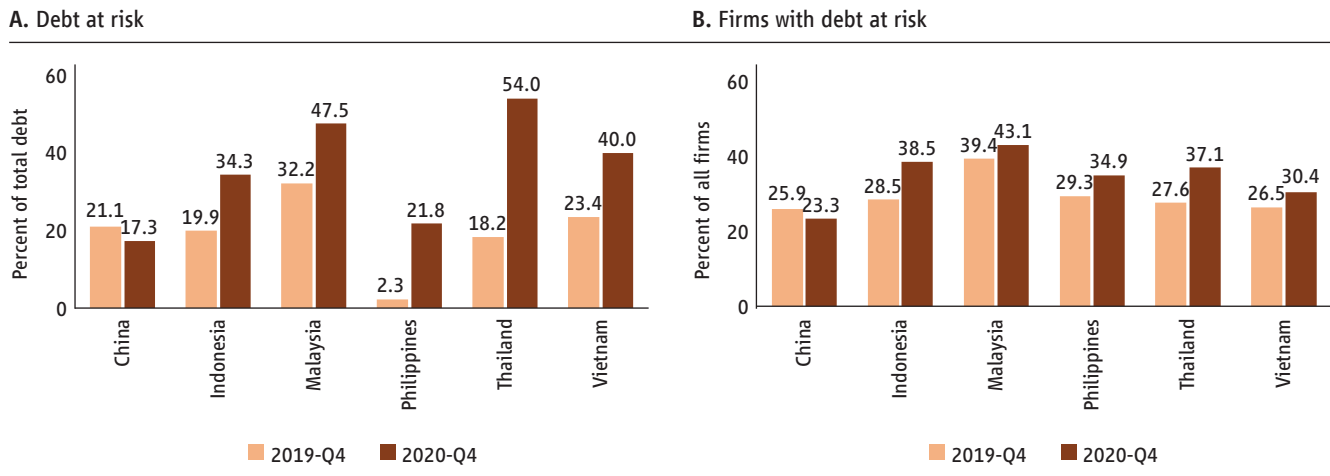


Source: International Monetary Fund Financial Soundness Indicators.
 Note: A. Q3 or latest available data.

The pandemic has had negative impacts on earnings of non-financial corporates. The Interest Coverage Ratio (ICR), a measure of a firm’s ability to cover short-term liabilities, has increased in all major economies in the region with the exception of China between last quarter of 2019 and last quarter of 2020 (Figure I.22).³ A firm’s debt holdings are considered “at risk” if the ICR is less than or equal to 1, namely, profit cannot cover interest expenses coming due. The deterioration is driven mostly by a decline in profit while interest expenses remains roughly level.

1 For Myanmar, the latest available capital adequacy ratio refers to Q4 2018.
 2 For Vietnam, the latest available capital adequacy ratio refers to Q2 2019.
 3 The ICR is defined as earnings before income and taxes (EBIT) divided by interest expenses.

Figure I.22. Solvency proxies have deteriorated in the region's economies since the start of the pandemic

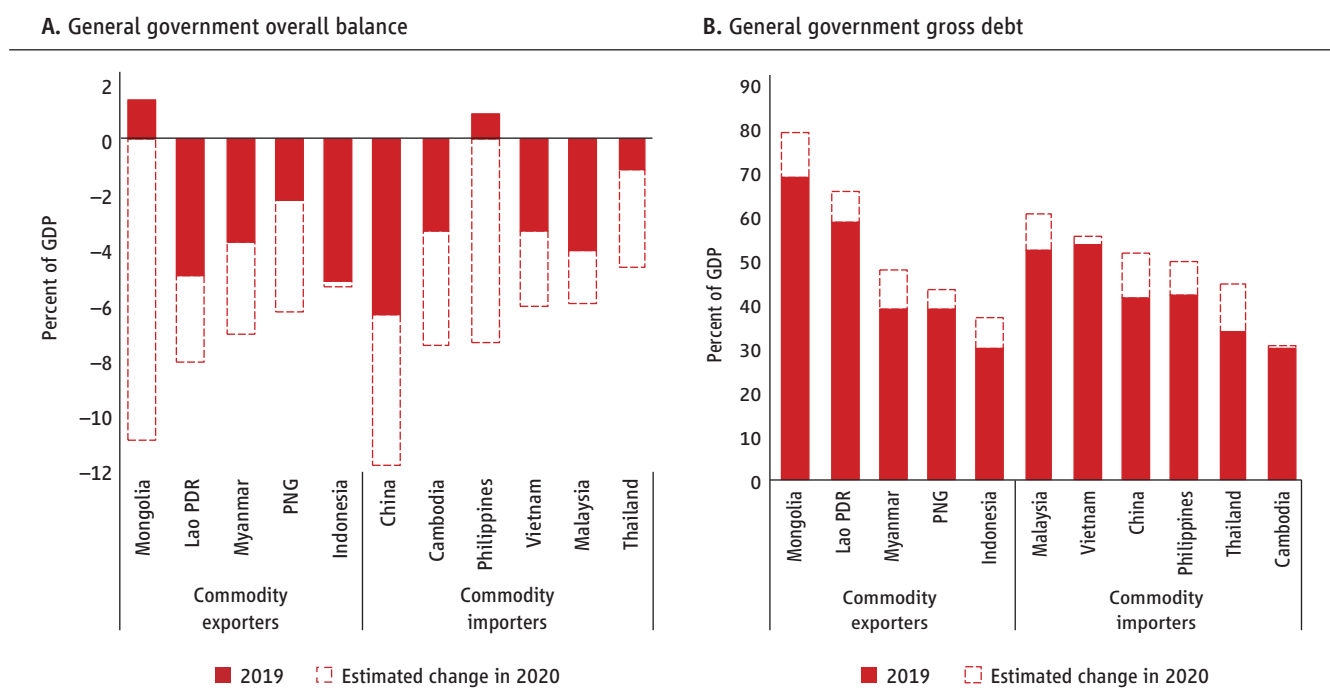


Source: World Bank staff calculation, Bloomberg.
 Note: Debt at risk evaluated based on Interest Rate Coverage ratio.

• **Government support**

Governments in the region have been relying heavily on fiscal policy to mitigate the impact of the crisis. The capacity to provide support differs significantly across countries in the region. As Table O.2 shows, at one extreme is China, which has provided a significant if somewhat unbalanced stimulus drawing upon its adequate fiscal space but runs the risk of exacerbating the problem of local and state-owned enterprise debt. At the other extreme, are the PICs which have limited fiscal space and have struggled to provide the support that their people and economies need. In many countries, sharp declines in government revenues and additional spending on large-scale fiscal support have resulted in a surge in fiscal deficits and record-high public debt levels in several EAP economies (Figure I.23). Higher government debt has been associated with lower growth outcome during 2020.

Figure I.23. Increased government support has resulted in widening fiscal balances and growing government debt

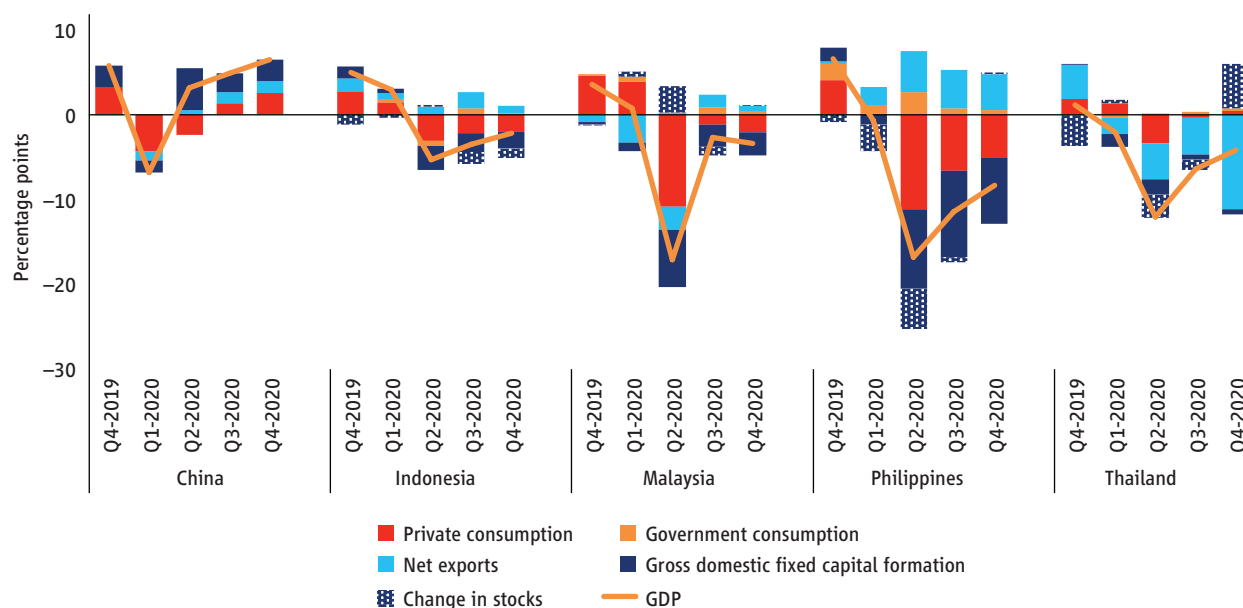


Sources: IMF Fiscal Monitor October 2020; World Bank.
 Note: Values refer to general government, except for Indonesia and Malaysia, which refer to central government only.

• Overall economic impact at the country level

Economic performance and the patterns of the recovery that followed COVID-19 shock, differed significantly across the region reflecting the net impact of the multiple factors described above. China and Vietnam managed to keep the virus contained and benefitted from a relatively fast resumption of production and exports. Public investment in both countries also contributed to economic growth. In China, the recovery, which was initially uneven and led by public investment and exports, has gradually broadened to consumption (Figure I.24). GDP expanded by 2.3 percent in China and 2.9 percent in Vietnam in 2020—still around 4–5 percentage points below potential and broadly in line with earlier projections (World Bank 2021; World Bank 2020c).

Figure I.24. All major economies of the region began to bounce back



Sources: Haver Analytics; World Bank.
 Note: For China, consumption includes private and government consumption.

In Indonesia, output contraction was relatively mild, largely reflecting only partial and localized mobility restrictions and relatively insignificant global spillovers. Activity in Malaysia, which collapsed in 2020-Q2 in response to strict social distancing measures, rebounded strongly with the removal of mobility restrictions and helped by government support measures. However, the recovery has stalled in 2020-Q4 on renewed social distancing measures which hit both consumption and investment.

In Thailand and the Philippines, GDP is still significantly below pre-pandemic levels. In Thailand, the collapse of tourism and travel translated into a sharp contraction of exports, which remained a major drag on GDP growth for much of 2020. The Philippines experienced the sharpest contraction of output among the largest economies of the region. The contraction reflected an uncontrolled COVID-19 outbreak combined with strict nationwide lockdowns and mobility restrictions, a succession of natural disasters, and delays in budget execution which weighed on public investment.

Among the smaller economies, Cambodia and Lao PDR, which have successfully managed the COVID-19 outbreak until recently, the collapse of the tourism industry contributed to the adverse performance in 2020. In Mongolia, the economy shrank primarily due to a sharp decline in demand for key commodities and a sharp drop in the services sector output, affected by the strict lockdowns. In Timor-Leste and Papua New Guinea, the impact from COVID-19 shock was compounded by political uncertainty.

All the Pacific Island Countries, except Nauru, fell into recession in 2020. The region's remoteness helped avoid a COVID-19 outbreak, but strict border closures and related trade disruptions had severe economic consequences, spilling over into construction, transportation, and domestic consumption. The largest negative impact was felt in tourism dependent economies, including Fiji, Palau and the South Pacific (Samoa, Tonga, Vanuatu). In Fiji and South Pacific Islands, the impact of the pandemic has been exacerbated by the impact of a range of natural disasters, including a devastating tropical cyclone and a measles outbreak.

Outlook

• Near term prospects

Successful containment of the disease in some countries will support a recovery of domestic economic activity, but lingering infections in other countries will be a drag on growth until wider implementation of the vaccine. Global economic recovery will revive trade in goods and provide an external boost to growth, but global tourism is expected to remain below pre-pandemic levels till 2023 and delay economic recovery in tourism-dependent economies. Even though the global financial climate remains benign, weakened corporate and bank balance sheets and persistent global uncertainty will dampen investment. Growing public debt and widening fiscal deficits will constrain further government spending in the near term. Recent US stimulus will likely boost global recovery and benefit the region (Box I.2)

Box I.2. Potential effects of the United States stimulus on the region's economies

The ongoing global recovery is expected to get a strong boost from the additional US stimulus, estimated at US\$1.9 trillion (9 percent of GDP), a large portion of which will be used for consumption and transfers. US growth—including that driven by the fiscal stimulus—is estimated to have sizable effects on activity in the rest of the world (OECD 2021).

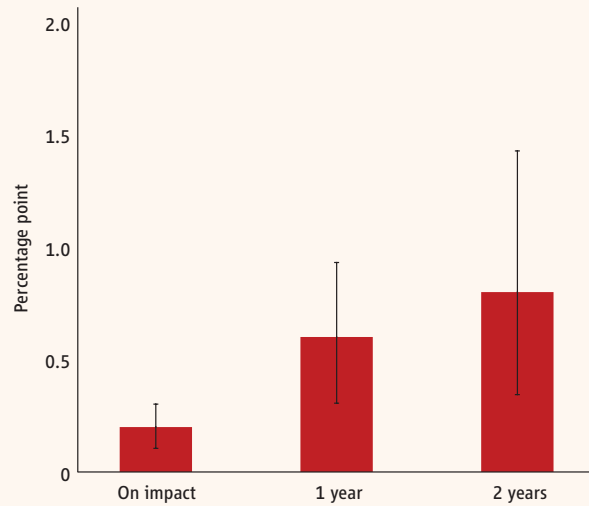
A stronger-than-expected global recovery due to the US stimulus could also boost growth in the EAP region. In general, a 1.0 percentage point increase in US growth is estimated to lead to a 0.6 percentage point increase on average in EMDE growth rates after one year (Figure I.B2.1). Trade, and the accompanying FDI increase will be the main real channel of transmission. The relatively export-oriented regional economies in the region—including Cambodia, Malaysia, Thailand, and Vietnam—are expected to benefit the most from higher growth in the United States and other advanced economies. The sizeable implications of US growth shocks on these countries reflect both the globally diversified nature of the region's exports, and the amplification of these shocks through their impact on other major economies. Spillovers on China's growth are expected to be modest, given the relatively low share of trade in GDP.

(continued)

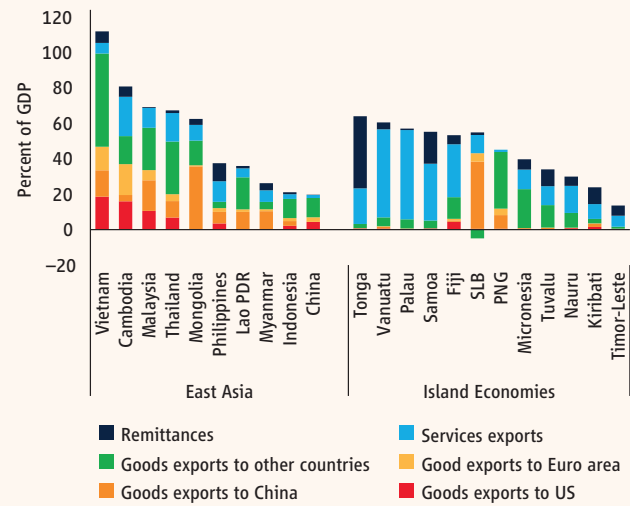
(Box I.2. continued)

Figure I.B2.1. An increase in US growth is likely to raise world growth

A. Impact of a 1 percentage point increase in the US GDP growth rate on EMDE growth rate



B. EAP countries trade and labor links to the rest of the world



Sources: Haver Analytics; World Bank; World Bank (2016).

Note: Cumulative impulse response of weighted average EMDE output growth to a 1 percentage point decline in growth in real GDP in the United States. Growth spillovers to EMDE based on a Bayesian vector autoregression of global GDP growth excluding the United States and EMDE, US GDP growth, the US 10-year sovereign bond yield plus JP Morgan's EMBI index, and EMDE GDP growth or investment growth. The oil price is exogenous. Bars represent medians, and error bars 16–84 percent confidence bands. Sample includes 20 EMDE for 1998-Q1–2016-Q2 period.

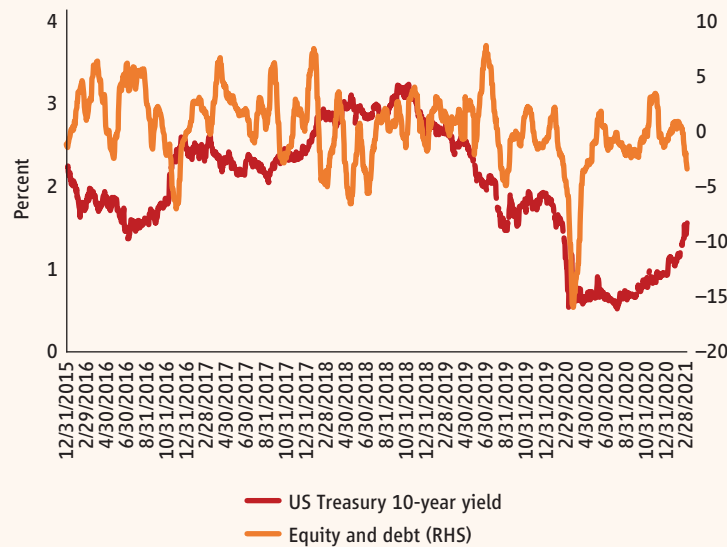
However, regional growth prospects will also be sensitive to shifts in global investor sentiment due to the tightening of global financing conditions. The announcement of the stimulus package has led to a sell-off in the US bond market and a steepening of the US Treasury yield curve. The spread between the yields on the US Treasury 10-year US Treasury bonds widened in February and March to the highest level in four years. This was accompanied by outflows of equity and debt from the EAP region (Figure I.B2.2). A further increase in yields could force some regional economies to prematurely tighten monetary policy to stem the capital outflow.

In general, we would expect the positive impact of increased global trade and FDI to be stronger than the negative impact of any global financial tightening. However, the net impact could be heterogeneous across countries—with those who are able to take advantage for the trade opportunities less vulnerable to any financial tightening than those who are not.

(continued)

(Box I.2. continued)

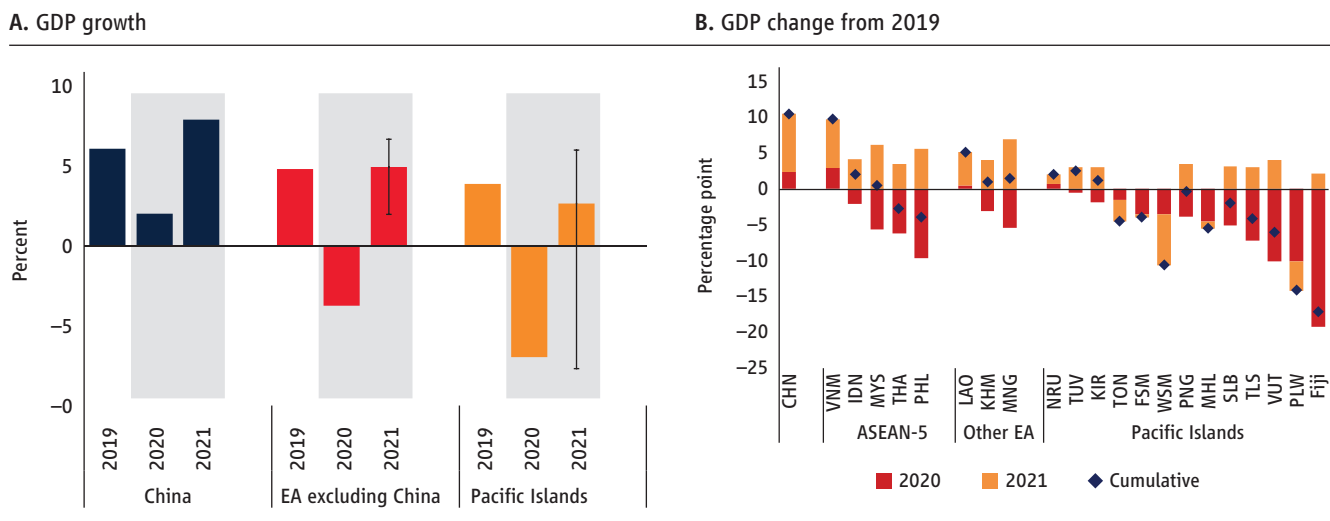
Figure I.B2.2. The 10-year US Treasury yield increased while equity and debt flows started to contract



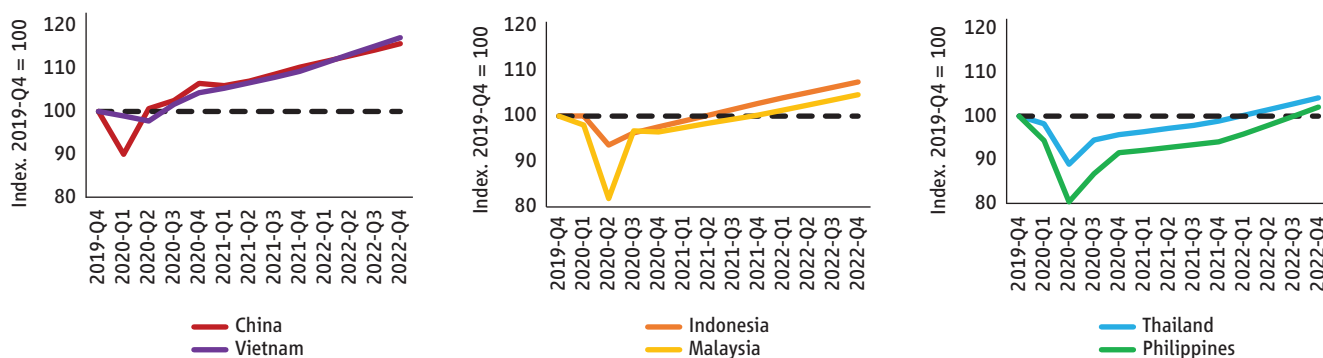
Sources: FRED; Institute of International Finance.
 Note: Red line: 10-Year Treasury Constant Maturity Rate, Percent, Daily, Not Seasonally Adjusted. Orange line: 28-day moving sum of equity and debt flows to EAP excluding China.

Against this backdrop, only China and Vietnam are expected to grow strongly in 2021, by 8.1 percent and 6.6 percent, respectively, while the rest of the region is expected to grow by only 4.4 percent. In Indonesia and Malaysia, output is expected to recover to its pre-pandemic level over the course of 2021. In Thailand and in the Philippines, output is projected to remain below pre-pandemic levels until 2022. Among smaller countries, the recovery is expected to be particularly protracted in tourism-dependent Island economies, even though they have been largely spared by the pandemic. Thanks to the rapid growth in economically dominant China, regional growth is expected to accelerate from an estimated 1.2 in 2020 to 7.4 percent in 2021 (Figures I.25–I.26).

Figure I.25. Regional growth is projected to accelerate in 2021



Source: World Bank.
 Note: Left panel: Year-on-year change of real GDP in 2010 prices. “EAP excluding China” includes Cambodia, Indonesia, Lao PDR, Malaysia, Mongolia, Myanmar, the Philippines, Thailand, and Vietnam. “Pacific Islands” includes Fiji, Kiribati, the Marshall Islands, Micronesia, Palau, Papua New Guinea, Samoa, the Solomon Islands, Timor-Leste, Tonga, Tuvalu, and Vanuatu. Aggregate growth rates are calculated using GDP weights in 2010 prices and market exchange rates. Blue lines denote forecast ranges under the baseline scenario. Data in shaded areas are forecasts. Right panel: Deviation from the levels under the baseline scenario implied by January 2020 GEP forecasts.

Figure I.26. Output will only slowly return to pre-COVID-19 levels in several of the region's economies

Source: World Bank staff estimates.

Note: Black (horizontal) dotted line shows 2019-Q4 index.

Growth in China is projected to accelerate to 8.1 percent this year, reflecting release of pent-up demand. Growth is then projected to stabilize at 5.4 percent—slightly below its earlier trend rate by late 2022, with fiscal consolidation, de-risking, and deleveraging preventing it from returning to its pre-pandemic trajectory (Table I.1). Domestic demand will continue to trend toward its pre-pandemic level, while its structure will gradually shift in favor of private domestic spending. However, long-term structural trends, including adverse demographics, tepid productivity growth, and the legacies of excessive borrowing are likely to reduce potential growth.

Vietnam's GDP growth is expected to rebound in 2021 to 6.6 percent, with exports continuing to perform strongly. Growth will converge with potential growth over the medium term as the manufacturing and services sectors recover. In the rest of the region, the recovery is expected to be more protracted. Following last year's contraction, output in the region excluding China is expected to expand by 4.4 percent in 2021 and 5.1 percent in 2022. Growth in the five largest emerging and developing economies in ASEAN—Indonesia, Malaysia, the Philippines, Thailand, and Vietnam—is expected to rebound in 2021, but prospects are conditional on their ability to inoculate enough people to control risks to public health and the economy.

In Indonesia, growth is expected to rebound to 4.4 percent in 2021. Jobs in low value-added services—such as trade, transport, and hospitality—were severely hurt by the crisis and will be the slowest to come back, especially if the outbreak remains unchecked. In Malaysia, going forward, a major decline in government revenues limits fiscal space for further support. Growth is expected to rebound to 6.0 percent in 2021, conditional on successful rollout of vaccines.

Thailand's economy is expected to recover gradually over the next two years, with growth rebounding to 3.4 percent in 2021 before converging to its trend of 4.7 percent in 2022. The recovery could be slow and start-stop in nature if the government is forced to reimpose stringent lockdowns. Prolonged political unrest could undermine consumer and business confidence. And the return of tourism, and domestic activity more generally, depends on a successful global vaccine rollout. In the Philippines, growth is expected to recover in the medium term, contingent on an improved external environment, a successful vaccination program, and the loosening of movement restrictions.

Among the smaller economies, in Cambodia, growth is expected to rebound to 4.0 percent in 2021, as agricultural exports and construction resume, before converging on a lower growth path than the country enjoyed prior to the pandemic. In Mongolia, in 2021, renewed investment in the mining sector should result in positive growth. In the short run, relief measures will be constrained by the government's rising deficit. Its fiscal consolidation plan commits to

Table I.1. Developing East Asia and Pacific: GDP growth projections

	2019	2020	2021	2022	2023
East Asia & Pacific	5.8	1.2	7.4	5.4	5.3
<i>East Asia & Pacific (excluding China)</i>	4.8	-3.7	4.4	5.1	5.1
ASEAN-5	4.7	-3.8	4.8	5.1	5.1
<i>Pacific Island Countries</i>	0.9	-11.3	1.0	6.2	5.3
China	6.0	2.3	8.1	5.4	5.3
Indonesia	5.0	-2.1	4.4	5.0	5.1
Thailand	2.4	-6.1	3.4	4.7	3.9
Malaysia	4.3	-5.6	6.0	4.2	4.4
Philippines	6.0	-9.5	5.5	6.3	6.2
Vietnam	7.0	2.9	6.6	6.5	6.5
Myanmar	6.8	1.7	-10.0		
Cambodia	7.1	-3.1	4.0	5.2	5.2
Papua New Guinea	5.9	-3.8	3.5	4.2	2.4
Mongolia	5.0	-5.4	6.8	7.2	7.1
Lao PDR	5.5	0.4	4.0	4.6	4.7
Fiji	-0.4	-19.0	2.6	8.2	6.9
Solomon Islands	1.2	-5.0	2.0	4.5	4.3
Timor-Leste	1.8	-7.3	2.9	3.8	4.2
Vanuatu	3.0	-10.0	4.0	3.9	3.3
Samoa	3.5	-3.5	-7.7	5.6	4.9
Tonga	0.7	-1.5	-3.0	2.3	2.8
Micronesia, Fed. Sts.	1.2	-1.5	-3.5	2.5	1.0
Kiribati	3.9	-1.9	3.0	2.6	
Palau	-4.2	-10.0	-4.0	12.0	6.0
Marshall Islands	6.6	-4.5	-1.0	3.0	2.0
Nauru	1.0	0.7	1.3	0.9	
Tuvalu	4.1	-0.5	3.0	4.0	

Source: World Bank staff estimates and projections.

Note: Percent growth of GDP at market prices. Values for 2021–23 represent forecast. Values for 2020 for the small island economies refer to GDP growth estimates. ASEAN-5 comprises Indonesia, Thailand, the Philippines, Malaysia, and Vietnam. Values for Timor-Leste represent non-oil GDP. For the following countries, values correspond to the fiscal year: Federal States of Micronesia, Palau, and Republic of the Marshall Islands (October 1–September 30); Nauru, Samoa, and Tonga (July 1–June 30). Myanmar growth rates refer to the fiscal year from October to September.

medium-term adjustment but keeps current support measures in place until mid-2021. In Lao PDR growth is expected to rebound to around 4.0 percent in the medium term, supported by strong exports, infrastructure investment, and a gradual recovery in services and private consumption. In Timor-Leste, going forward, fiscal policy remains the key driver of economic activity. Growth is expected to rebound to 2.9 percent in 2021, assuming the pandemic remains in check. In Papua New Guinea, growth is expected to rebound to 3.9 percent growth in 2020–2021, lower than the pre-pandemic forecast because of delays to resource extraction projects and “scarring” caused by pandemic-related disruptions.

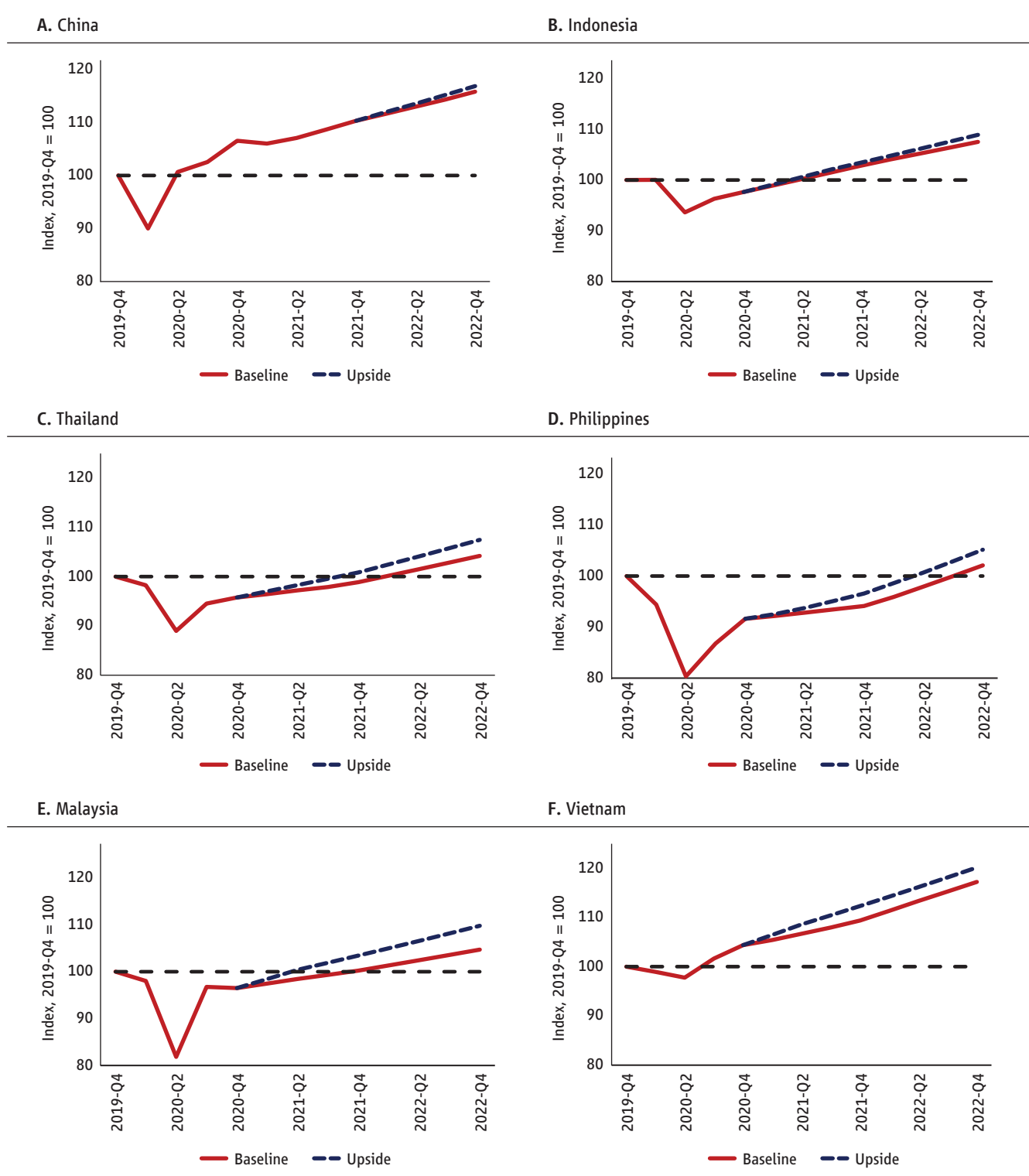
Among the Pacific Island countries, only Vanuatu and the Central Pacific countries are expected to return to positive growth in 2021, but they face diverse problems, including the sustainability and effectiveness of public spending, the exhaustion of phosphate mining in Nauru, and the extreme threat of climate change in Tuvalu. The near-term outlook remains dependent on the duration of COVID-19-related travel restrictions, and whether the region continues to remain free of the virus.

• Risks

Risks are more balanced than previously. Upside risks include successful vaccination and quick control of the pandemic, which together with significant policy reform and the diffusion of new technologies could boost productivity and growth and undo some of the COVID-19 damage. The significant US stimulus could also boost growth, through domestic and international multiplier effects, to a larger extent than anticipated in our baseline estimates and could bring the recovery forward by as much as one-quarter on average (Figure I.27).

However, on the downside, delays in vaccine distribution could lead to a persistence of the pandemic. Slow global suppression of the disease increases the risk of the emergence of new variants, that could be more infectious, lethal, and resistant to existing vaccines. Continued economic pain may worsen balance sheets further and could lead to a financial crisis in some countries. The favorable financial climate, thanks in large part to the extraordinary global fiscal and monetary expansion, has so far helped countries avoid financial instability but the disconnect between financial and real markets may not persist. There is a risk that the positive impact of the US stimulus could be eroded by the negative impact of the resultant global financial tightening—with countries which are unable to take advantage of the trade opportunities more vulnerable.

Figure I.27. Faster global growth could bring recovery forward by as much as one-quarter in some of the region’s economies



Source: Haver Analytics; World Bank.

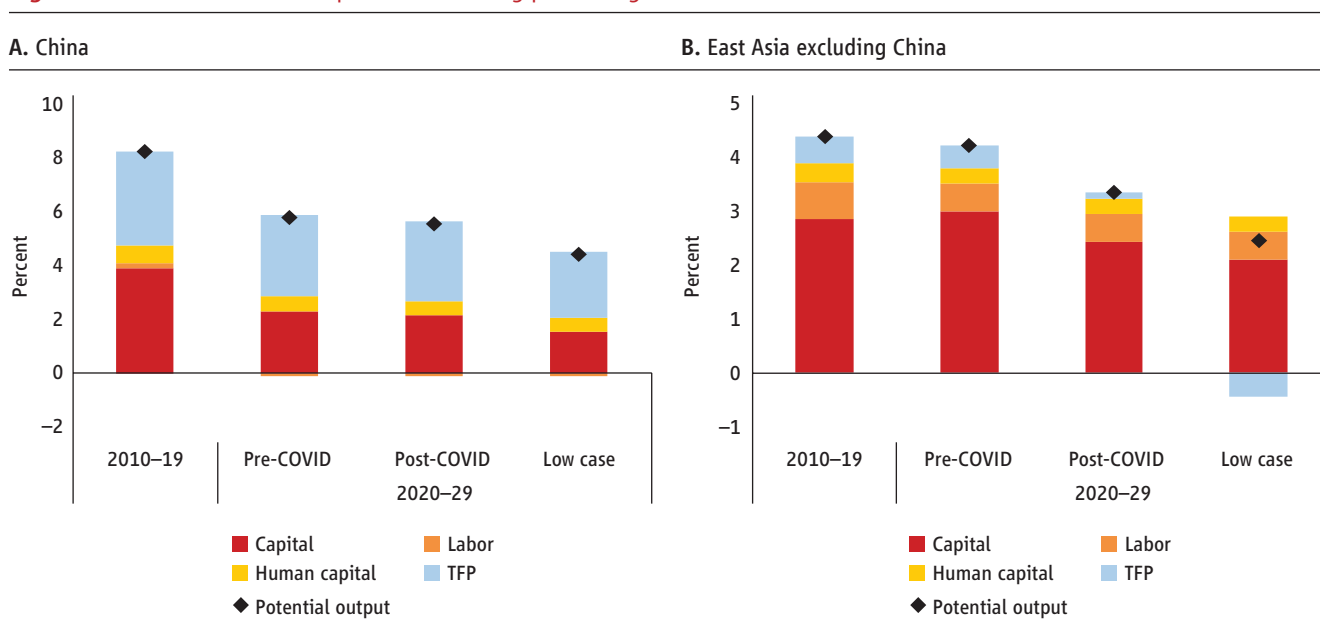
Note: Hypothetical scenarios based on a Bayesian vector autoregression of global GDP growth excluding the United States and AE or EMDE, US GDP growth, the US 10-year sovereign bond yield plus JP Morgan’s EMBI index and AE or EMDE GDP growth or investment growth.

• Implications for long-term growth

As documented in the Fall 2020 EAP Economic Update, potential growth—the growth rate at which an economy would fully utilize capacity and fully employ its labor force—was decelerating in the region even before the COVID-19 crisis. Aging in China, Thailand, and Vietnam is dampening labor supply. Tighter credit and heightened policy uncertainty are lowering investment rates and slowing the pace of capital accumulation. Slowing human capital accumulation and slowing factor reallocation across sectors are contributing to lower total factor productivity growth.

Before the COVID-19 shock, EAP potential growth was expected to decline in the next decade by 2 percentage points, from 7.5 percent in the last decade (2010–19) to 5.5 percent on average (over 2020–2029). Most of the decline in potential growth reflected deceleration in China (Figure I.28).

Figure I.28. COVID-19 will dampen a decelerating potential growth even further



Sources: Penn World Tables; World Bank staff estimations.
 Note: GDP-weighted averages of production function-based potential growth. TFP is total factor productivity growth.

The uneven nature of the COVID-19 shock on the regional economies is affecting growth dynamics in the region. The impact is expected to be stronger in countries other than China, reflecting a more severe and durable impact of the pandemic on the drivers of potential growth investment, productivity, and labor force participation, and even taking into account the positive impact of the diffusion of new technologies. Under a baseline scenario, which reflects the negative impact of COVID-19, future growth over the period 2020–29 in China could be 0.2 percent lower, and for the region excluding China could be as much as 0.9 percentage point lower than pre-COVID-19 projections.

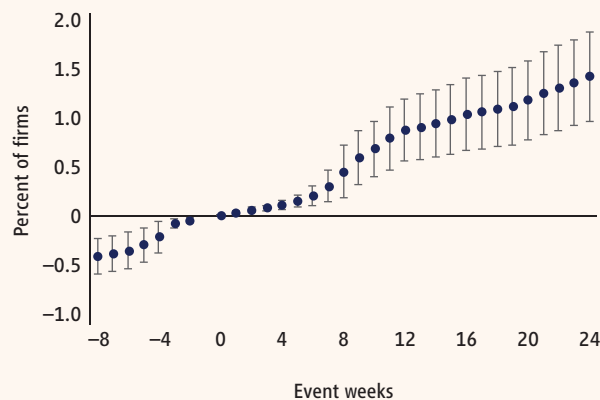
Under a more pessimistic scenario, which assumes slower recovery in investment and hence a more negative impact on productivity and capital stock, potential growth is expected to decline by 1.4 percentage points in China and 1.8 percent in EAP excluding China compared to pre-COVID-19 projections.

Timely and effective policy efforts can soften the adverse effect of COVID-19 on potential growth (World Bank 2018a). Efforts to promote higher investment, improve education and health outcomes, and close the gap between male and female labor force participation would help. Investment growth would not only boost potential growth by adding to the capital stock, but also via improved total factor productivity (TFP). Improvements in education (in terms of secondary and tertiary enrollment and competition rates) and health outcomes (in terms of life expectancy) can improve potential growth via their effect on labor supply and TFP growth. Raising the labor supply can also be achieved through reforms aimed at increasing female labor force participation rates. A silver lining is that adoption of digital technologies seems to be on the rise, which could boost productivity growth (Box I.3).

Box I.3. Digital adoption during COVID-19

Firms were faced with numerous hurdles, especially to in-person sales, including disruption to distribution networks, temporary closures of wholesalers and retailers (either through legislative action or on their own willingness), and a customer base less inclined to visit stores and even leave their homes (Huang, Sawaya, and Zipser 2020). This resulted in a considerable demand shock, away from in-person and toward online demand, which induced firms in emerging countries to accelerate adoption of e-commerce technology to reach customers online (Figure I.B3.1).

Figure I.B3.1. Firms in emerging markets accelerated e-commerce adoption following the first COVID-19 cases in their countries



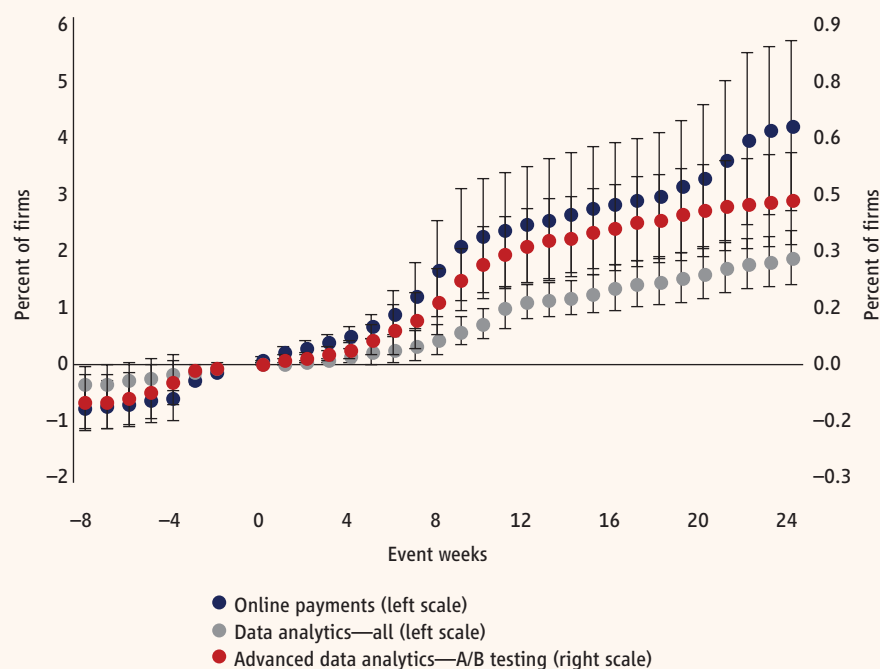
Source: DeStefano and Timmis (forthcoming) using Builtwith data as of January 2021 matched to 2019 Aberdeen Ci Technology Database (CiTDB).

Note: Event study plot where the x-axis shows event time in weeks—relative to the first COVID-19 cases. First COVID-19 cases is defined as at the first time at least 1 new daily case was recorded per 10 million people (daily cases measured using a seven-day moving average). COVID-19 cases taken from Oxford Covid-19 Government Response Tracker. Unweighted average of country-level adoption for firms in Brazil, China, the Czech Republic, Hungary, India, Mexico, Poland, the Slovak Republic, and Thailand. Includes country fixed effects and standard errors are clustered at country levels. Shaded areas reflect 95% confidence intervals. Coefficients are normalized relative to the omitted category at week $t-1$, the week before the first COVID-19 cases.

Firms are not only adopting e-commerce in response to COVID-19, but rather we see broader diffusion of several technologies. A sizeable proportion of firms increased the use of online payment systems and general data analytics tools (including website visitor tracking and feedback forms) (Figure I.B3.2). The largest absolute increase in technology use was for online payment technologies, likely driven by the need to reach customers through online transactions as opposed to in-person sales.

(continued)

(Box I.3. continued)

Figure I.B3.2. COVID-19 has accelerated adoption of a broad range of technologies

Source: DeStefano and Timmis (forthcoming) using Builtwith data as of January 2021 matched to 2019 Aberdeen Ci Technology Database (CTDB).

Note: Event study plot where the x-axis shows event time in weeks—relative to the first COVID-19 cases. COVID-19 cases taken from Oxford Covid-19 Government Response Tracker. Unweighted averages includes country fixed effects, and standard errors are clustered at country levels. Bars reflect 95% confidence intervals. Coefficients are normalized relative to the omitted category at week $t-1$, the week before the first COVID-19 cases. Data analytics includes both advanced functions, such as A/B testing, and more basic functions, such as visitor count tracking, feedback forms, and error tracking. A/B testing reflects an advanced data analytic technology, where firms randomly show visitors different versions of their website and track visitor behavior (such as purchases) in response, in order to optimize their website design.

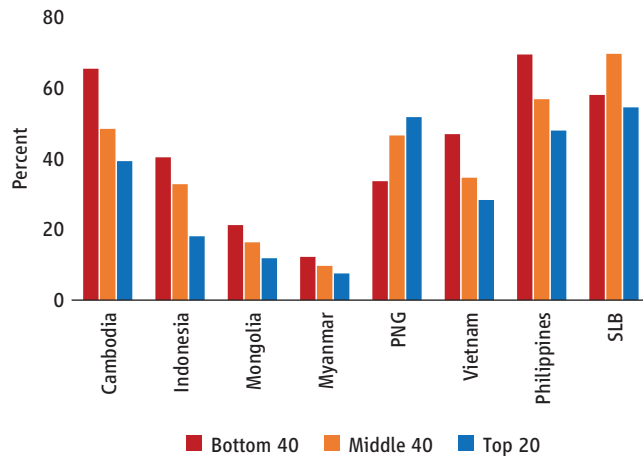
Adoption of advanced data analytics technology is predominantly by firms that were already large, productive, and had sophisticated technologies pre-COVID-19. Adoption of e-commerce, a more accessible technology, is predominantly by domestically owned and, if anything, smaller firms. E-commerce has been more rapidly adopted by domestic-owned firms, and firms with only a single establishment. Productivity gains are likely to be small but positive, and driven by a minority of firms which have been adopting more sophisticated technologies such as data analytics.

• Implications for inequality

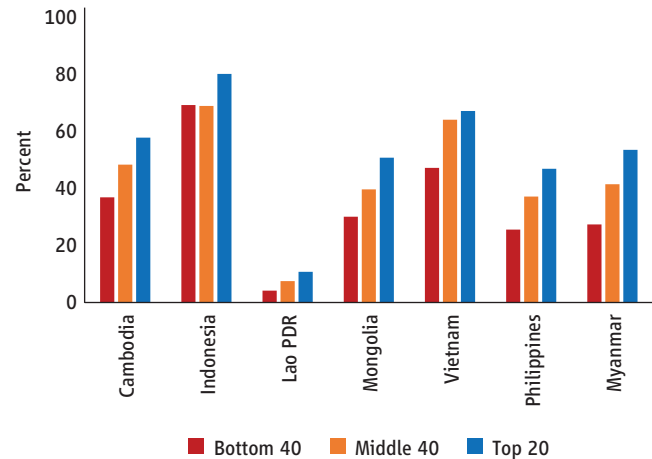
The pandemic is likely to increase inequality in both the short and longer terms. In the Philippines, where containing the virus remains a challenge, households in the richest quintile are less likely to report earnings declines and those who do, report lower losses than their poorer counterparts. The welfare effects of income and employment losses in terms of depletion of physical and human capital are also more dire among the poor. For example, when faced with income losses, poorer households are more likely to reduce their food consumption, accumulate debt, and sell assets, all of which may undermine their ability to recover from the crisis. At the extreme, food insecurity tends to be higher among households in the bottom 40 (Figure I.29). Women are suffering more than men: 25 percent of respondents in Lao PDR and 83 percent in Indonesia said that intimate partner violence worsened due to COVID-19 (Box I.4). Food insecurity makes women more vulnerable to violence, economic empowerment less so. School closures and related learning losses also appear to be greatest among the poor (World Bank 2020c). Indeed, as countries have shifted to distance learning modalities, students from wealthier households have been significantly more likely than those from poor households to remain engaged in online, mobile, or face-to-face educational activities (Figure I.30). Finally, as discussed later in this report, vaccinating the poor and underserved may be difficult, especially if vaccines are administered at a cost.

Figure I.29. Food insecurity is more prevalent among poorer households

Share of households that eat less than they should due to lack of money

**Figure I.30.** Richer students are more likely to remain engaged in learning activities

Share of households with enrolled students that were engaged in online, mobile, or face-to-face learning activities



Source: World Bank High-Frequency Household Phone survey.

Note: Figure I.29 uses data from the initial round, fielded between May and August. Figure I.30 uses latest available rounds, except for Cambodia where the round coincided with the school term break and second round of school closure.

Box I.4. COVID-19 has led to an increase in gender-based violence in East Asia and the Pacific

Gender differences in work stoppages persisted or widened in countries like Indonesia and the Philippines in the latter half of 2020, as more women stayed at home amid containment measures that restricted mobility and as childcare responsibilities increased due to school closures. Furthermore, female-headed households continued to be more likely than male-headed ones to be food insecure in Indonesia, Cambodia, and Mongolia. Female-headed households across countries were also more likely to rely on reducing food consumption as a way of coping with the economic impacts of the pandemic throughout the year.

Collecting data on Gender-Based Violence (GBV) is notoriously difficult, especially during a pandemic when victims are likely to have less access to services. Phone surveys could help, but the phone surveys impose limitations in establishing rapport between the interviewer and interviewee, frequently critical for disclosure. More importantly, survivors of GBV may be in the same space as their abusers. In these settings, special precautions are needed in order to ensure safety of the respondents.

To overcome these difficulties, East Asia and Pacific Gender Innovation Lab staff developed a series of proxy measures, which capture the likelihood of exposure to GBV without directly asking about it. These measures include questions about injuries and stress, as well as vignettes about violence in the community. Results suggest that violence in the community, including gender-based violence has increased in Indonesia and Lao PDR.⁴ Notably, 25 percent of respondents in Lao PDR and 83 percent of respondents in Indonesia said that intimate partner violence in the community has worsened due to COVID-19 (Figure I.B4.1). An exploration of factors

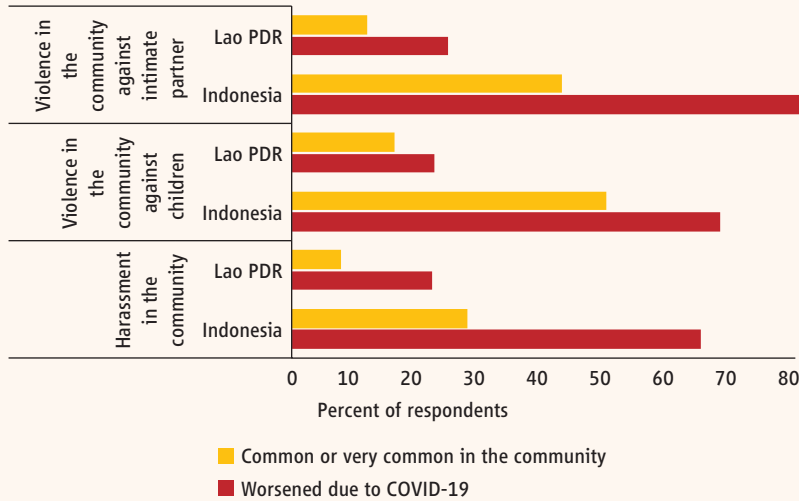
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⁴ The data are not nationally representative. In Indonesia it includes 6 provinces with higher rates of migration. In Lao PDR it covers poor rural areas.

(Box I.4. continued)

that likely triggered an increase in violence for individual women suggest that food insecurity is the strongest predictor of an increase in GBV. Economic empowerment appears to protect women: access to the second job was the strongest protector of women from GBV in the same dataset.⁵

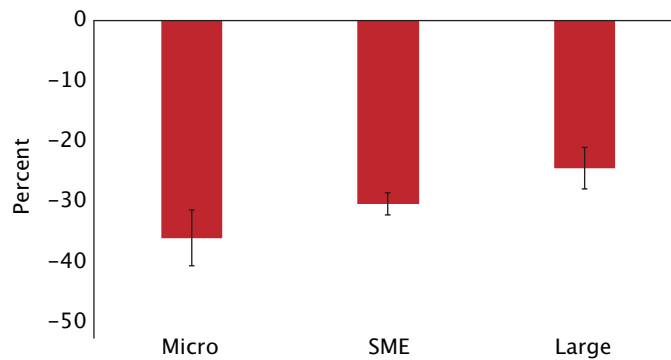
Figure I.B4.1. Risks of violence in communities due to COVID-19 in Indonesia and Lao PDR



Source: EAPGIL high-frequency surveys.

COVID-19 and related shutdowns have also had an *uneven impact on sales across firms* within each economy. Smaller firms, SMEs, and especially microenterprises suffered a proportionally larger drop in sales than large firms (Figure I.31). These differences persist after controlling for initial labor productivity, firms’ age and location (whether in the capital region or elsewhere in the country), and firms’ linkages to international markets (either via imports or exports).

Figure I.31. Microenterprises and SMEs suffered a proportionally larger loss in sales compared to larger firms



Source: Business Pulse Surveys.

Note: Bars show percent of firms reporting loss in sales. Controlling also for initial productivity, whether the establishment has received any public support, whether it has increased use of digital platforms, stringency of containment measures, round and country fixed effects. SME refers to small and medium enterprises. Micro, SME, and Large are defined as firms with less than 5, 5–100, and 100+ employees, respectively.

5 Halim et al. (2020).

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Part II. Policy

Part II.A. Deploying the COVID-19 vaccine in EAP⁶

Overview

For a world desperately seeking solutions, COVID-19 vaccines appear as a godsend, to be deployed everywhere and as soon as possible. As the efficacy of new vaccines in preventing illness was demonstrated, attention has shifted to the challenge of rapid, mass vaccination. But it is becoming clear that vaccines alone are not a panacea that will end the pandemic anytime soon. The virus is likely to continue to extract a significant toll in illness and human life, as well as economic and social disruption, through 2023. To alleviate the pain, countries will need to develop more sophisticated strategies.

The first reason for diminished expectations is inadequate aggregate supply and unequal access to vaccines, and a limited supply of consumables for other critical non-pharmaceutical interventions (NPIs). Under current plans, universal vaccination will not be achievable for most people before 2022 at the earliest. The key constraints are: global production capacity, which even under optimistic forecasts is barely enough to cover the world's population; the fiscal capacity in developing countries to purchase vaccines; and the variation in efficacy of vaccines. Consequently, a two-tier world is emerging. Mostly high-income countries are seeking universal vaccination by early-2022, using the most effective vaccines they can secure. Most developing countries are pursuing more limited and slower vaccination targets based on the 20 percent coverage supported by COVAX,⁷ relying primarily on cheaper, less effective vaccines. We estimate that at the end of 2021, in a very optimistic scenario, effective coverage in high-income countries will be 81 percent, and in developing countries at best 55 percent.

The second reason is the emergence of new SARS-CoV-2 virus variants of concern (VOCs) in different parts of the world. These mutations have two different impacts on the pandemic. Increased transmissibility—the UK B117 variant is 40–70 percent more transmissible than the wild variants—makes it harder to control viral spread with vaccination and non-pharmaceutical interventions (NPIs) and raises the vaccination coverage that is required to achieve herd immunity. Immune evasion—as conferred by the E484K mutation found in the South African and Brazilian VOCs—directly impairs vaccine efficacy, which also increases the vaccination coverage required to achieve herd immunity. Although vaccines can be redesigned, the process is costly and might not be fast enough to keep ahead of the evolving virus.

What are the policy implications of the divergence in access and the emergence of new variants?

- First, in countries where COVID-19 control has not been achieved, like Indonesia and the Philippines, rapid vaccination is a priority to reduce high numbers of deaths and pressure on struggling health systems. The challenge for these countries is to procure and distribute sufficient vaccines and to address any vaccine hesitancy among people through effective information campaigns. Countries, such as China and Vietnam, that are effectively pursuing

⁶ Based on “Deploying the COVID-19 Vaccine: Where, When and How?” by Aaditya Mattoo and Ravindra Rannan-Eliya, forthcoming.

⁷ COVID-19 Vaccines Global Access, abbreviated as COVAX, is a global initiative whose aim is to accelerate the development and manufacture of COVID-19 vaccines, and to guarantee fair and equitable access for every country in the world. COVAX is led by UNICEF, Gavi, the Vaccine Alliance, the World Health Organization (WHO), the Coalition for Epidemic Preparedness Innovations (CEPI), and others.

COVID-19 elimination, have space to develop a more suitable vaccination strategy for their large populations. For example, even as they move quickly to vaccinate the more vulnerable, they may choose to implement mass vaccination gradually as they obtain better evidence on the efficacy of vaccines against the VOCs.

- Second, since vaccination will not be sufficient to completely suppress viral transmission soon in most countries, governments must enhance other non-pharmaceutical interventions (NPIs), especially testing-tracing-isolation, that would magnify the impact and cost-effectiveness of vaccines.
- Third, the threat posed by new VOCs creates a global health and economic interest in suppressing viral transmission everywhere. Striving for suppression is also likely to make it easier to manage longer-term outcomes in which the new coronavirus becomes an endemic like influenza.
 - Export restrictions on COVID-19 related medical products could create a mismatch between access and need, making it harder to contain the disease. Therefore, it is important to keep trade open along the value chain for vaccines and other products.
 - The threat of VOCs also strengthens incentives for countries like China which have suppressed infection at home to prioritize vaccine allocation to high transmission countries where VOCs are most likely to emerge. While China has already exported vaccines to 22 countries, it could scale up and export more vaccines if efforts to obtain international approval were accelerated, and if a better balance were struck between public safety and production efficiency, easing the manufacture of multi-val vaccine, at least for exports.
 - For deeper international cooperation to be rational for individual countries, global suppression must be credible—which requires adequate global supplies of vaccines and NPI consumables. Therefore, China, Europe, India, Russia, the US, and other countries need to collaborate more closely in efficient approval and production of effective vaccines and consumables for NPIs.

Projected Vaccine Availability and Impact through 2021

Available production forecasts suggest that total vaccine production through 2021 may be sufficient to vaccinate 6–8 billion people, or all adults and most children, in the world (Table II.A.1). But this is a highly optimistic scenario, in which all advanced vaccine candidates are approved by regulators and producers meet their production targets—in a context where manufacturers have consistently and substantially undershot their delivery forecasts to date, reflecting systematic optimism bias about production. Leaving that aside, there are still two problems.

Table II.A.1. Details of vaccines expected to be delivered by end-2021

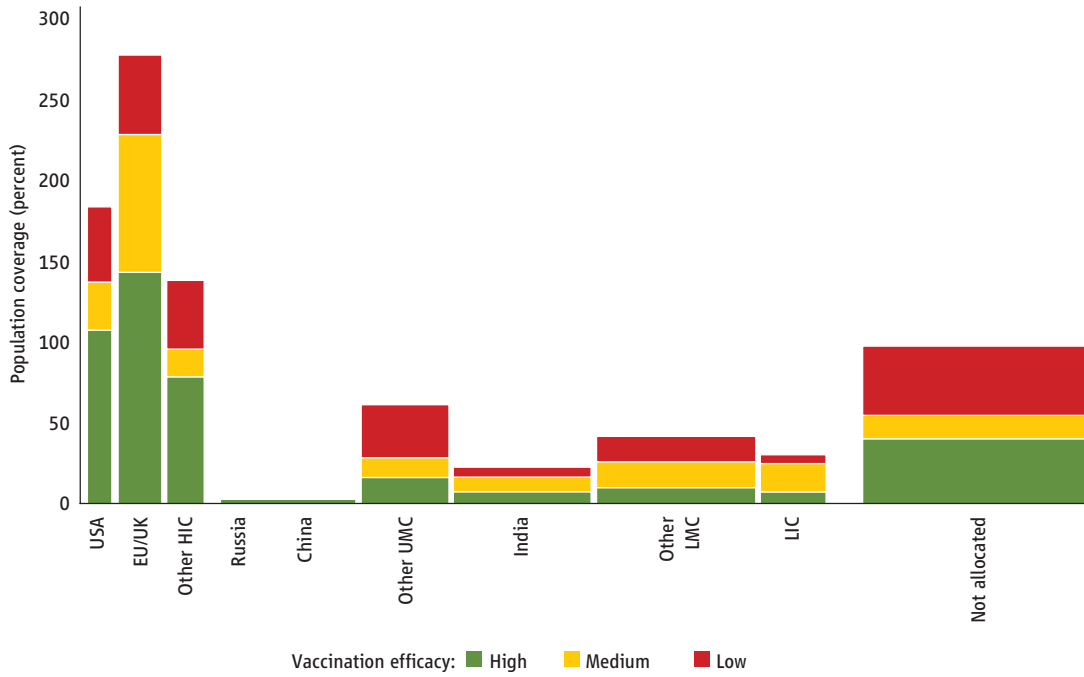
<i>Vaccine</i>	<i>Type</i>	<i>Country</i>	<i>Efficacy (%)</i>	<i>Price per person covered (US\$)</i>	<i>Available doses (million)</i>	<i>Doses to vaccinate 1 person</i>	<i>Population coverage (millions)</i>
AstraZeneca/Oxford	AdV vector	Sweden/UK/India	70	5	2,585	2	1,293
Pfizer/BioNTech	mRNA	USA/Germany	95	14	2,000	2	1,000
Moderna	mRNA	USA	94	31	1,000	2	500
Novavax	Protein subunit	USA	96	6	2,030	2	1,015
Gamaleya	AdV vector	Russia	92	6	728	2	364
Johnson & Johnson	AdV vector	USA	72	9	1,100	1	1,100
Sanofi/GSK	Protein-based	France/UK	70	19	0	2	0
Sinovac	Inactivated	China	50	21	1,000	2	500
Sinopharm	Inactivated	China	79	62	1,000	2	500
CanSino	Viral vector	China	66		320	1	320
CureVac	mRNA	Germany	95	24	300	2	150
Arcturus	mRNA	Singapore	95		0	2	0
Medicago	Protein subunit	Canada	96		80	2	40
Covaxx/Nebraska University	Peptide	USA	70		2	2	1
Valneva	Inactivated	France/UK	70		0	2	0
Bharat Biotech	Inactivated	India	70	6	700	2	350

Source: Data obtained from information published by official agencies, manufacturers, and news media as of February 19, 2021.

First, 25–30 percent of forecast production consists of excess purchases by some, mostly high-income, economies and production that has not yet been purchased. The result is large shortfalls in nominal commitments to developing countries, which have less ability to self-purchase vaccines and are substantially dependent on COVAX and donations (Figure II.A.1). The coverage in EAP on average is less than 30 percent of the population.

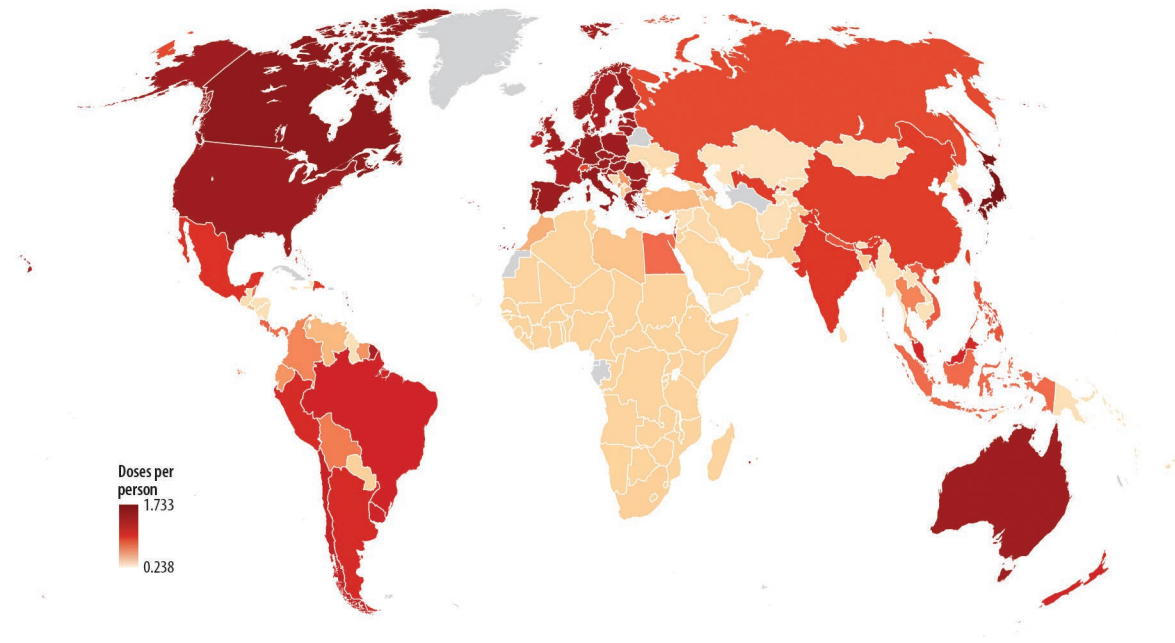
Figure II.A.1. Large shortfalls in nominal vaccine commitments to developing countries

A. Nominal vaccine commitments by country groupings by end-2021 (percent of population)



B. Nominal vaccine commitments by country by end-2021 (percent of population)

Total vaccine doses confirmed per person



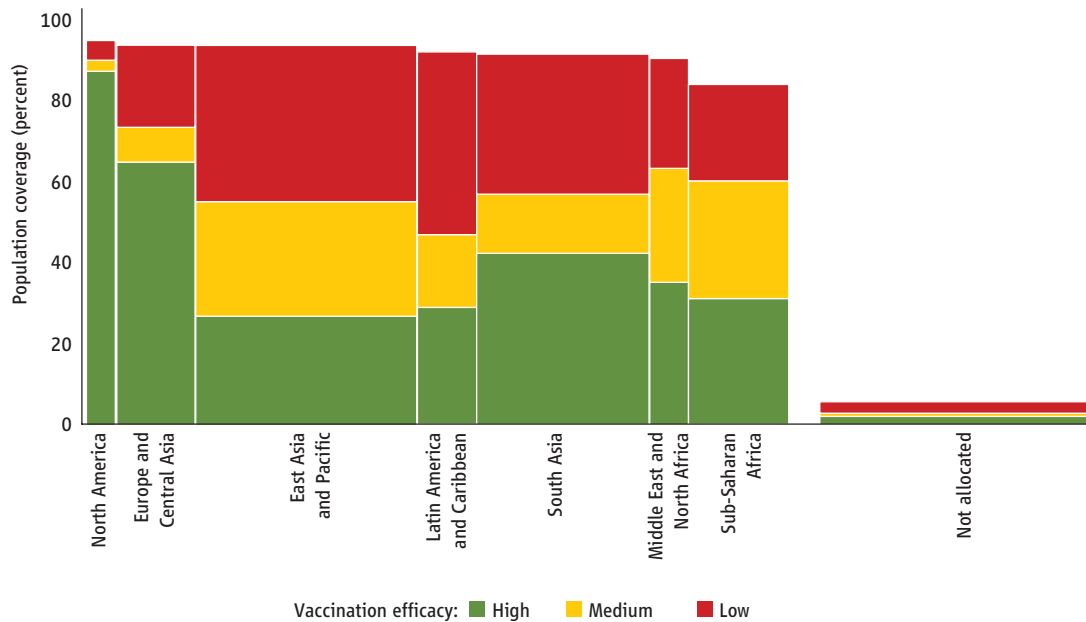
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Source: Data obtained from information published by official agencies, manufacturers, and news media as of February 19, 2021. Note: Available vaccine volumes based on reported production to end-2021, with estimation of 2021 production in cases where information sources do not provide breakdowns by year. Allocations based on information on country purchases, allocations, and plans obtained from news media, Duke Global Health Innovation Center, and COVAX.

UNEVEN RECOVERY

This vaccine inequity problem that concerns many observers could be resolved eventually through high income countries releasing their excess orders, and additional funding for COVAX and other cooperative initiatives to purchase and allocate available vaccines to other countries. Under such an optimistic scenario and assuming that all producers meet their production targets and that regulators approve all vaccines for use in children, there would then be sufficient vaccines to cover all adults and children ages five years and above in the world, including the EAP region, by end-2021 (Figure II.A.2).

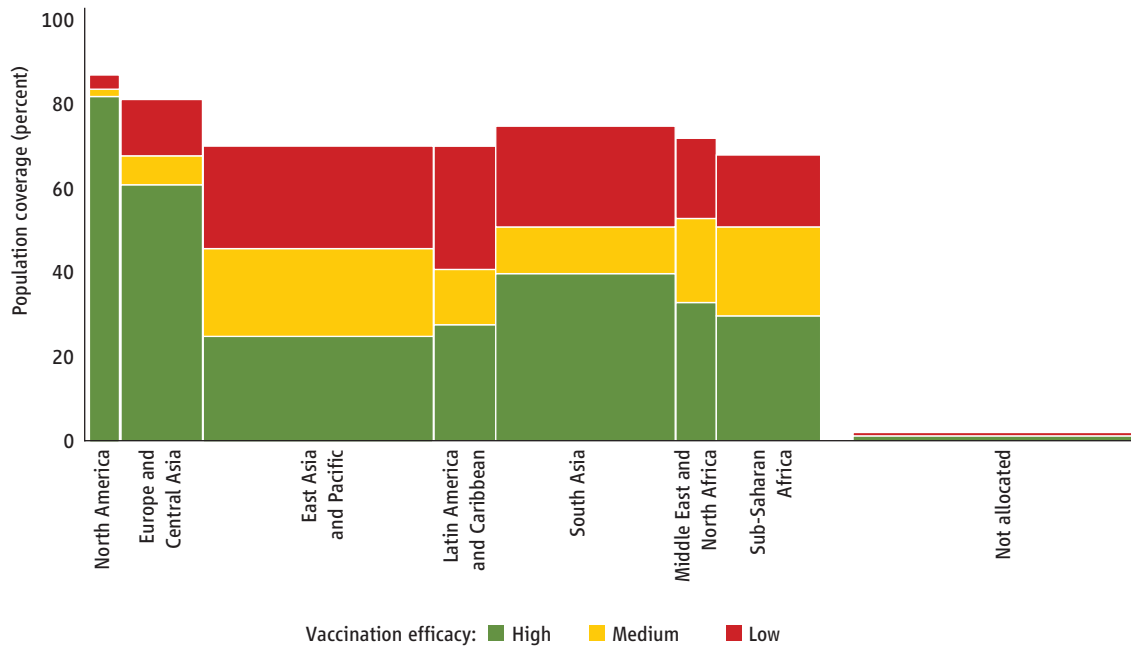
Figure II.A.2. Nominal vaccine coverage by region by end-2021 after reallocating surplus vaccines to all children ages 5 to 17 years (percent of population)



Source: Data obtained from information published by official agencies, manufacturers, and news media as of February 19, 2021.
 Note: Same as Figure II.A.1, except by region.

Second, the calculation above does not account for variations in efficacy between different vaccines (Table II.A.1). Most of the more effective vaccines, such as Pfizer and Moderna, have been purchased by high income countries, with developing countries and COVAX largely dependent on the less effective vaccines, such as AstraZeneca and Sinovac. Consequently, even under the most optimistic scenarios of production and support for access by developing countries, the distribution of effective vaccine coverage, defined as the population covered adjusted by efficacy, will be highly skewed between countries in different income groups, as shown in Figure II.A.3, with effective population coverage less than 70 percent in much of the world, including the EAP region.

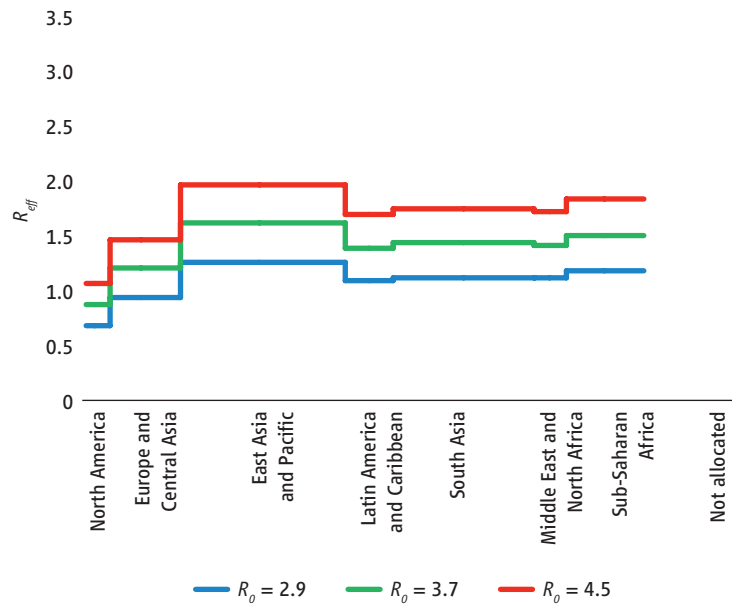
Figure II.A.3. Effective vaccine coverage by region by end-2021 after reallocating surplus vaccines to all children ages 5 to 17 years and adjusting for efficacy (percent of population)



Source: Data obtained from information published by official agencies, manufacturers, and news media as of February 19, 2021.
 Note: Same as Figure II.A.1, except by region.

This difference in effective coverage has significant implications for the level of immune protection and the reduction in viral transmissibility, represented by the effective reproduction number, that vaccines will deliver in each country. For herd immunity to be achieved, the effective reproduction number (R_{eff}), which quantifies the average number of secondary infections generated by one infected person at a given time, must be reduced below one. Under even the highly optimistic assumptions that the basic transmissibility of the virus (R_0) remains at the level it was during 2020 and that all people ages five years or above are vaccinated as sketched out in the preceding scenario, and taking into account acquired immunity from natural infection, most countries will not be able to achieve herd immunity. This is shown in Figure II.A.4, which models the impact of vaccination on transmissibility in different country groupings. As this analysis makes clear, under these very optimistic assumptions, vaccines alone will only be sufficient to reduce R_{eff} to around 1.2–1.8 in most developing countries, including the EAP region, while they may be just enough to achieve herd immunity in developed countries. Consequently, vaccine inequity between rich and poor countries is not only one of disparities in volumes of vaccines, but also in the ultimate protection afforded by them.

Figure II.A.4. Impact of projected vaccine coverage on COVID-19 transmissibility (R_{eff}) by region by end-2021 in absence of other control measures or behavioral changes



Source: Analysis by IHP staff.

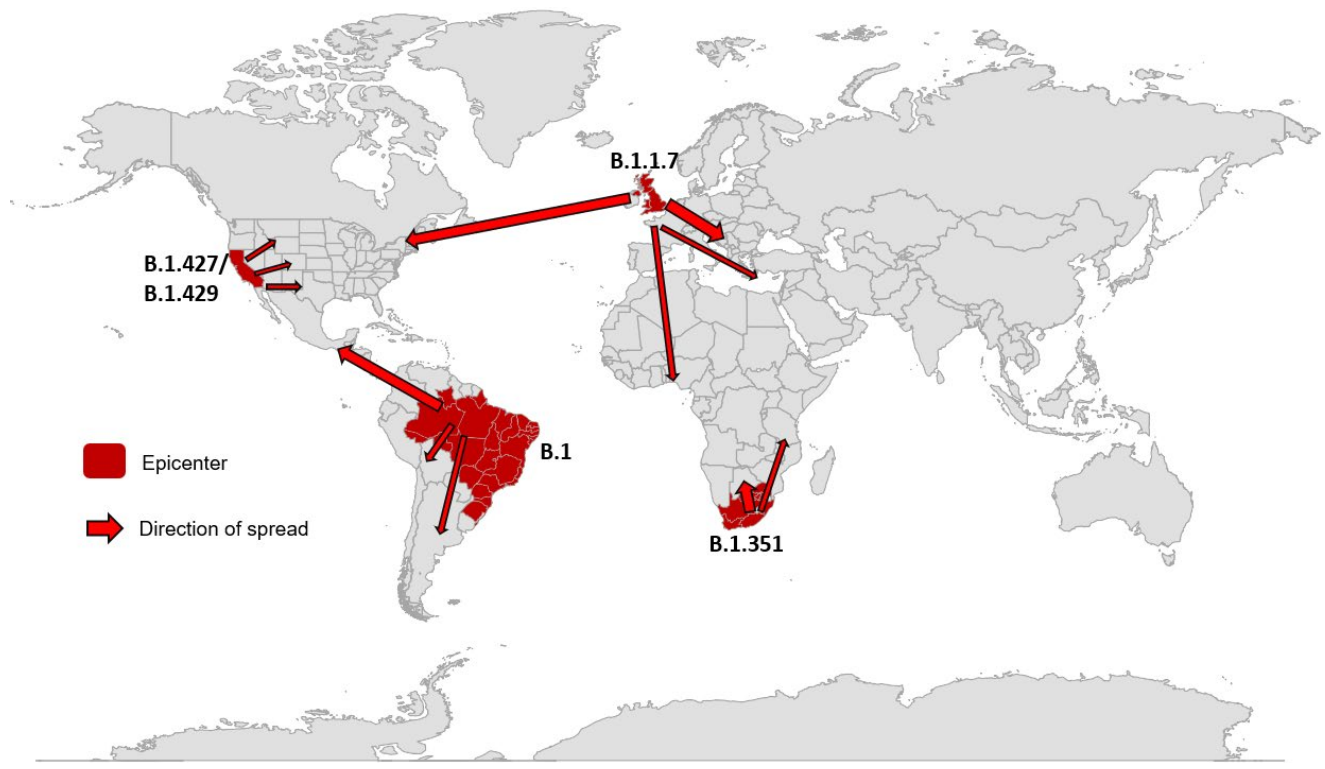
Note: Based on vaccine coverage assumptions given in Figure II.A.2, and assuming vaccine efficacy in preventing transmission is 80 percent of efficacy in preventing illness as given in Table II.A.1, except Pfizer BNT162/Moderna where assumed to be 90 percent of efficacy in preventing illness. Net transmissibility computed assuming that R_0 for SARS-CoV-2 is 2.9–3.7. B.117 assumed to be 56 percent more transmissible as estimated by Davies et al. (2020), giving a value of at least 4.5. Vaccination is the only intervention, and making assumptions about the levels of naturally-acquired immunity from previous infection as given in Table 3 of Mattoo and Ranna-Eliya (2021).

Production delays are inevitable, so the optimistic but inequitable outcome sketched above should more realistically be seen as the situation that might prevail at the end of 2022. Unfortunately, even this is far too optimistic, as it ignores the implications arising from the increasing detection of new SARS-CoV-2 virus variants of concern (VOC). These VOCs are a game-changer, as we discuss below, and fundamentally change all scenarios.

The Emergence of New Viral Variants

Until late 2020, a common view was that the SARS-CoV-2 virus would with the passage of time evolve to become less virulent, posing a health burden no worse than the endemic human coronaviruses that cause the common cold, although modeling indicated that this process would take many years. However, in the past few months several new variants of concern (VOCs) have emerged in different parts of the world that share one or both of the following characteristics: (i) increased transmissibility (R_{eff} is higher), and (ii) increased ability to evade antibodies and other components of the immune response (or immune evasion). All involve mutations to the spike protein that enable the virus to better attach to its target ACE2 receptor in human cells or better shield the virus from the immune system response. The net effect has been that the new variants spread more effectively than the existing “wild” variants, and in some cases are able to reinfect previously exposed individuals or to overcome vaccine-induced immune protection. These characteristics have enabled these variants to easily spread globally away from their original locations (Figure II.A.5).

Figure II.A.5. Global spread of new VOCs since late 2020



Source: World Bank staff illustration.

Note: Figure illustrates spread of known VOCs. There are likely to be others spreading which have not yet been detected or characterized.

In the short run, these mutations have two different impacts on the pandemic. Increased transmissibility makes it harder to control viral spread with vaccination and NPIs and raises the vaccination coverage that is required to achieve herd immunity. In the case of the UK B117 variant, which is 40–70 percent more transmissible than the wild variants, this is enough to make herd immunity with some vaccines impossible and require 80–90 percent coverage with the mRNA vaccines and Sputnik (Table II.A.2). It should be noted that coverage levels as high as 80 percent are in practice currently unfeasible, since the adult population is less than 80 percent in most countries and few of the leading vaccines have been approved yet for use in children. Immune evasion, as conferred by the E484K mutation found in the South African and Brazilian VOCs, directly impairs vaccine efficacy (and also naturally acquired post-infection immunity), which in turn

Table II.A.2. Impact of VOCs on vaccine efficacy and required herd immunity thresholds

Vaccine	Efficacy	R_{eff}		Herd immunity threshold (%)	
		Wild variant	B117	Wild variant	B117
Pfizer	0.95	3.0	4.7	70	83
Moderna	0.94	3.0	4.7	71	84
Sputnik	0.90	3.0	4.7	74	87
Sinopharm	0.79	3.0	4.7	84	99
AstraZeneca	0.70	3.0	4.7	95	>100

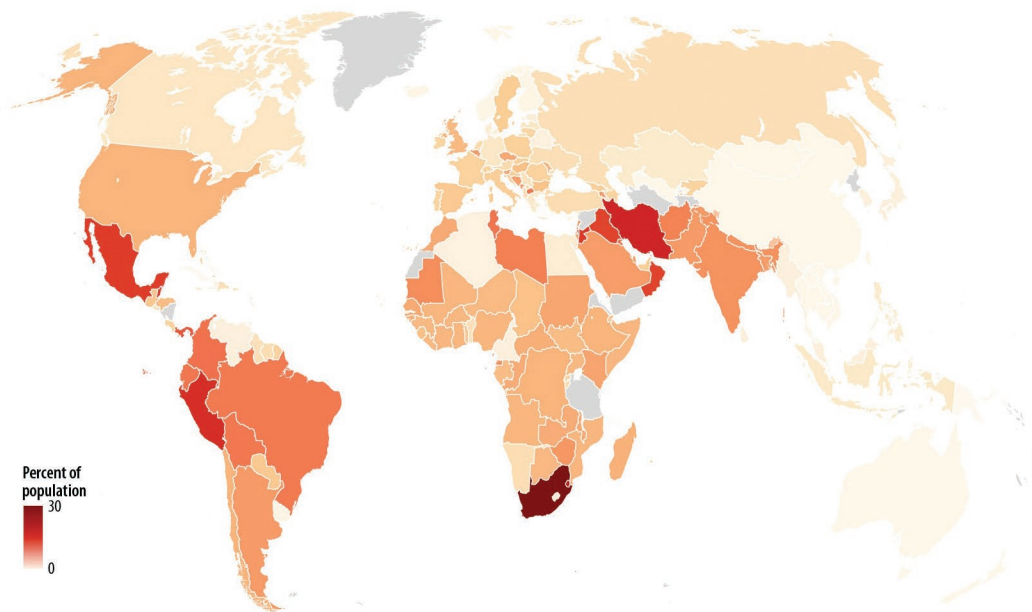
Source: Authors' analysis.

Note: Reproduction number of wild variants assumed to be 3.0, the midpoint of estimates that it lies in the range of 2.5–3.5. B117 assumed to be 56 percent more transmissible as estimated by Davies et al. (2020). Vaccine efficacies as given in Table II.A.1. Herd immunity threshold for AstraZeneca with B117 is greater than 100 percent meaning that it is not possible.

increases the vaccination coverage required to achieve herd immunity. We currently lack good estimates of how much E484K impairs efficacy of the leading vaccines, but it is possible that in combination the various mutations increase R_{eff} and reduce vaccine efficacy sufficiently that none of the currently approved vaccines can achieve herd immunity. Although vaccines can be redesigned and populations revaccinated to deal with these problems, this takes both time and money, and the challenge is whether this can be done fast enough to keep ahead of the evolving virus.

Two other aspects of the emergence of these VOCs are important. First, many of these VOCs have independently evolved the same or similar mutations, which suggests that we are seeing a process of convergent evolution that favors mutations that increase infectiousness or confer immune resistance. Contrary to many expectations, this may also lead to increased lethality since most SARS-CoV-2 transmission occurs early in the course of infection or in asymptomatic individuals. If these same mutations increase viral load, which would favor mortality, it is unlikely to impair the virus's survival and reproductive fitness. Indeed, British experts estimate that B117 infection is associated with a 40–60 percent increase in fatality. Second, these mutations were first detected in Brazil, South Africa, and the UK, all countries which had experienced high attack rates early in the pandemic and which continued to have significant levels of continuing transmission (Figure II.A.6). Additionally, the UK B117 variant appears to have evolved through multiple mutations in an individual who suffered chronic infection by the SARS-CoV-2 virus, despite acquiring partial natural and artificial immunity during the course of their illness. This leads Tulio de Oliveira and others to suggest that large pools of previously-infected individuals with declining immunity directly drives the emergence of these VOCs. When these exist alongside continuing high levels of transmission, declining individual immunity may fail to prevent re-infection and fail to rapidly clear the virus in enough people to make survival and onward transmission of any new dangerous mutations much more likely.

Figure II.A.6. Cumulative infection rates by end-2020 (percent of population infected)



Source: Authors' estimates.

Note: Chart presents estimates of the cumulative COVID-19 infection rate by end-2020, based on adjusting mortality-based estimates of cumulative infection rates for underreporting of deaths by using reported seroprevalence estimates.

In combination, these have two important global implications. First, we should assume that as long as widespread global transmission continues, evolutionary selection may drive the emergence of new variants that are even more infectious and better able to resist the immune response. This would force continuing global investment in developing upgraded vaccines and increased costs for all countries to repeatedly vaccinate their populations and control outbreaks by new VOCs. It will also necessitate substantial global investment in genomic sequencing capacity so that the world can quickly detect new variants and design and develop counter-measures. Second, if partial and waning population immunity facilitates the emergence of more dangerous variants, there may be significant global risks in allowing partially vaccinated or partially immune populations to coexist with significant continuing transmission, as they would function as breeding pools to incubate more infectious and immune-resistant variants.

These risks create a common global interest to reduce the level of viral transmission in all countries as much as possible and to reduce the opportunities for the virus to evolve mutations that reduce the efficacy and benefits of available vaccines.

Should Some Countries Delay Vaccination?

The benefits and costs of early mass vaccine deployment differ between countries and with time. In countries where COVID-19 control has not been achieved, like Indonesia and the Philippines, the benefits of rapid vaccination in reducing high numbers of deaths and in reducing pressure on struggling health systems will dwarf its costs. But the argument in favor of early vaccination is less clear in the case of eliminating countries,⁸ like China and Vietnam, which have succeeded in maintaining near-zero local transmission through a combination of border controls, test-trace-isolate (TTI) strategies, and other NPIs. These countries have among the lowest cumulative infection rates in the world as illustrated in Figure II.A.6. In these countries, there may be some benefits from delaying mass vaccination if they can maintain secure borders—as may be implicit in the decisions of Australia, China, and Vietnam not to rush vaccination.

Several reasons favor less haste in vaccination in these countries, which must be set against the advantages of moving quickly. First, the benefits are relatively low, because the immediate impact of vaccination in terms of reducing deaths and spread is negligible, whereas the cost of early mass vaccination, even after allowing for COVAX donations, are high. Second, waiting may allow countries to select a better vaccine mix in terms of greater effectiveness and price, since more data on vaccine efficacy in blocking transmission will become available with time, and prices may decline once manufacturers scale-up production and satisfy initial demand in high-income economies. The emergence of VOCs strengthens the incentives to delay mass vaccination.

At the same time, early mass vaccination might still have benefits for these countries. It would reduce the optimal level of border restrictions and routine testing that these countries need to maintain near-zero transmission. Modeling and the experience of several countries suggests that countries that have eliminated community transmission behind restricted borders need to maintain routine surveillance testing of around 0.5–1 tests per 1,000 people per day in order to detect outbreaks caused by border leaks quickly enough to have confidence of successful rapid suppression. Mass vaccination by reducing transmissibility of the virus, represented by the effective reproduction number (R_{eff}), would allow either a cost-saving reduction in the rate of testing, or an economically beneficial increase in business and tourist travel for the same level of risk as prior to vaccination. In addition, suppression in other vaccinating countries might lead these other countries to open their borders increasing the competitive pressures on eliminating countries to relax their border controls.⁹

⁸ We define elimination as a strategy that involves aiming at and maintaining zero local transmission for long periods of time through a combination of border controls, test-trace-isolate (TTI) strategies, and other NPIs, recognizing that occasional outbreaks owing to imported cases may occur, which are rapidly detected and suppressed to re-achieve zero local transmission. This differs from the more common suppression strategy that aims only to lower transmission to levels that allow control measures to be relaxed, while living with continuing levels of low, but non-zero, local transmission.

⁹ Eliminating countries that do not vaccinate early could still obtain some of the benefits of relaxed border controls if they enter into quarantine-free travel bubbles with other eliminating countries, for example a Western Pacific COVID-free zone, but to date such efforts have not progressed far.

How Can Other NPIs, Specifically Testing, Complement Vaccination?

NPIs and vaccines can play a complementary role in the containment of COVID-19. Although vaccines slow viral spread, countries with substantial transmission will continue to suffer a heavy toll of new cases and deaths until late in any vaccination deployment. Production and distribution lags mean that even in high income economies, vaccinating a critical mass of people will take at least till end-2021. And, as discussed above, in developing countries the date is likely to be much later.

As shown by Prof. Walensky, President Biden's new CDC Director, and colleagues, the effectiveness (and by logical extension cost-effectiveness) of all vaccines during their deployment declines substantially in the event of delays or other control measures failing to significantly suppress the transmissibility of the virus, represented by its effective reproduction number R_{eff} . If R_{eff} is kept low (1.5)—indicating that transmission is being controlled through other NPIs—vaccines with low efficacy (25 percent) are capable of producing larger reductions in the fraction of infections and deaths than vaccines with much higher efficacy (75 percent) deployed while R_{eff} is significantly higher. Their results, confirmed by Pfizer researchers, show that the ramp-up to universal vaccination with a highly effective vaccine such as Pfizer's (95 percent efficacy) would not prevent continuing significant mortality in the USA in the absence of other control measures. In developing countries, slower distribution and lower efficacy could lead to an even higher human cost if other measures are not implemented.

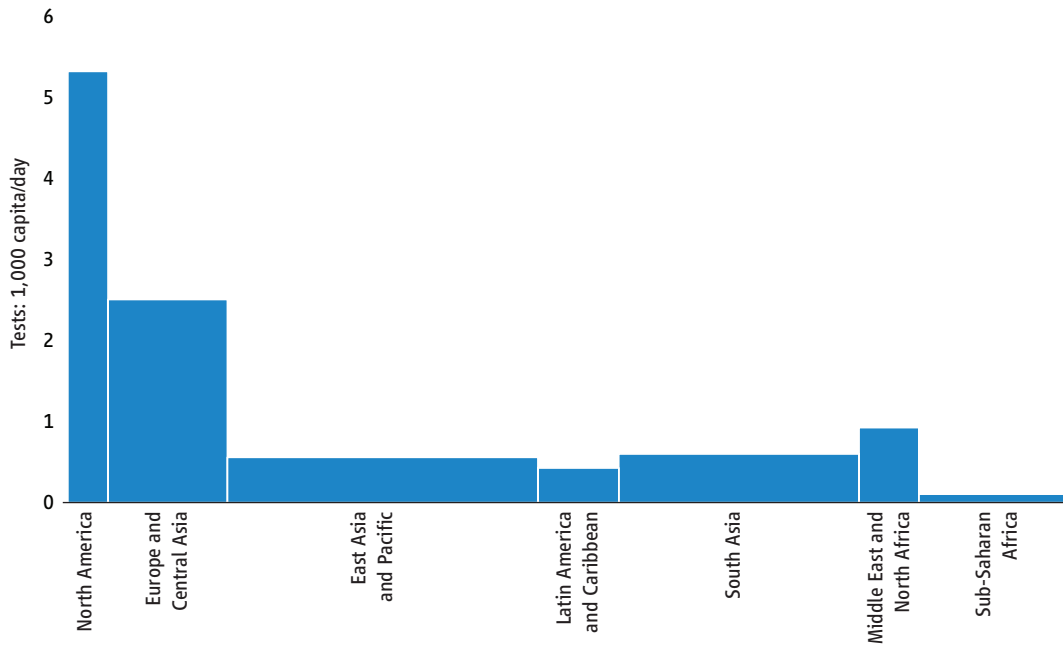
The key implication of these simulations is that countries will need to combine vaccines with continuing other measures to suppress the virus and save lives during vaccine deployment, and most developing countries that are unable to suppress R_{eff} sufficiently using vaccines will also need to continue other NPIs afterwards to maintain control of the virus. Conversely, if vaccination programs lead to a relaxation of measures by governments and behaviors by the public, the result could be a worse spread of infection, as was seen in Israel.

Of the available NPIs that can reduce transmission, lockdowns, stay-at-home orders, and restrictions on the operation of transport, schools and enterprises are the most economically and socially damaging, followed by the impact of travel restrictions on tourism in some countries. In many countries, people are also tiring of these restrictions, increasing pressure on governments to relax them. This increases the societal value of the two other major NPIs that do not impose such burdens: face-masks and testing (combined with tracing and isolation). Of these increased face-mask use is unlikely to be able to deliver the size of additional mitigation effects required, since use was already a high 64 percent globally (excluding China) by end-2020 and given evidence of only modest effects on population level transmission.

In contrast, increased PCR testing to detect new cases, coupled with contact tracing and isolation, have the potential to substantially mitigate transmission, including even achieving zero transmission. Global estimates indicate that the impact of testing on R_{eff} varies logarithmically with testing intensity, defined as the ratio of tests to new cases (TCR), with rates of 100+ tests to new cases typically associated with suppression of R_{eff} below 1. However, with reported new cases numbering 0.5–1.0 million a day, current global production of testing supplies of 7–8 million tests per day remains grossly inadequate to substantially suppress R_{eff} in most countries, partly because high-income countries consume a large part of overall global testing supplies (Figure II.A.7). But if widespread vaccination substantially reduces transmission globally, this will automatically lead to testing intensity (TCR) increasing and increases in the marginal impacts of more testing. Even then, it is unlikely that current testing capacity would be sufficient in combination with vaccination alone to suppress viral transmission sufficiently to reduce R_{eff} below 1 in most developing countries, although this might become feasible in many high-income countries that can achieve high levels of vaccination with the most effective vaccines. This

suggests that for increased testing to substitute for other more burdensome NPIs in most countries, there are two options: (i) substantial redistribution of testing supplies away from high income countries, which consumed a disproportionate 57 percent of tests during 2020, to lower-middle income and low income countries, which only accounted for 6 percent of tests globally; and (ii) a substantial increase in global production capacity of testing supplies.

Figure II.A.7. PCR testing for COVID-19 by region in December 2020



Source: IHP COVID-19 testing database.
Note: Same as Figure II.A.6, except by region.

The first option—the redistribution of testing supplies—is especially critical for regions, such as Africa, which were so starved of access to testing supplies that TTI could never have been effective in suppressing transmission. Since high-income countries are unlikely to reduce testing when faced with continued viral transmission, realistically the only way in which such a diversion of testing supplies could occur would be a scenario in which most high-income countries achieved zero local transmission, as Australia has done, which would then allow them to reduce testing rates to 1 test per 1,000 capita/day or lower, which appears sufficient to maintain zero local transmission in combination with border controls.

The second option—increasing the global supply of tests—requires substantially accelerating the expansion of global production of Real-time polymerase chain reaction (RT-PCR) kits and in particular Ribonucleic acid (RNA)-extraction kits, which appear to be more of a bottleneck, as well as of RT-PCR testing machines, of which automated, high volume systems are most needed to ramp up testing in many countries. The pandemic has seen a huge increase in global production, with many new manufacturers and countries starting production, but China is the major global producer of test kits, accounting for 50–70 percent of total production, probably owing to economies of scale and low production and supply chain costs.

However, many firms, especially original equipment manufacturers (OEMs), hesitate to scale up production faster, owing to significant risks in investing in new production lines given uncertainties over future market demand, which are only

likely to increase given the possibility that vaccines might reduce demand for testing supplies. In this context, there would be huge global benefits in facilitating the mostly Chinese producers to expand production by providing long-term purchase guarantees or by directly subsidizing their investment in production capacity. Such measures have already proved effective in this pandemic, as demonstrated by the approach that the US government used to boost vaccine development and production, exercising emergency powers granted by its Defense Production Act (DPA).

Finally, it should be noted that the benefits of increasing investment in TTI will also be dependent on the effectiveness of contact tracing and the ability of authorities to ensure that cases and contacts comply with isolation requirements. For many people, especially in lower-income countries, compliance with isolation is difficult owing to the need to maintain incomes and livelihoods, so a more effective TTI response may require many governments to spend more on human resources for tracing and on income transfers to support people in isolation.

When Is Global Cooperation Both Desirable and Feasible?

The difficulties in preventing viral spread across borders and the emergence of the VOCs mean that unless the pandemic is controlled everywhere, it is definitively controlled nowhere. Hence, there is a global public goods argument for global action to suppress the emergence of new, more infectious variants. Since the rate of emergence of these variants under evolutionary pressure is a function of the total incidence and possibly also the existence of partially immune populations, global assistance and investments would go where the virus would have the greatest impact in terms of suppressing incidence. Thus, there may be a global welfare argument for holding back on vaccination programs in countries that have contained the disease with near zero local transmission and allocating limited global supply to populations with the highest transmission. But when would such restraint be both required and in the national interest? We consider in turn the mismatch between access to vaccines and need across countries, the benefits to a country of vaccination abroad, and sufficient conditions for the existence of a global cooperative solution.

• How big is the mismatch between access and need?

How much we need global cooperation depends on how big the mismatch is between the international distribution of the vaccine and the need for it. Two types of mismatch could arise across countries. One is between the distribution of the vaccine and the distribution of the virus, which matters when vaccination is a means of disease suppression. On this dimension, there would seem to be less of a mismatch because many of the countries that have procured or produced the most vaccine are also the ones that have experienced the highest mortality: the United States and Europe. However, this is deceptive because there is a large mismatch between the efficacy-adjusted distribution of vaccines, which is concentrated in those same countries, and overall rates of infection and likely viral transmissibility which are highest in Latin America, South Asia and Africa (Figure II.A.6).¹⁰ The other type of mismatch is between the distribution of the vaccine and the distribution of population, which matters because vaccination is ultimately meant to offer protection against the disease. On this dimension, there is more clearly a North-South divide. The high-income countries have secured more than enough vaccines with relatively high efficacy while many middle and low income countries are still struggling to procure enough vaccines even for the more vulnerable groups.

¹⁰ Officially reported case numbers are a poor measure of the underlying COVID-19 burden, since most infections are never tested or diagnosed. So, we developed estimates of underlying infection rates by using published estimates of national infection rates based on an analysis of reported deaths, and adjusting these for potential bias arising from underreporting of deaths by analysis of infection rates reported from representative seroprevalence surveys in different countries.

• Benefits from vaccination in the rest of the world

Any single country derives benefits from global vaccination for two broad reasons. First, vaccination allows an economic revival in the rest of the world and hence boosts international trade for each country. Conversely, continued pandemic-related economic difficulties in the rest of the world are a drag on the recovery of a country that has successfully implemented domestic vaccination. The country's exports cannot fully recover because external demand remains weak and its production is constrained by shortages of imported inputs. Çakmaklı et al. (2021) estimate the potential costs of inadequate vaccination outside advanced countries, using an economic epidemiological model of international production and trade networks and calibrate the model to 65 countries. Their estimates, based on stylized scenarios, suggest that up to half the global economic costs of the pandemic in 2021 would be borne by the advanced economies even if they achieve universal vaccination in their own countries but developing countries do not. The GDP loss from not inoculating all the countries, relative to a counterfactual of global vaccinations, is also shown to be higher than the cost of manufacturing and distributing vaccines globally. Even if the assumptions in the study are relaxed, the basic conclusion is likely to hold: advanced countries would reap significant trade gains from the economic revival that could result from mass vaccination in developing countries.

The second reason for a country to benefit from vaccination abroad is that it can lower its optimal restrictions on travel in a safer world. These optimal restrictions balance the potential health risk of openness against the social and economic benefits. A reduction in infections abroad and a lower risk of allowing new VOCs to enter would imply lower optimal border controls. One result would be a revival in tourism, which accounts for a large share of the exports of many countries and which has therefore been hit hardest by the pandemic. For example, some of the Pacific Island Countries where tourism accounts for most of export earnings have seen GDP decline by more than 10 percent. Apart from leisure tourism, renewal of business travel would allow in-person meetings, which remain important for negotiating deals and help boost trade and investment. Face-to-face communication may also be important for the transfer of technology. For example, Hovhannisyan and Keller (2015) show that an increase in business travel leads to an increase in patenting, and inward business travel is about one fourth as potent for innovation as domestic R&D spending.

• When is global cooperation in vaccine allocation feasible?

The case for global vaccination or equity in vaccine access has typically been made on ethical grounds. The arguments presented above suggest that industrial countries should make vaccines available to developing countries out of self-interest rather than generosity. However, such advice has found only limited resonance in national strategy, which in most countries has favored maximizing the speed of domestic vaccination. One exception, of course, is cooperation as part of the COVAX initiative, which has set as its initial ambition the vaccination of 20 percent of the populations in all developing countries. But despite its remarkable achievements, this is still quite a modest level of global cooperation that imposes only trivial costs on the most advanced economies. In practice, in a situation where global elimination of the virus to prevent the emergence of new VOCs is not the shared goal or feasible outcome, rational self-interest of most nations aligns with maximizing their own access to vaccines first.

If advice for more ambitious international cooperation is to influence policy, it is necessary to identify and also to create the conditions under which international cooperation is both desirable and feasible. The central question is: when would it be in the national interest to support vaccination and pandemic control in other countries before or alongside vaccination at home? We also note that unless the issue of national self-interest is addressed, it would be difficult for most governments to have domestic support for alternative strategies.

While the North-South divide matters, in this context the more relevant divides are between the countries that have reduced domestic suppression (Australia, East Asia) and those that have not (especially the United States, Europe, and Latin America), and between the countries that have significant capacity to support production of vaccines and testing supplies and those who do not. How feasible international cooperation is depends on the global availability of the vaccine and expected efficacy against new variants of the virus, as well as the availability of supplies for other NPIs, especially testing. As discussed below, relatively limited availability of vaccines and high expected efficacy against new variants favor national vaccination strategies. Cooperation will only be sustainable when there are enough vaccines and testing supplies to make global elimination realistic and while effectiveness against new variants is not so high that national vaccination offers adequate insulation.

Three broad situations could arise. (1) A country has enough vaccines with sufficient efficacy to insulate its people against existing and emerging variants. (2) No one country has enough vaccines with sufficient efficacy, but the global availability of vaccines (and NPIs) is sufficient to control the spread of infection globally. (3) Neither condition (1) nor condition (2) is fulfilled.

Situations 1 and 3 lead to a non-cooperative equilibrium where each country goes it alone and vaccinates its own people to the extent feasible. Situation 2 leads to a cooperative equilibrium in what is referred to as an “assurance game.”¹¹ Such a game arises in a situation where no single country can provide sufficient vaccines and testing supplies to achieve global suppression if they contribute alone. Therefore, for each country, if the others do not contribute then it would also not contribute. But if the others contribute, and if their collective efforts are enough to make global suppression feasible, then each country would prefer to contribute as well. In this respect, the assurance game differs from the more familiar Prisoners’ Dilemma, in which not cooperating is the dominant strategy for each player and the socially desirable cooperative equilibrium is only attainable if there is an enforcement mechanism. There does, however, remain the need for an international mechanism to coordinate national actions.

To take a more dynamic perspective, we can think in terms of two races: expanding the global production of more effective vaccines to cope with a constantly spreading virus; and expanding the variety of vaccines to deal with emerging virus variants. The first race requires rapidly scaling up the production of vaccines that have already been developed and are being developed. The second race may be harder to win because the virus may evolve faster than our ability to detect new variants, identify them as candidates for vaccine targeting, and develop and deploy new vaccines—which could imply continuing expenditure for years into the future, even if marginal costs fall. Winning the first race and cooperating to distribute the vaccine where it can suppress infection faster and slow down mutation would allow more time to develop updated vaccines and make it more likely that we will win the second race. The UK’s recent order of 50 million doses of new vaccines for new variants suggests that waging this battle unilaterally could lead to an infinite regress where new vaccines are forever chasing new variants.

Whether the conditions for a cooperation equilibrium are fulfilled is not exogenously given but depends on policy choices. Upstream cooperation between countries to increase production of more effective vaccines and complementary NPI products, like testing equipment, can help create the conditions for downstream cooperation in allocation. Currently, there are domestic constraints and gaps in international cooperation. For example, China could scale up and export more vaccines if their efficacy were more transparently established (e.g., through publication of the evidence in a peer-review journal) and if a better balance were struck between public safety and production efficiency in vaccine regulation (Box II.A.1). Internationally, German management and production skills could combine with Russian vaccine technology to significantly scale up production of more effective vaccines, while Indian production capacity could be redeployed to focus on production of more effective vaccines. One can conceive of similar international cooperation and investment to exploit China’s capacity to produce various NPI products. Further, an effective vaccine global elimination strategy would be unable to optimize allocations of scarce vaccines without an end to zero-sum vaccine competition.

¹¹ Michael Taylor. 1987. “The Possibility of Cooperation,” Cambridge University Press, Cambridge.

Box II.A.1. China's COVID-19 vaccines^a

As of February 24, 2021, there are 11 vaccines approved by at least one country, of which four are produced by China's institutions (Table II.A.B1.1).

Table II.A.B1.1. China's COVID-19 vaccines approved by at least one country

	<i>Clinical trials</i>		<i>Results published in medical journal</i>	<i>Approvals (as of Feb 24, 2021)</i>
	<i>Phase I and II</i>	<i>Phase III</i>		
Sinopharm-Beijing (2 doses)	China	Bahrain, Egypt, Jordan, United Arab Emirates, Peru, Argentina	Phase I/II published ^b Phase III not yet	Bahrain, Cambodia, China, Egypt, Hungary, Iraq, Jordan, Morocco, Nepal, Pakistan, Peru, Republic of Serbia, Seychelles, United Arab Emirates
Sinovac (2 doses)	China	Chile, Brazil, Indonesia, Turkey, China	Phase I/II published ^c Phase III not yet; Sinovac confirmed that Phase III would be published by each sponsor for each trial	Brazil, Chile, China, Colombia, Indonesia, Lao PDR, Mexico, Turkey, Uruguay, Thailand, Philippines
CanSino (single dose)	China	Argentina, Chile, Mexico, Pakistan, Russia	Phase I/II published ^d Phase III not yet	China, Mexico, Pakistan
Sinopharm-Wuhan (2 doses)	China	Bahrain, Egypt, Jordan, United Arab Emirates, Peru, Morocco	Phase I/II interim report published ^e Phase III not yet	China, United Arab Emirates

Source: World Bank staff analysis.

Six vaccines from China are included in the list of the WHO Emergency Use Listing evaluation process. The anticipated decision date would be March at the earliest for Sinopharm and Sinovac.^f As far as the stringent regulatory authority (SRA) approval is concerned, in the case of Sinovac the process is as follows: (i) planned and in progress with European Medicines Agency (EMA); (ii) had a pre-discussion with EMA, and will soon submit application for EMA scientific advice meeting; and (iii) considering the current strict quarantine requirement in China, the EMA process will take at least a couple of months to complete since it also requires site inspection even if they are on WHO EUL. Sinopharm received approval in Hungary, which is one of the SRA countries.

As far as the **production capacity** is concerned:

- **Sinovac:** The current capacity for producing the active pharmaceutical ingredient is close to 1 billion doses per year and will be further expanded around mid-2021. The bottleneck is on filling and packaging. Specifically, Sinovac has limited capacity for finished products: originally only around 150 million doses; has started building the second filling and packaging line to double capacity for finished products but the process will take a few months. Therefore, Sinovac is interested in working with the countries which can do local filling and packaging. See below on why China's manufactures do not produce multi-dose vials, which is a common practice globally.

(continued)

(Box II.A.1. continued)

- **Sinopharm:** The capacity is also expanding rapidly.
- **Nationally,** 18 production lines for COVID-19 vaccines have been established. The aggregate annual COVID-19 vaccines production capacity is expected to reach 2 billion doses by the end of 2021.

To meet the demand of mass vaccination, global manufacturers typically produce multi-dose vials. For instance, the Pfizer-BioNTech vaccine contains 5–6 doses per vial, Moderna 10 doses per vial, AstraZeneca 8 or 10 doses per vial. However, China’s manufactures only produce single-dose vials. There are two main reasons.

First, the clinical trials were conducted using single-dose vials. Even if multi-dose vials are produced only for export, the manufacturer needs to conduct an additional bridging study under China’s regulation because preservatives need to be added for the multi-dose vials. WHO/COVAX have not yet requested Sinovac to conduct such a study, presumably because the vaccine has not yet received regulatory approval.

Second, though multi-dose vials are more cost effective in general, they also pose more safety risks from mishandling by health care providers. The China Vaccines Administration Law that came into effect in December 2019 does not have any explicit regulation requiring single-dose vials, but given past safety problems, manufacturers and health care providers in China stick to the single-dose vial because it poses less regulatory and health risks. In this context, manufacturers have in some instances chosen to export the active pharmaceutical ingredient to factories in other countries for filling and packaging into multi-dose vials. For instance, Butantan (Brazil) and Biofarma (Indonesia) fill and package 10 dose vials for Sinovac.

As of February 17, 2021, China had exported vaccines to 22 countries, with Cambodia, Indonesia, Lao PDR, Mongolia, the Philippines, and Thailand among the beneficiaries.

^aBased on information from WHO (2021).

^bXia, Duan et al. (2020).

^cFor 18–59 years old, Zhang et al. (2020), and for 60 and above, Wu et al. (2021).

^dZhu et al. (2020).

^eXia, Zhang et al. (2020).

^fStatus of COVID-19 Vaccines within WHO EUL/PQ evaluation process, WHO (2021).

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Part II.B. The fiscal policy response to the COVID-19 shock

Overview

Fiscal policy today is expected to play a demanding triple role of supporting relief, recovery, and growth. Relief is needed to help households smooth consumption and help firms avoid bankruptcy or damaging contraction. Recovery requires a fiscal stimulus because the COVID-19 shock threatens to lock the economy into an underemployment equilibrium. Growth requires public investment in both hard and soft infrastructure. The evidence so far suggests that in many EAP countries, relief is less than earning losses, stimulus has not fully remedied deficient demand, and public investment is not a significant part of recovery efforts.

How far do government choices reflect constraints on borrowing and spending? As governments committed to fiscal support equal to nearly 10 percent of GDP in 2020, public debt increased on average by more than 7 percent of GDP. The fact that interest rates have been significantly lower than growth rates for EAP countries suggests that even large primary deficits may not threaten debt sustainability. However, governments for good reason do not see the wedge between growth and interest rates as a license for unlimited borrowing. The differential is not stable and has been subject to reversals in sign; interest rates are not exogenous but sensitive to high fiscal deficits and debt; markets can be spooked by vulnerabilities like foreign currency debt, overvalued exchange rates, financial system fragilities and commodity dependence; and higher debt service and low revenue generating capacity in EAP countries can crowd out public investment, hurting recovery and growth.

Countries, therefore, face trade-offs as they balance the continued need for economic support against the risk of future instability. The trade-offs could be softened.

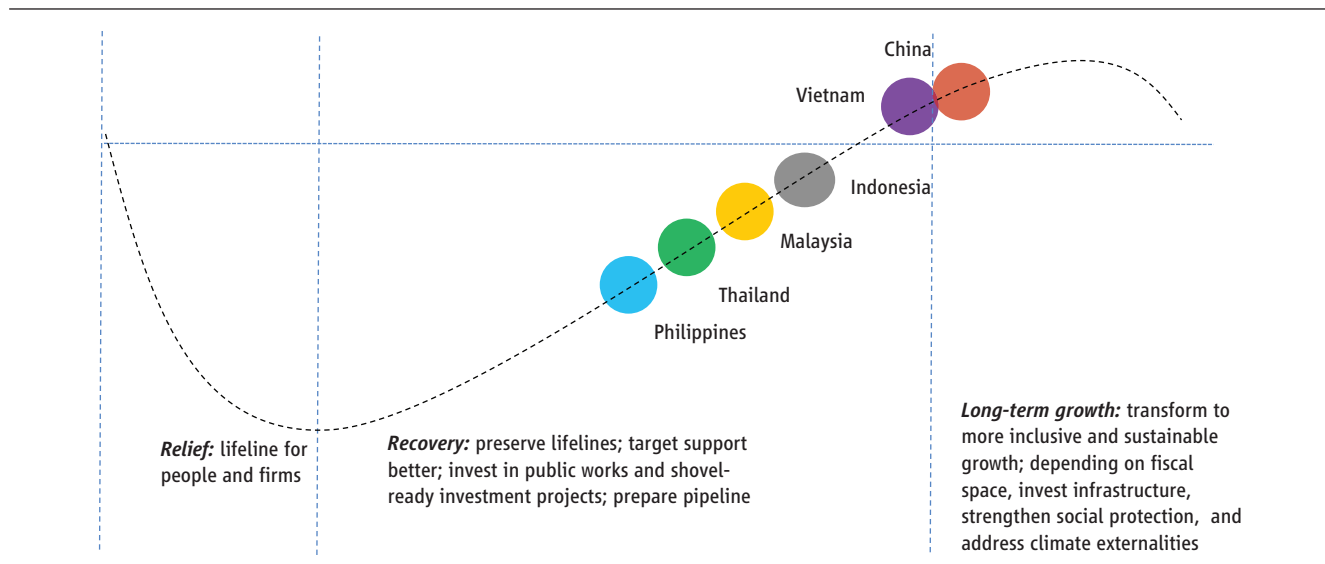
- First, governments in the EAP region can do much to increase the efficiency of expenditure. Now that recovery is underway, support to households and firms could be better targeted. In Indonesia, Mongolia, and the Philippines, households whose incomes were unchanged during the crisis were almost as likely to receive assistance as those who suffered income losses. Similarly, in Cambodia, Indonesia, Malaysia, and Vietnam, the likelihood of a firm receiving support was not related to whether it was affected by the crisis. Looking ahead, investment spending can be streamlined and allocated where the social rate of return is highest. Returns are four times higher in countries with better public investment management.
- Second, rather than curtail spending or raise taxes prematurely, governments can credibly commit to future discipline and efficiency-enhancing reforms. Some countries have started drawing fiscal consolidation plans, which involve eventually lowering spending and/or increasing revenues, including through the reintroduction of a fiscal rule. They could also commit to phasing out wasteful and regressive spending. For example, fuel subsidies account for as much as 0.25 percent of GDP in China, 0.30 percent in Indonesia, 0.50 percent in Vietnam, and 1.30 percent in Malaysia. While raising revenue and cutting spending during a crisis is difficult, legislating future reforms may be politically easier—because opposition from vested interests is likely to be weaker when they are benefitting from government support and bailouts.

- Third, EAP countries can continue to use monetary policies to share the burden of economic support because their interest rates are positive, reserves requirements relatively high, and inflation subdued.
- Fourth, international coordination could magnify the collective impact of fiscal policy because governments tend to underprovide stimulus relative to the global optimum due to demand leakages. China, which has ample fiscal space and a current account surplus, could do more to boost domestic demand. Since returns to public infrastructure investment are declining and corporate debt levels are high, a greater emphasis could be placed on targeted transfers and other fiscal measures to boost consumption. An in light of growing climate risks, public investment to accelerate the transition to a low-carbon development path could have high social returns and also generate short-term employment gains.

Fiscal Policy Priorities

Governments in the region are relying heavily on fiscal policy to mitigate the impact of the crisis. Fiscal policy is expected to play a demanding triple-role of supporting relief, recovery and growth. The relative weight on different roles depends on the state of the economy (Figure II.B.1). Relief is needed to help households to smooth consumption and firms to avoid bankruptcy or damaging contraction. Recovery may require a fiscal stimulus because the COVID-19 shock threatens to lock the economy into an underemployment equilibrium. Growth may require public investment to improve the hard infrastructure of roads, ports, and cables and the soft infrastructure of schools and hospitals, as well as to facilitate transition to a more sustainable and inclusive growth.

Figure II.B.1. The primary focus of fiscal policy depends on the state of the recovery



Source: World Bank staff illustration.

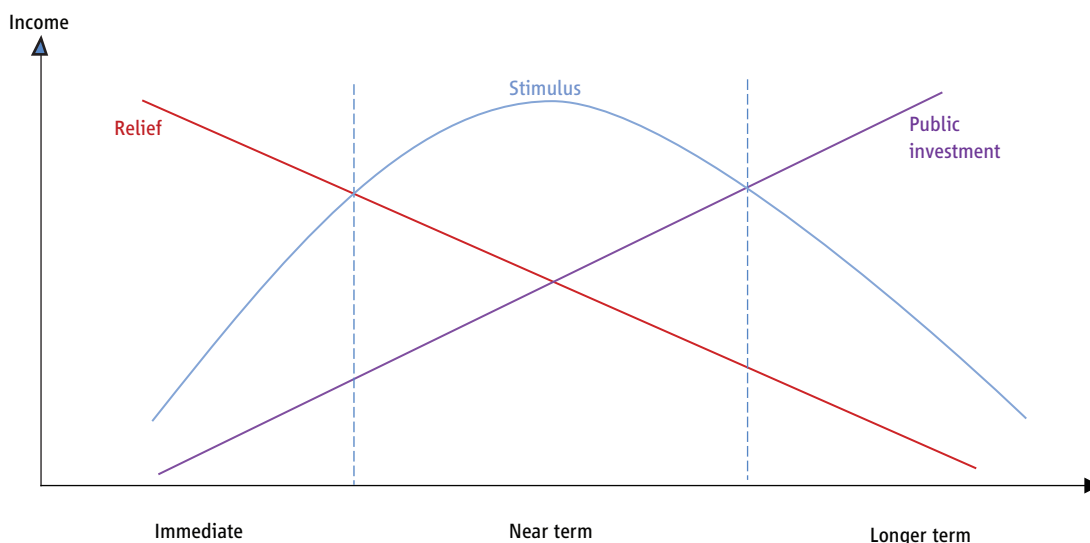
Note: The horizontal line indicates GDP relative to December 2019.

Some aspects of these goals are complements but others are conflicting. For example, relief could also contribute to recovery and growth. Transfers to households and firms will boost demand and spur economic activity. At the same time, helping households avoid erosion of human capital and helping firms avoid a permanent loss of intangible assets are

investments in growth. Similarly, stimulus could boost not just current demand but also provide relief by generating jobs and boost growth by keeping firms in business. However, trade-offs will also exist between goals. Some relief would necessarily support consumption rather than investment. Some spending may have weaker multiplier effects than other spending. Including investment in a stimulus package may delay its implementation and dilute the impact on current income.

The impact of relief is greatest on incomes while the pandemic-related restrictions and precautions curtail demand and supply (Figure II.B.2). As the pandemic is contained and restrictions become less severe, policy support through stimulus spending on public works and shovel-ready projects provides a higher marginal boost to incomes. Over the longer term, fiscal support for public investment projects, some of which have long gestation periods, leads to a bigger increase in incomes.

Figure II.B.2. The impact of relief on aggregate income is biased toward the present, whereas the impact of public investment is biased toward the future



Source: World Bank staff illustration.

Relief

Earning and employment losses in the region’s economies remain large (see Part I), ranging from an estimated 3 percent of gross domestic income in Vietnam, to close to 8 percent of gross domestic income in the Philippines (Figure II.B.3). Losses may be underestimated because we do not capture all the households and firms in the informal sector. In comparison, fiscal support to households provided by governments remains lower than the estimated earnings losses in Indonesia, Malaysia and the Philippines, but may have overcompensated in Mongolia. Furthermore, support to households was through temporary programs which have expired or are about to expire in many countries (Box II.B.1 and Box II.B.2). While misery persists, additional fiscal support may be needed to buttress disposable incomes.

Figure II.B.3. Support to households and firms was lower than estimated earning losses in the majority of the region's economies

Sources: Haver Analytics; World Bank staff calculations.
 Note: Earnings losses are calculated as loss in employment multiplied by changes in wages.

Box II.B.1. How well are governments' COVID-19 responses reaching those in need in East Asian and Pacific countries?

Countries in East Asia and the Pacific have mounted unprecedented fiscal responses to the pandemic. But how well have these responses reached those most affected by the crisis? High frequency survey data collected from firms and households in the region provide some insights.

The targeting and reach of government support to firms could be improved. Business Pulse Survey data from Cambodia, Indonesia, Malaysia, and Vietnam reveal that the likelihood of a firm receiving support was not related to whether it was affected by the crisis (defined as having lost sales the month preceding the survey, compared to the previous year). In Vietnam, initial support to firms that were not affected slightly exceeded support to affected firms (Figure II.B.B1.1). Larger firms were almost 20 percentage points more likely to receive support. Fiscal efficiency dictates targeting support to firms that need it and that are likely to be viable post-COVID-19. Policy instruments need to be finetuned to match firms' preferences. Nearly 80 percent of firms that preferred tax relief as a form of support received it, but the corresponding proportion was only 10 percent for grants and subsidies.

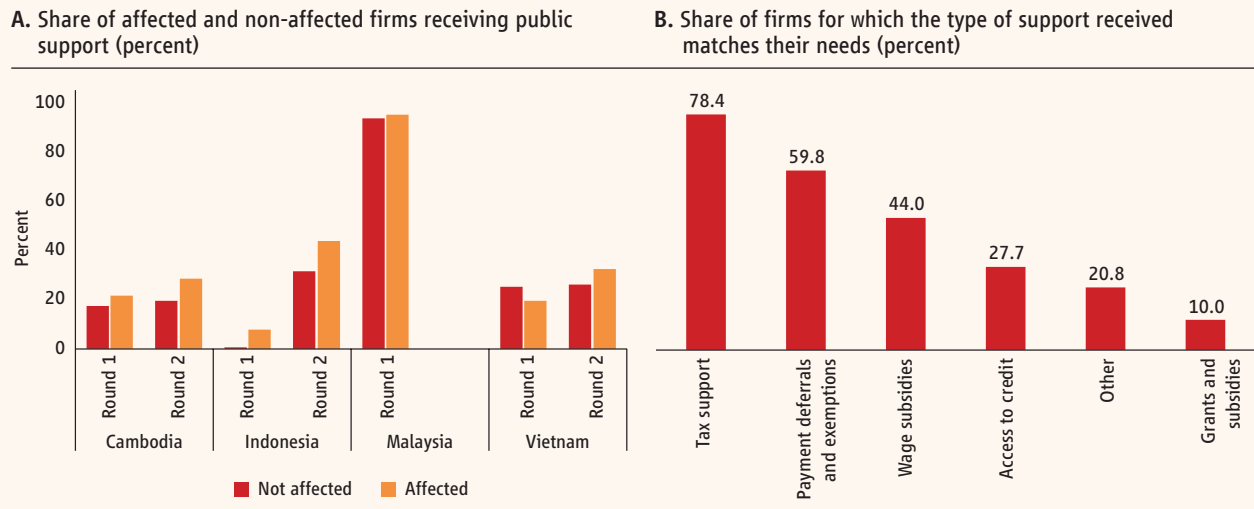
High-frequency phone survey (HFPS) data from households in Cambodia, Indonesia, Mongolia, and the Philippines indicate a scope for improved targeting of support to households as well. Coverage of households by government assistance increased during the pandemic, as countries put in place—or strengthened—delivery systems for COVID-related relief (Box II.B.2). Countries' support to households has generally been pro-poor, in the sense of reaching a higher share of poorer households than those in the middle or upper parts of the distribution (Figure II.B.B1.2).¹² Countries were less successful, however, in targeting households that experienced COVID-19-related income shocks. Indeed, the share of households receiving assistance does not differ significantly between households that reported a COVID-19-related income shock and those that did not. Only in Cambodia—where household assistance was more limited and finely targeted than in Indonesia, Mongolia, and the Philippines—did households experiencing income losses receive a relatively higher share of support.

(continued)

¹² In Mongolia, where part of the government's response relied on topping-up the Child Money Program—a universal child benefit—the differences in coverage across welfare categories is more muted than in other countries that relied, at least in part, on targeted social assistance.

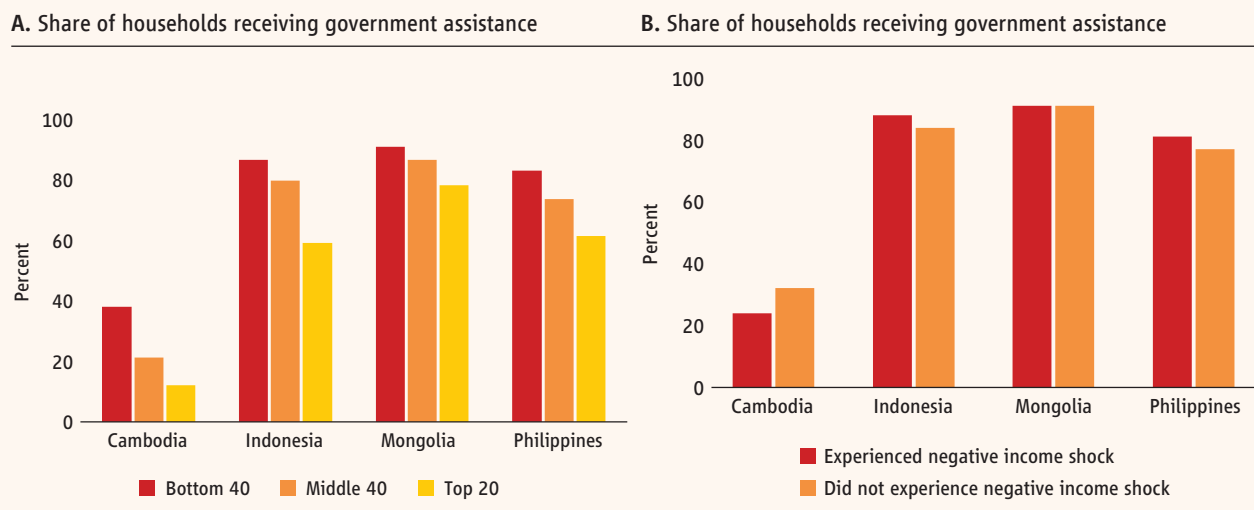
(Box II.B.1. continued)

Figure II.B.B1.1. Government support to firms has risen during the pandemic, although coverage has been uneven and targeting could be improved



Source: Business Pulse Surveys.
 Note: Round 1 refers to June–July for Cambodia, June for Indonesia and Vietnam, October for Malaysia. Round 2 refers to September for Cambodia, September–October for Vietnam, October for Indonesia.

Figure II.B.B1.2. Support has reached poor households, but also those less in need



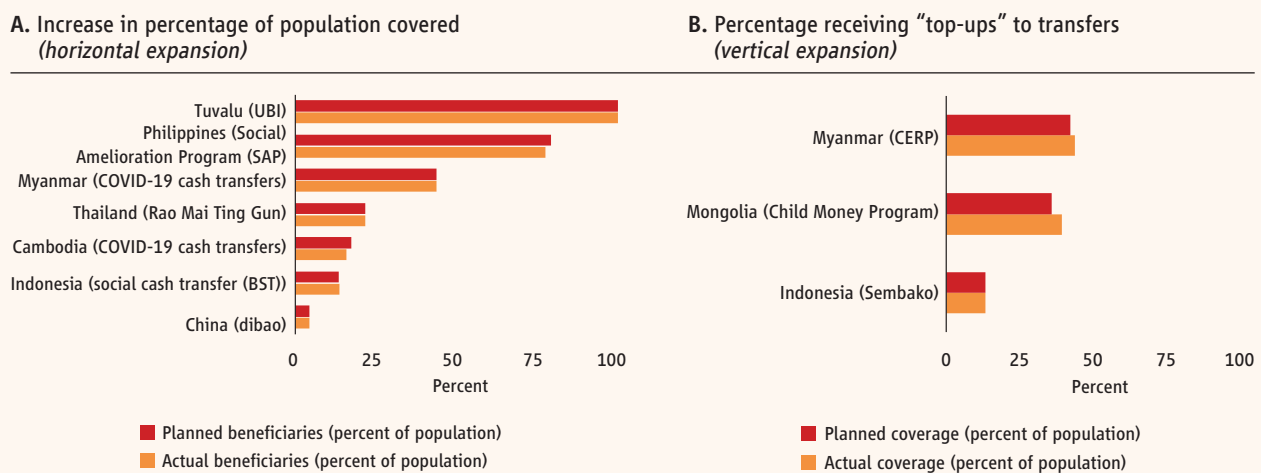
Source: High-frequency phone surveys.
 Note: Data for Cambodia from August 2020; Indonesia, July 2020; Mongolia, December 2020; the Philippines, August 2020.

Box II.B.2. EAP countries' social protection responses to COVID-19

As discussed in detail in the October 2020 EAP Update, policy makers in the region mounted an unprecedented and multifaceted social protection response to the COVID-19 crisis. Governments used an array of instruments, from cash transfers and other social assistance programs to protect poor, vulnerable, and informal sector workers, to social insurance for formal sector workers, to labor market interventions to protect jobs and reskill workers. Countries scaled up existing programs and launched new ones to expand social protection coverage (sometimes referred to as “horizontal expansion”) and sometimes raised benefit levels of existing programs (“top-ups”) to increase their protective power (sometimes referred to as “vertical expansion”). Although East Asian and Pacific countries have traditionally been low and reluctant spenders on social protection, many countries in the region have doubled—and some have even tripled—their spending in response to the crisis (World Bank 2020c).

Having existing social protection programs and sound delivery systems in place is critical to most rapid and effective scale-up during crisis. In Mongolia, high pre-COVID-19 coverage rates enabled the government to focus on providing crisis-related top-up payments through existing programs. Evidence from the Philippines shows that the *Pantawid Pamilyang Pilipino Program* (or 4Ps)—the country’s flagship conditional cash transfer program (pre-COVID)—played an important role in protecting beneficiary households against food insecurity. Furthermore, some of the early challenges countries faced in implementing their social protection responses have been surmounted over time, as program implementation proceeded. Most countries in the region—with a few exceptions—have achieved (or come close to achieving) their stated targets with respect to both horizontal and vertical expansion (Figure II.B.2.1). These findings, often based on government administrative data, are consistent with results from high frequency phone surveys in several countries.

Figure II.B.2.1. Most countries in the region have achieved (or come close to achieving) their stated targets with respect to both horizontal and vertical expansion



Source: World Bank staff calculations, based on data from Gentilini et al. (2020).
Note: Includes selected programs covering more than 2 percent of the population.

(continued)

(Box II.B.1. continued)

One emerging challenge that countries in the region face is how to ensure adequate protection to those that need it, as the pandemic continues. Much of countries' social protection responses were originally designed to have a limited duration. For example, the majority of cash transfer programs implemented in response to COVID-19 were designed to end after 3 months. Only a few were designed to last longer; and none were originally envisioned to operate for more than 6 months (Gentilini et al. 2020). In principle, these time limits make sense, as governments do not want to spend scarce public resources once households have emerged from the crisis, and they do not want transfer payments to disincentivize a return to work once the crisis has passed. But, even as some aggregate economic indicators have begun to rebound, many households still face considerable challenges with respect to employment and earnings.

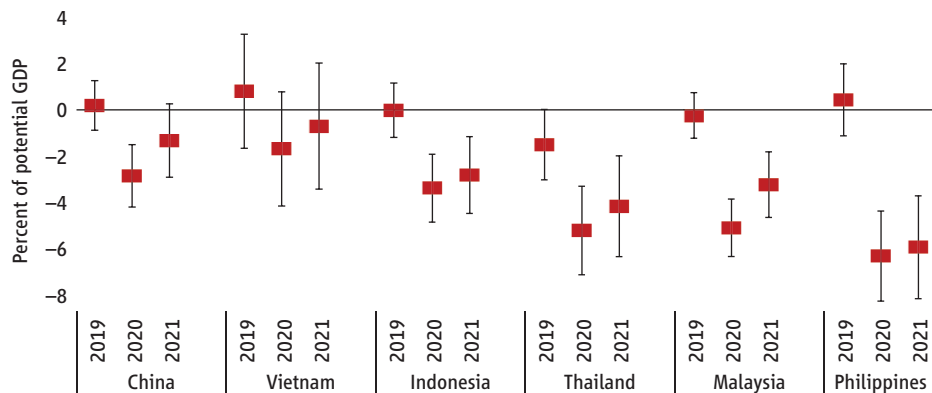
In response to these prolonged employment and income effects, policy makers in several countries have extended—or plan to extend—their social protection responses. In Indonesia, for example, the original expansion of its flagship social assistance program has been extended through 2021. In Cambodia, Mongolia, and Thailand, the share of the population that will receive payments in the first quarter of 2021 is similar to the share that received benefits in 2020. Benefit levels in Cambodia have remained unchanged, whereas in Thailand the government has kept the programs running but reduced the benefit size from 5,000 to 3,500 Baht per month. While the Cambodian program has been extended through March 2021, the Government of Thailand only committed to continue support through the end of February. Benefits in Mongolia have been extended at the same level through June 2021, making them the most generous in the region for 2021. As of January 2021, the scope of planned cash transfers in Malaysia and the Philippines for 2021 appeared to be much more modest than in 2020 (World Bank forthcoming).

Governments now face sharp trade-offs. On the one hand, ending programs or reducing benefit levels may help to reduce the fiscal costs, but it could also result in increased poverty and lower household investment in health and education. On the other hand, extending social protection programs and maintaining benefit levels will afford needed protection, but will also result in greater fiscal pressures.¹³

Recovery

Despite the generous relief packages, the output shortfall, i.e. the gap between actual and potential output, remains significant in most countries (Figure II.B.4; Box II.B.3). The estimated deficiency in demand is likely to persist during 2021 in most of the countries for which high-frequency data are available. Support provided by governments would ideally be calibrated to the size of deficient demand and also remedy any supply limitations. However, support in economies hardest hit by the pandemic remains below the estimated deficiency in demand (Islamaj, Ruch, and Vashakmadze 2021). Supply and demand shocks are likely intertwined and what starts as a supply shock—lockdowns, layoffs, and firm exit—can lead to a demand shock (Guerrieri et al. 2020).

¹³ Recent review of how governments in East Asia and the Pacific have financed their social protection responses to COVID-19 found that most countries have funded expanded programs through internal budget reallocations or by increasing deficit spending—although at least a couple of countries (Fiji, Indonesia) have taken on multilateral debt to finance their social protection responses (Almenfi et al. 2020; World Bank forthcoming).

Figure II.B.4. Output gap estimates suggest a deficient demand environment

Sources: Haver Analytics; World Bank.

Note: The output gap is based on estimates from a modified multivariate filter model of World Bank (2018). Data available to 2020-Q4. Ranges reflect 90 percent confidence bands. Weighted average based on 2019 GDP at 2010 prices and exchange rates.

Box II.B.3. Determining the size of deficient demand in East Asia

The region saw a significant widening of the output gap—the difference between what an economy is producing and what can be efficiently produced at the existing capacity—in 2020, with a collapse in consumption, generally low inflation, and elevated unemployment rates.¹⁴ While the output gap is expected to narrow in 2021, it is likely to remain negative in the hard hit economies of Indonesia, Malaysia, Thailand, and the Philippines.

The region registered an output gap of around negative 3.0 percent of potential output in 2020, more than three times larger than the output gap during the global financial crisis. Output gaps in EAP are expected to narrow to negative 1.7 percent of potential output in 2021 as demand starts to recover. Inflation expectations are forecast to remain below inflation targets and below historical inflation outcomes in many countries, signaling continued deficient demand.

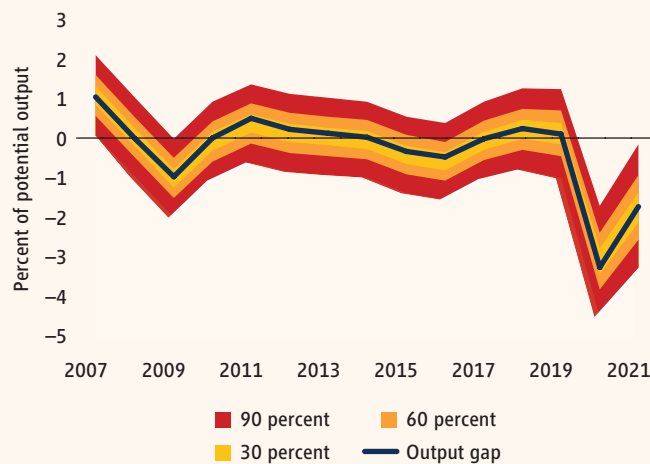
China and Vietnam witnessed the smallest output gaps in 2020, estimated at 3.0 percent and 1.7 percent of potential output, respectively (Figure II.B.3.1). In both countries the output gap is expected to shrink in 2021. Indonesia's output gap is estimated at 4.0 percent of potential growth in 2020 and is expected to remain significant in 2021. Large pandemic-induced demand shocks in Malaysia, Thailand, and the Philippines translated into large output gaps, at closer to and over 5.0 percent for 2020. All three countries are expected to see considerable output gaps in 2021.

(continued)

¹⁴ To determine whether an economy is in a state of excess or deficient demand, this box uses a macroeconomic model which relates the output gap to movements in inflation from its target, to the behavior of the central bank, and to the unemployment rate, capacity utilization, commodity prices, house prices, and private sector credit extension from underlying trends (World Bank 2018).

(Box II.B.3. continued)

Figure II.B.B3.1. Output gap, EAP



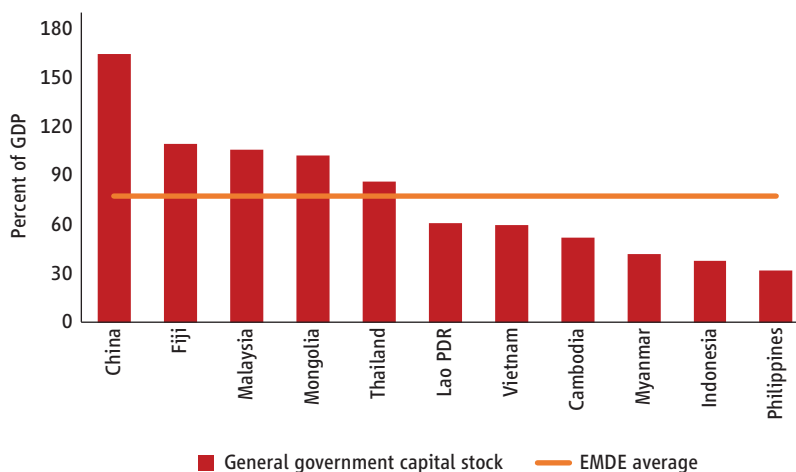
Sources: Haver Analytics; World Bank (2018).

Note: The output gap and inflation forecasts are based on estimates from a modified multivariate filter model of World Bank (2018). Data available to 2020-Q4. Ranges reflect 90 percent confidence bands. Weighted average based on 2019 GDP at 2010 prices and exchange rates.

Growth

Several of the region’s economies could increase public investment, which would help close existing infrastructure gaps. Public capital stock as a percent of GDP is lower than the emerging markets and developing economies (EMDEs) average in more than half of the countries in the region, including in the Philippines, Indonesia, Myanmar, Cambodia, Vietnam, and Lao PDR (Figure II.B.5). Increased public investment in economies with relatively low levels of public capital stock is more likely to crowd in private investment and translate into higher growth compared to economies with high levels of public capital stock (Izquierdo et al. 2019; International Monetary Fund 2020b; Box II.B.4).

Figure II.B.5. Public capital stock is lower than the emerging markets and developing economies (EMDE) average in more than half of the region’s economies

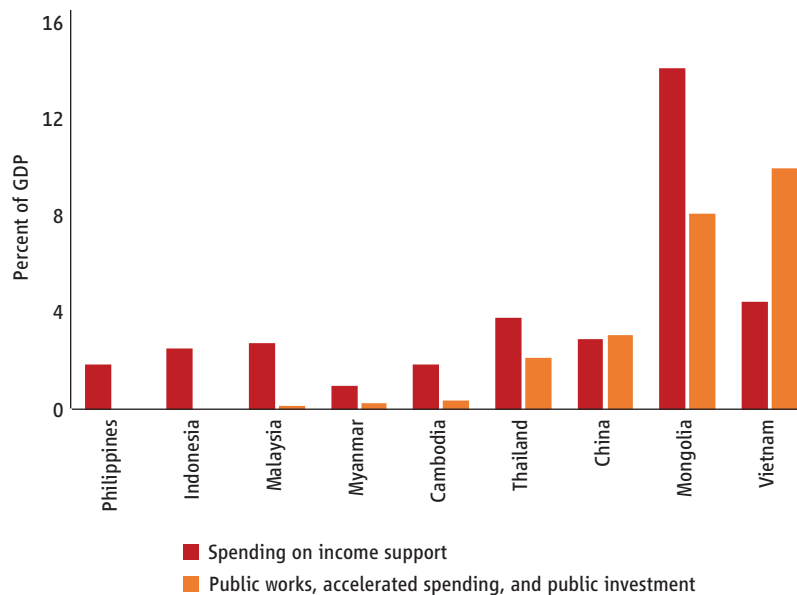


Source: International Monetary Fund Investment and Capital Stock Dataset, 2019.

Note: EMDE refers to emerging markets and developing economies.

Relatively few countries, including China and Vietnam, increased public investment through public works and acceleration of already approved public investment projects (Figure II.B.6). The emphasis in spending remained on income support.

Figure II.B.6. Only a few of the economies supported recovery through public investment



Source: World Bank staff economists.

Note: "Spending on income support" includes support in the form of direct transfers and revenue measures to both households and firms. Data are for year 2020.

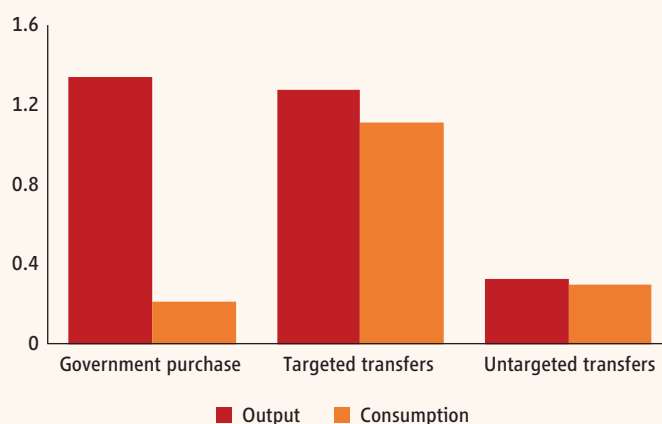
Box II.B.4. Multiplier effects of fiscal policy instruments

During the recovery phase, government relief provided to households and firms could boost output and consumption. A \$1 increase in government purchases or targeted transfers will lead to about a \$1.4 increase in output cumulatively over two years (Figure II.B.4.1).¹⁵ An increase in targeted transfers is more effective in raising the consumption of distressed groups.

During the recovery phase too government purchases and targeted transfers can help. But their effectiveness will depend on the economic environment. Multipliers are likely to be smaller if renewed infections lead to restrictions in mobility or if persistent precautionary behavior limits spending (Auerbach, Gorodnichenko, and Murphy 2020).

(continued)

¹⁵ Note that the multipliers simulated in the analysis may not be directly applicable to country-specific stimulus measures because they may differ in size, design, and macroeconomic conditions from those assumed in the model and policy specifications. The model is calibrated to a hypothetical economy, and the public-debt-to-GDP ratio before the recession is calibrated to be 83 percent of GDP, which is the weighted average of the world economy in 2019. The policy scenarios inject a stimulus measure, one at a time, to the baseline scenario. As monetary policy is at the effective lower bound, an increase in government purchases does not have the typical crowding-out effect on private investment and hence the output multipliers can be significantly above 1.

*(Box II.B.4. continued)***Figure II.B.B4.1. Targeted transfers are more effective in increasing both consumption and output**

Source: Fiscal Monitor, October 2020.

Note: Consumption refers to the consumption of liquidity constrained households. Cumulative 2-year multiplier derived from model-based simulations. The multipliers are calculated based on the response differences between the baseline scenario (a severe recession without additional fiscal stimulus) and a policy scenario (a recession with one of the fiscal stimulus measures). The model features two types of households: those that are liquidity-constrained and consume all the disposable income each period, representing the poorer income group; and the higher-income group, which is comprised of asset holders who have both labor and capital income.

In some countries, high levels of public debt are likely to offset the expansionary effects of fiscal stimulus, because of expectations of fiscal consolidation or rising sovereign risk premia (Ilzetki, Mendoza, and Végh 2013; Huidrom et al. 2020). But low inflationary pressure and a generally low interest rate environment is likely to result in higher fiscal multipliers than in normal times, because the demand stimulus does not drive up the real interest rate. Multipliers tend to be larger in countries less open to trade (as low propensity to import reduces leakage of the demand gains to other countries), in recessions (because resources are idle), and in countries with fixed exchange rate regimes (because exchange rates do not appreciate) (Ilzetki, Mendoza, and Végh 2013; Chodorow-Reich 2019).

As countries move beyond the recovery phase and plan longer term growth, public investment can be scaled up. But again, country circumstances matter. The fiscal multiplier is estimated to be four times smaller for countries with low quality of public investment management (Abiad, Furceri, and Topalova 2016). In countries where corporations have incurred losses or accumulated high levels of debt, weak balance sheets may inhibit an increase in investment, thus muting the crowding in of private investment (Huang et al. 2020).

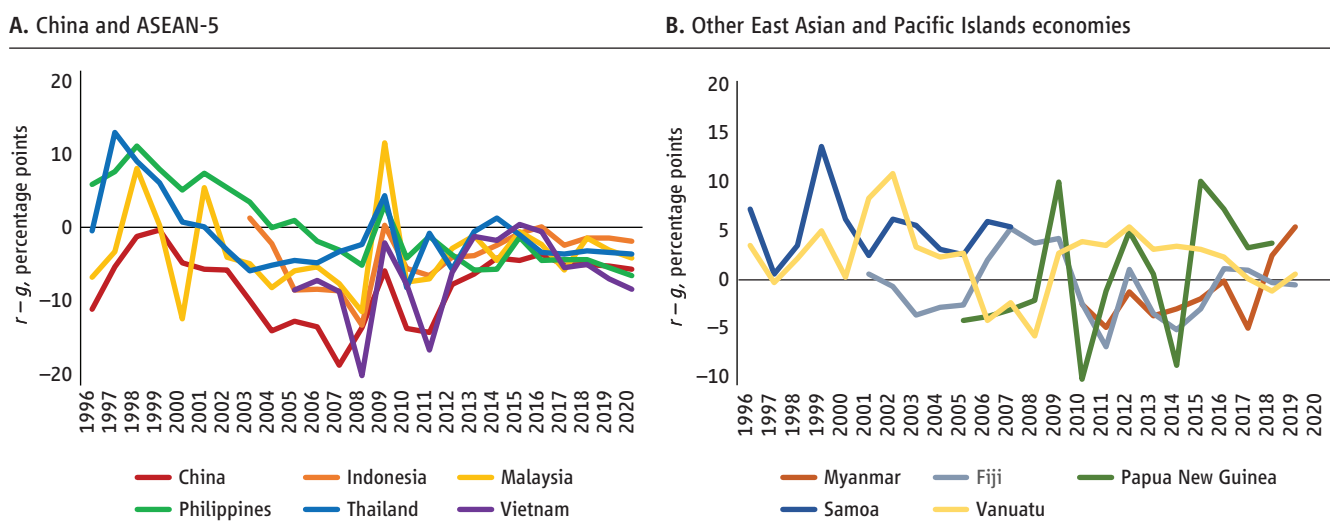
In the EAP economies, the short-term public investment multiplier has been estimated to be about 0.5 on average. An unanticipated positive shock to public investment of 1 percent of GDP increases the level of output by 0.5 percent in the first year. But this masks a high degree of heterogeneity across countries and the multiplier is closer to 1 in countries with low levels of public capital stock, such as Vietnam, Cambodia, Myanmar, Indonesia, and the Philippines.

How Much Can Governments Spend without Incurring Unsustainable Debt?

The need to expand support and favorable terms of borrowing have favored a “whatever it takes” approach to fiscal policy in industrial countries. It is possible that the stimulus will pay for itself by leading to higher aggregate incomes and hence government revenues. And debt would be sustainable if the rates at which governments borrow are lower than the growth rates generated by additional investment (Kose, Ohnsorge, and Sugawara, 2020; Zanna et al. 2019; Easterly, 2002). Under these conditions, governments can keep debt steady, relative to the size of the economy, even if they consistently overspend, as long as their budget deficits are not too large (See Box II.B.5).

How far can countries in the EAP region follow the industrial country example? Interest rates have generally been below nominal growth rates in the EAP region economies: $r - g$ has been consistently negative in the 2000s (except during the GFC) (Figure II.B.7). But there’s heterogeneity across countries. While interest rates have been below nominal growth rates in China and the ASEAN-5 countries, $r - g$ appears to have been mostly positive for other smaller East Asian and Pacific islands economies for which data are available.

Figure II.B.7. Interest rates have mostly been lower than the nominal growth rates in China and ASEAN-5, but not in the smaller economies of the region



Sources: Bloomberg; Haver Analytics; International Financial Statistics; World Bank.
Note: Panels A and B plot country-specific values of $r - g$ for EAP countries with available data.

Box II.B.5. The fiscal arithmetic of debt sustainability: How relevant is it for emerging markets and developing economies?

To understand the conditions for debt sustainability, the traditional accounting identity decomposes the changes in the government debt-to-GDP ratio into:¹⁶

$$d_t - d_{t-1} = \left(\frac{r_t}{1 + g_t} \right) d_{t-1} - \left(\frac{g_t}{1 + g_t} \right) d_{t-1} - P_t \quad (1)$$

where d is the debt-to-GDP ratio, r is the real interest rate, g is the real growth rate, p is the primary surplus (the fiscal surplus excluding interest payments on the government's debt).¹⁷ The first term on the right-hand side reflects the interest cost of financing the debt; the second term reflects the erosion of the debt ratio that stems from the growth of output (the denominator in the debt ratio). The difference between the interest rate and the rate of economic growth is a key determinant of changes in the debt-to-GDP ratio.

To avoid debt explosion:

$$d_t = d_{t-1} \rightarrow \left(\frac{r_t - g_t}{1 + g_t} \right) d_{t-1} = P_t \quad (2)$$

meaning, the primary surplus must be sufficient to pay for debt service.

Equation (2) suggests that when $r_t > g_t$, as was conventionally the case in industrial countries, a country must run a primary surplus to keep the debt-to-GDP ratio stable. However, if $r_t < g_t$, as is the case at present, then a country can run a primary deficit without running the risk of debt instability. The latter situation is expected to persist, based on the expectation that interest rates and inflation will remain low due to a global savings glut and high demand for safe assets.

Furthermore, when the nominal rate of interest is close to zero and has reached an "effective lower bound," conventional monetary policy interventions cannot be used to generate aggregate demand equal to potential output, and therefore fiscal policy is necessary to prop up demand. These conditions are believed to be prevailing in advanced economies (International Monetary Fund 2020b).

While $r_t < g_t$, might be unusual in industrial countries, the satisfaction of this condition has been more the norm for many emerging markets and developing economies (EMDEs) over the past three decades. The reason has been high rates of growth and favorable terms of borrowing ensured by improved macroeconomic management. Nevertheless, the fulfilment of this condition was not seen as a license for unlimited borrowing because the analysis above may overstate the fiscal space a country has.

(continued)

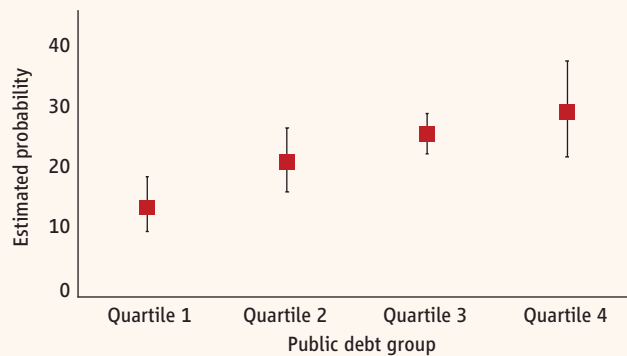
¹⁶ See Mauro and Zilinsky (2016) and Blanchard (2021) for an exposition of this issue.

¹⁷ The equation also can include the "stock-flow" residual which captures factors such as valuation effects due to changes in the exchange rate, privatizations and sales of other public assets, debt bailouts of entities that are not part of the general government (banks, state-owned enterprises), and central bank deficit financing, such as purchases of government debt (seigniorage).

(Box II.B.5. continued)

First, $r_t - g_t$ is not stable and subject to reversals when either growth plummets or rates of interest spike. The interest rates–growth rates differential has been subject to reversals (from negative to positive), usually following economic shocks or financial market volatility. These reversals may occur in both emerging markets (Mauro and Zhou 2021) as well as in advanced economies (Mehrotra and Sergeyev 2020), and are more likely when public debt is high (Figure II.B.B5.1). In the presence of high debt ratios, a rise in interest rates causes the government’s total borrowing costs—and thus the deficit—to increase substantially. Indeed, the increase in interest rates at the onset of the pandemic was higher for countries with higher public debt (Presbitero and Wiriadinata 2020).

Figure II.B.B5.1. $r - g$ reversal are more likely when public debt is high



Source: World Bank staff estimates.

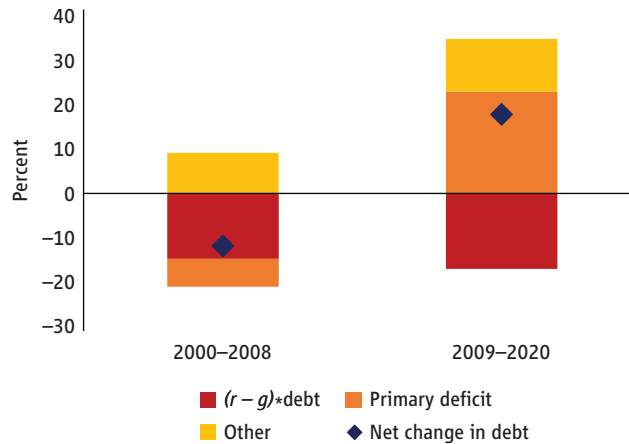
Note: The chart plots the estimated probabilities (and the associated 90 percent confidence intervals) that the average $r-g$ over five years ($r-g_{t+5}$) is positive, given at least two consecutive years of negative $r-g$ (in year $t-1$ and t), as a function of the current public debt-to-GDP ratio. The probabilities are estimated using a logit model and regressing an indicator of positive future $r-g_{t+5}$ on an indicator of negative current $r-g_t$, indicators of debt groups based on the quartiles of the public debt-to-GDP distribution, and their interaction terms. $r-g_t$ denotes annual $r-g$ in year t and $r-g_{t+5}$ denotes annualized 5-year average $r-g$ from year $t+1$ to $t+5$. Red squares denote point estimates and bars show 90 percent confidence intervals.

In EMDEs, interest rates are sensitive to fiscal deficits and risk premia on interest rates can increase suddenly if concerns about debt sustainability arise (Subramanian and Felman 2021). Markets tend to be less forgiving of EMDEs than advanced countries, especially if there are other vulnerabilities like foreign currency debt, overvalued exchange rates, financial system fragilities and commodity dependence (Gnimassoun and Do Santos 2021; Kose, Ohnsorge, and Sugawara 2020). Higher debt also means even higher debt service payments and since increasing revenues is a challenge in EMDEs, other expenditures can be crowded out affecting growth and risking a political backlash. Furthermore, opaque contingent liabilities can understate true debt. Finally, interest rates in many EMDEs are significantly higher than zero and there is room for monetary policy to prop up demand.

The situation is likely to be even more difficult post-COVID-19. Countries have higher stocks of debt and much higher risk of being burdened by contingent liabilities amid deteriorating bank and corporate balance sheets. Moreover, growth rates are likely to be lower due to economic scarring and primary balances worse due to shrinking revenue. Expansionary fiscal policy in industrial countries is already leading to an increase in long-term interest rates which will put pressure also on developing countries.

Despite the favorable fiscal arithmetic in many countries, debt in the EAP economies has been increasing since the Global Financial Crisis, fueled by an increase in the primary deficit (Figure II.B.8).

Figure II.B.8. The primary deficit has been the primary driver of the increase in debt-to-GDP ratio since the global financial crisis

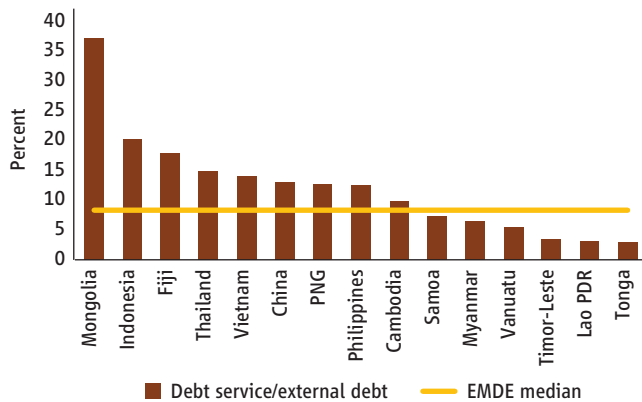


Sources: Bloomberg; Haver Analytics; International Financial Statistics; World Bank.
Note: Weighted averages.

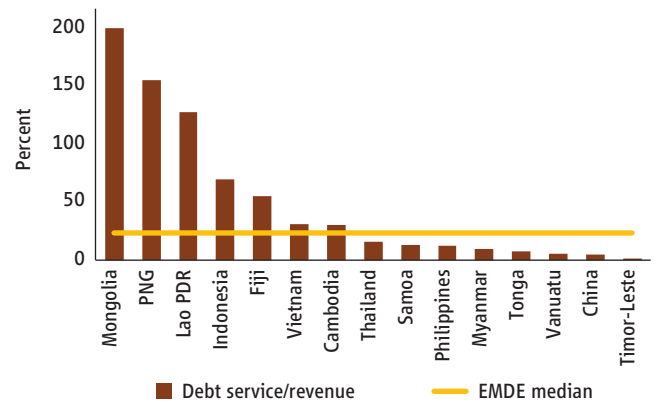
In addition, differently from advanced economies where interest rates are near zero, new debt is not costless in developing countries. Interest rates are lower than in the past, but currently still higher than before COVID-19. Rising debt service could become a constraint, risking crowding out other government spending (Figure II.B.9).

Figure II.B.9. Debt service is relatively high in several economies in the EAP region

A. Debt service to external debt, EAP



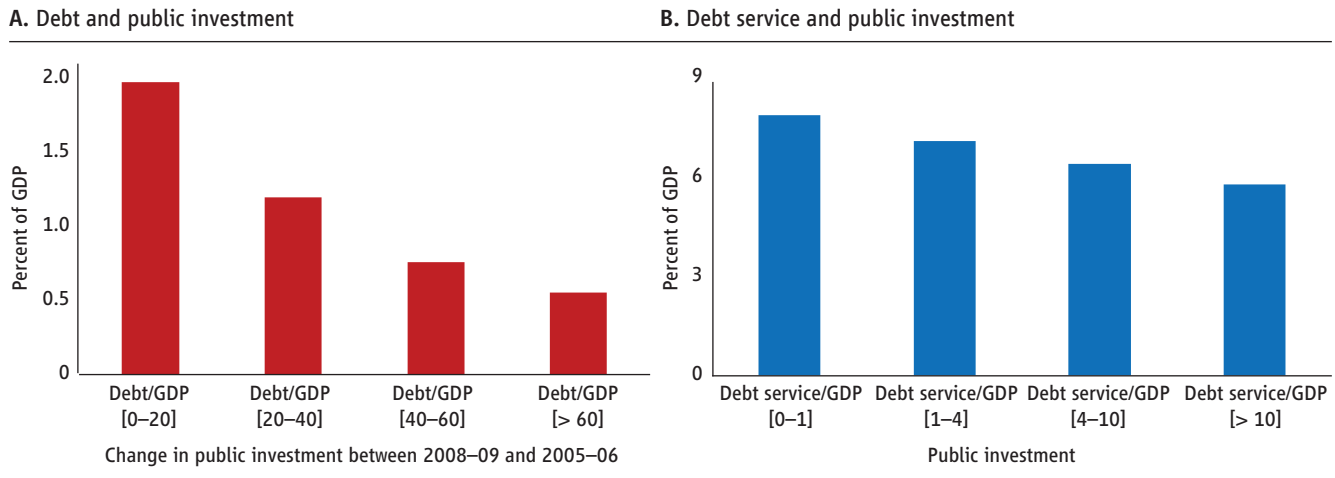
B. Debt service to revenues



Source: International Debt Statistics, World Bank.

High public debt and debt service could also crowd out public investment (Figure II.B.10).

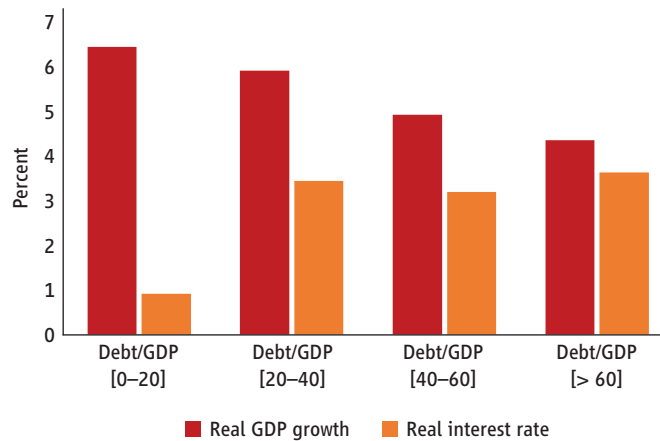
Figure II.B.10. High debt and high debt service crowd out public investment



Source: IMF World Economic Outlook.
Note: A. The chart plots the average change in public investment over GDP between 2008–09 and 2005–06 against the public debt-to-GDP in 2007 for 99 developing countries (of which 9 EAP countries). B. The chart plots the average public investment over GDP for different levels of the contemporaneous debt service over GDP ratio. The sample includes 101 emerging and developing countries (of which 9 EAP countries) with at least 15 observations over the period 1990–2019.

The COVID-19 crisis has lowered potential growth projections across the region (Part I). High and growing public debt could weigh on growth through higher interest rates and negative effects on investment (Figure II.B.11).

Figure II.B.11. Higher government debt has corresponded to lower economic growth and higher interest rates



Sources: World Development indicators; World Bank staff calculations.
Note: The chart plots the average real GDP growth and real long-term interest rates for different levels of the public debt-to-GDP ratio (x-axis). The sample includes 50 developing (of which 10 EAP) countries with at least 10 observations on $r-g$ and public debt over GDP over the period 2000–2019.

UNEVEN RECOVERY

As larger deficits are financed, the debt also swells in subsequent years. Worried investors are likely to demand even higher interest rates before purchasing new debt, raising interest rates and debt even further, and potentially ending up in crisis and default (Kose et al. 2020; Reinhart and Rogoff 2009). Low capacity to generate revenue and other country-specific vulnerabilities in some EAP countries could also cause unease to investors (Table II.B.1).

Table II.B.1. Pockets of vulnerability may exacerbate shocks in parts of the region

	2021–25	2020	2021–25	2021–25	2021–25	2021–25	2020	2020
	GDP growth	r – g	General government revenue (% of GDP)	Current account (% of GDP)	Fiscal balance (% of GDP)	General government gross debt (% of GDP)	External financing needs (% of total reserves) (% of GDP)	Domestic credit to private sector (% of GDP)
China	6.2	-5.8	25.0	0.6	-10.0	73.4	-0.8	201.8
Malaysia	6.0	-4.4	19.3	1.4	-3.6	64.0	85.9	130.8
Indonesia	5.3	-2.0	12.7	-2.1	-3.5	42.9	75.8	38.2
Philippines	6.7	-6.7	17.8	-2.0	-6.4	56.4	1.5	56.8
Vietnam	7.0	-8.5	18.3	0.6	-4.2	46.6	15.4	130.7
Thailand	4.1	-3.7	21.0	4.3	-2.5	56.6	-1.9	120.2
Lao PDR	5.6		15.1	-7.4	-4.5	69.5	318.7	
Mongolia	5.2		30.2	-7.5	-3.7		194.7	49.6
Cambodia	7.1		20.9	-11.8	-3.6	33.8	39.4	114.2
Myanmar	6.2	5.5	15.8	-4.2	-5.2	48.2	45.4	25.7
Timor-Leste	3.3		49.0	-37.2	-44.2	19.5	41.8	13.1
Fiji	5.4	-0.5	21.6	6.4	-5.3	78.2	84.1	100.7
The Solomon Islands	3.6		32.0	-12.2	-4.2	23.5	37.8	
Papua New Guinea	2.6		15.8	17.3	-4.2	47.6	69.3	18.0
Samoa	1.5		31.0	-3.1	-5.8	71.2	32.5	89.2
Vanuatu	3.5	0.6	30.9	-2.9	-4.7	54.1	3.9	58.3
Tonga	1.5		38.9	-11.9	-3.8	45.2		37.7
Kiribati	2.1		99.9	8.0	-0.3	37.1		
The Marshall Islands	1.7		72.1	0.8	-2.0	27.0		
The Federal States of Micronesia	0.7		61.6	1.2	0.7	15.2		
Nauru	0.8		121.1	1.1	5.1	62.3		
Palau	3.7		40.1	-31.3	-3.0			
Tuvalu	3.1		95.0	-10.1	-6.7	4.6		

Sources: Bloomberg; Haver Analytics; Institute of International Finance; World Economic Outlook; World Bank staff calculations.
Note: For Mongolia, external debt includes some private sector borrowing classified officially as foreign direct investment.

Table II.B.2 presents a summary of the fiscal stance and an assessment of their fiscal space, drawing on the attributes drawn together in Table II.B.1. Countries are presented in decreasing order of fiscal space. China has provided a significant if somewhat unbalanced stimulus drawing upon its adequate fiscal space but runs the risk of exacerbating the problem of local and state-owned enterprise debt. At the other extreme, are the PICs which have limited fiscal space and have struggled to provide the support that their people and economies need.

Table II.B.2. Fiscal stance and space in EAP

<i>Country</i>	<i>Fiscal stance</i>	<i>Assessment</i>
China	Significant stimulus but emphasis on production.	Adequate fiscal space but high private, local government and SOE debt.
Philippines	Conservative stance and under-spending due to weak implementation.	Adequate fiscal space but supply problems due to COVID and natural disasters.
Thailand	High support. Risk early unwinding due to conservative stance, complex rules.	Adequate fiscal space but large private debt. Political instability creates growth risks.
Cambodia	Significant support. Less than planned in 2020, but more spending in 2021.	Adequate fiscal space but high private debt and large current account deficit.
Vietnam	Increased spending, mainly via accelerated public investment.	Reasonable fiscal space but high private debt a source of concern.
Indonesia	Significant stimulus but limited by credit rating concerns.	Low revenue and large external financing needs limit fiscal space.
Malaysia	Changed fiscal rules. Generous relief package. Rating agency downgrade.	High public debt, low revenues, and high financing needs limit fiscal space.
Myanmar	Small increase in spending. Increased concessional financing, e.g., DSSI.	Some fiscal space but costly borrowing. Political instability threatens growth.
Timor-Leste	Significant increase in spending, mostly on household support.	Adequate fiscal space owing to Petroleum Fund, but implementation challenges.
Lao PDR	Limited additional support.	Large government debt. Non-concessional borrowing. Fiscally constrained.
Mongolia	Substantial support.	High external debt and commodity dependence limit fiscal space.
PNG	Small fiscal expansion.	High fiscal deficits, government debt, external private debt. Political instability.
PICs	Limited spending relative to needs. Inadequate social protection.	Fiscal constraints. Debt distress. Low growth.

Source: World Bank staff.

Reconciling Current Fiscal Needs with Future Stability

In Section 2 above we saw the multiple roles fiscal policy is expected to play in this crisis. Section 3 demonstrated the constraints that countries face on borrowing and spending. Countries, therefore, face sharp trade-offs as they balance the continued need for economic support against the risk of future instability. There are at least three routes to softening the trade-offs: credibly committing to future fiscal reform; using monetary policy to share the burden of economic support; international coordination of fiscal policy to magnify its collective impact.

Committing to fiscal reform

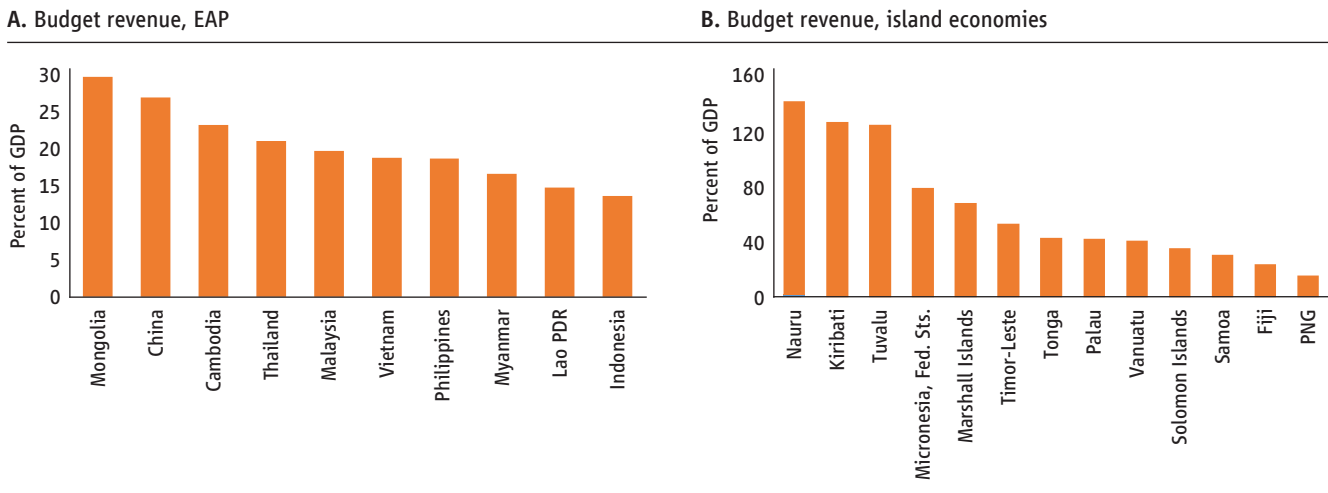
One solution to this conundrum is not to curtail support prematurely but to credibly commit to future discipline. Accordingly, many have started drawing fiscal consolidation plans, which involve eventually lowering spending and/or increasing revenues, including through the re-introduction of a fiscal rule. These plans would ideally also include measures to increase the efficiency of both expenditure and revenue generation. While raising revenue and cutting spending during a crisis is difficult, committing to future reforms may be politically easier—because opposition from vested interests is likely to be weaker when they are currently benefitting from government support and bailouts.

We illustrate options by drawing on the experience of Indonesia, Malaysia and the Philippines. Each of these countries have previously relied on explicit or implicit rules to curb their fiscal spending. In response to the COVID-19 shock, they all temporarily relaxed their fiscal rules to create space to give tax relief and increase spending on health, social assistance and industrial support. Indonesia suspended its fiscal rule limiting the fiscal deficit to less than 3 percent of GDP. Its stated intention is to return to a 3 percent deficit by 2023. Malaysia temporarily increased its legal domestic debt limit from 55 to 60 percent of GDP as well as its foreign borrowing limit but still needs to specify how long the relaxation will last. The Philippines does not have an explicit fiscal rule but its implicit fiscal deficit target is not to exceed the ASEAN average—to preserve its good credit ratings. The Development Budget Coordination Committee sets fiscal targets over the medium term, based on estimates of revenues, which anchor the country's medium-term budget and deficit targets. As COVID-19 hit, the fiscal deficit target for 2020 was revised from 3.2 to 7.6 percent of GDP. It has not yet announced future consolidation plans.

Looking ahead, there may be some early, low-hanging opportunities in each country. Each could create fiscal space by undertaking energy subsidy reforms, increasing and simplifying tobacco and alcohol excise tariffs, and introducing a sugar-sweetened beverage excise. A single-use plastics excise and a fuel excise will have environmental benefits. While some emergency social programs could be phased out, others could remain in place to strengthen the social safety net. Replacing subsidies by targeted social spending would make fiscal policy more progressive.

More, far reaching reforms could also be instituted (Figure II.B.12). On the revenue side it will be important to increase the progressivity of the tax framework, through reforms to, among others, personal income tax, consumption tax, corporate taxes and capital gains taxes, as well as enhancing revenue administration. On the expenditure side it will be important to contain the rising costs of public wage bill and pensions, improving the targeting of social spending, phasing out generalized subsidies, and strengthening public investment project selection and management.

Figure II.B.12. Some EAP countries exhibit low revenue generating capacity

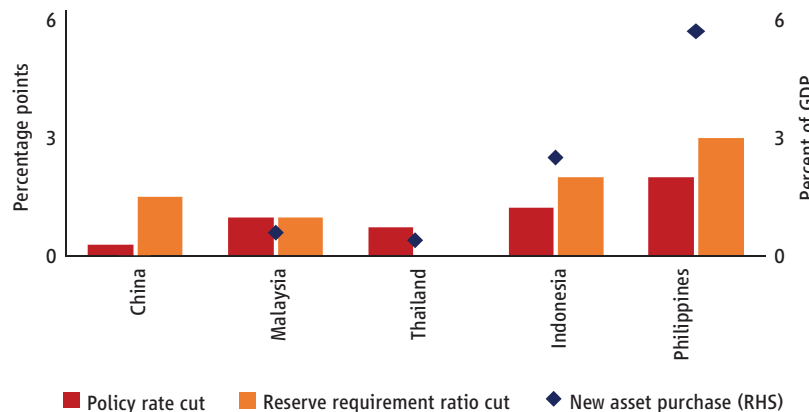


Source: IMF; World Bank.
Notes: Estimated data for 2020 and projected for 2021.

Coordinating fiscal and monetary policy

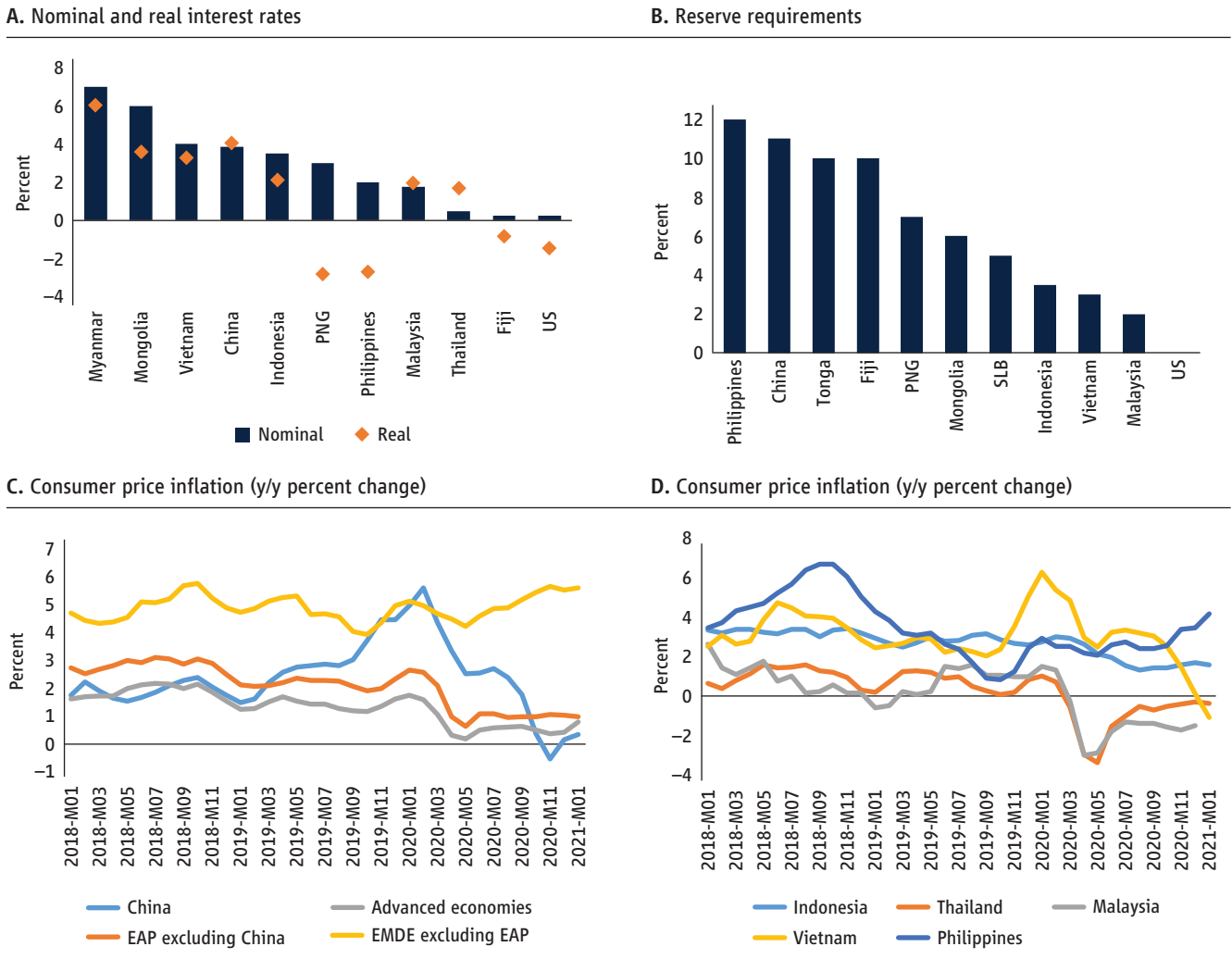
Fiscal policy has played a relatively important role in macroeconomic stabilization during the COVID-19 crisis, but EAP countries have also relied on monetary policy actions (Figure II.B.13). Key components were cuts in policy rates, reserve requirement ratios and in some countries new asset purchases. In parallel, authorities exercised regulatory forbearance—delayed NPL counting and provisioning, debt servicing holidays, and delayed capital and other Basel III requirements. There is, nevertheless, still room for propping up demand through monetary policy. EAP countries’ interest rates are positive, reserves requirements relatively high, and inflation subdued (Figure II.B.14). Furthermore, coordination between fiscal and monetary policy would ensure that the latter complements the former and shares the burden of supporting economic recovery.

Figure II.B.13. Monetary policy supported recovery across the region



Sources: Haver Analytics; International Monetary Fund.
Note: Red bars denote cumulative policy rate cuts since the outbreak. Orange bars denote cumulative cuts in reserve requirement ratio. Blue diamonds denote recently announced central bank asset purchases expressed relative to respective 2019 nominal GDPs. Last observation is February 2021.

Figure II.B.14. Policy rates remain above zero in EAP while reserve requirements are high in some countries and inflation low



Source: Haver Analytics.
 Note: Myanmar: Central Bank Rate (end of period [EOP], percent), Mongolia: Policy Rate (EOP, percent per annum), China: Prime Lending Rate (EOP, percent per annum), Indonesia: 7 Day Reverse Repo Rate (EOP, percent), Papua New Guinea: Kina Facility Rate [KFR] (EOP, percent per annum), Vietnam: Discount Rate (percent, EOP) Philippines: Reverse Repo Rate: Overnight [Borrowing] (EOP, percent per annum), Malaysia: Overnight Policy Rate (EOP, percent), Thailand: One-Day Repurchase Rate (percent, EOP), U.S.: Federal Funds [effective] Rate.
 The ratio is calculated as a proportion of customer deposits and determines how much commercial banks must set aside rather than lend out. Deposits at commercial banks can take many forms, either as time deposits or sight deposits, and can be in local currency or foreign currency. Central banks often have different ratios for different types of deposits.

International coordination of fiscal policy

Global and regional coordination of fiscal policy could boost its impact. In open economies, we see leakages of fiscal stimulus because part of governments’ added spending could be used to purchase imported goods rather than support domestic production. Because of these externalities, governments tend to under-provide stimulus relative to the global optimum. A further risk can arise from asymmetric incentives: countries with large export sectors may hold back on fiscal support while increased support is provided by other large open economies.

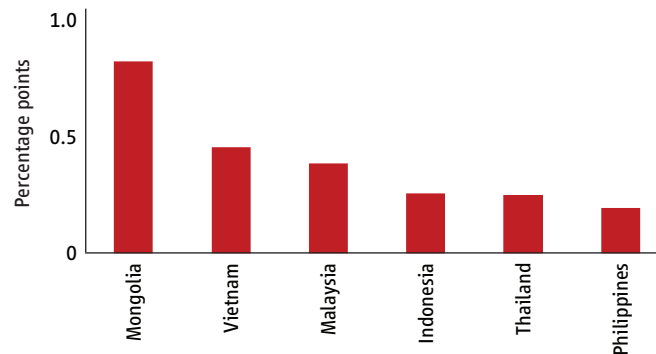
In these circumstances, the resulting imbalances could generate protectionist pressures. Specifically, the stimulus providing government may impose import restrictions to maximize the domestic impact of their support measures. If these measures trigger a similar response from other countries, the result would be higher costs of production and loss in global welfare.

Coordinated fiscal actions can therefore encourage governments to provide adequate fiscal support and to refrain from trade intervention (OECD 2020). Specifically, China, the largest economy in the EAP region, which has ample fiscal space and a current account surplus, could do more to boost consumption. The resulting increase in external demand for other countries will support their production and incomes, which in turn will boost demand for imported goods some of which are produced in China, generating a virtuous recovery cycle (Figure II.B.15).

Of course, the composition and quality of fiscal support by China would be shaped by its own objectives. Traditional infrastructural investment by local government risks exacerbating China's existing fiscal problems, such as the increased liabilities of local governments and state-owned enterprises. Increased social spending and green investment would not only bolster short-term demand but contribute to the intended medium-term rebalancing toward more inclusive and sustainable growth.

Figure II.B.15. An increase in growth in China would boost growth in the region's other economies

(percentage points)



Sources: World Bank; Haver Analytics; J.P. Morgan; IMF Balance of Payments Statistics (BOP); IMF Direction of Trade Statistics (DOTS); UNCTAD.

Note: Impact of a 1 percentage-point increase in the Chinese GDP growth rate. Median of posterior distribution. Estimates based on a Bayesian SVAR, estimated using quarterly data for Q1 1998–Q1 2018. Estimates for each country include the following variables: growth in G7 excluding Japan; the JPMorgan Emerging Market Bond Index; growth in Japan, China, and Republic of Korea; commodity price growth; recipient-country growth; and the real exchange rate of the recipient country. Commodity exports are weighed by each commodity's average export share in the commodity export basket of the spillover destination country. A lag of four quarters is adopted. Identification is based on a recursive structure, with variables ordered as listed above, and earlier variables are assumed to be contemporaneously unaffected by later variables. Inferences are based on 2,000 Monte Carlo draws. Developing EAP economies include Indonesia, Malaysia, the Philippines, and Thailand. Mongolia and Vietnam are excluded due to poor data quality. Estimated spillovers include effects through indirect channels, including confidence and global and regional value chains. Average impact on growth estimated over two years.

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Part II.C. Building back better—toward a low carbon future

Overview

The developing East Asia and Pacific region is at the frontline of combating global climate change. The region is a major contributor to rising greenhouse gas emissions causing climate change—with emissions tripling since the year 2000 and now accounting for nearly one-third of global emissions. The region also faces the consequences of climate change, from typhoons and tropical diseases to melting glaciers and rising oceans. Therefore, early climate action by the region is both in the global and the region’s own interest. In fact, without early and decisive action and policy shifts in this part of the world, it will be difficult to achieve the reduction in global emissions necessary to get on track toward the 2°C temperature goal of the Paris Agreement.

However, decoupling output growth from emissions will require a transformation in consumption and production patterns on a massive scale. The significant up-front costs involved in mitigation and adaptation measures, the potential impact on energy supply reliability and prices, and the dislocation of capital and labor that will result from the inevitable exit of polluting industries pose constraints that will need to be overcome for the region to move on an accelerated path to a low carbon future. These constraints, as well as the current economic distress and the power of vested interests, may explain why “green” measures are outstripped by “brown” activities in the economic stimulus packages across the East Asia and Pacific region. Looking ahead, the trade-offs between greenness and inclusive growth will become less sharp thanks to technological progress, and that is likely to change the political economy of climate action.

Whether climate and economic objectives are incompatible or mutually reinforcing is in part a question of policy choices.

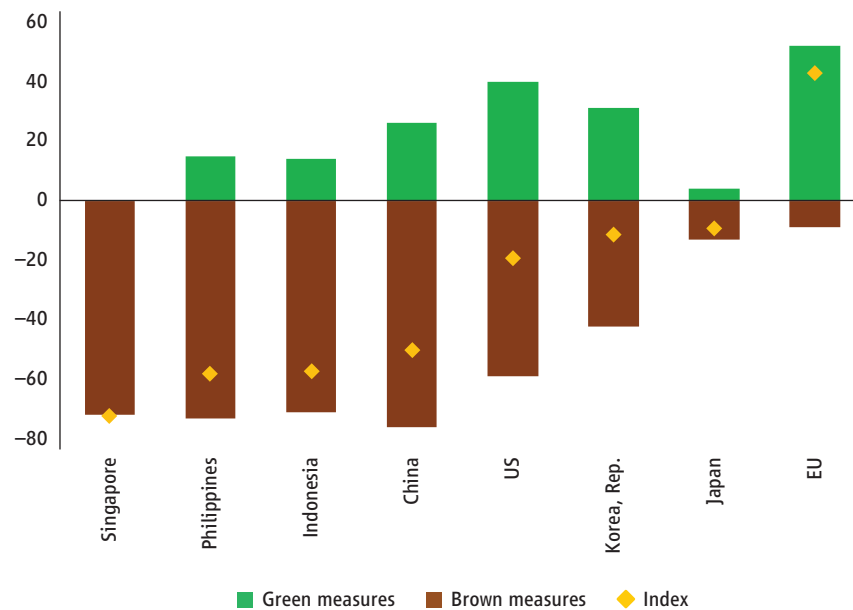
- First, when promoting low carbon and more resilient development, policy makers can rely on a mix of instruments that can drive efficient abatement across the economy. Policy options include: (i) phasing out fossil fuel and energy subsidies, (ii) adjusting carbon prices, (iii) fostering green public investment in low carbon and resilient infrastructure and innovation, and (iv) undertaking low carbon policy reforms in key sectors, such as energy, transport, agriculture, land use, and urban planning.
- Second, policies to engender a low carbon transformation will need to be accompanied by steps to ensure their costs and benefits are distributed fairly, both domestically and internationally. These steps are necessary to ensure broad-based political support and to overcome resistance from vested interests. For instance, recycling revenue generated by carbon pricing back into the economy could help subsidize abatement costs, alleviate negative social impacts, and cut other distortionary taxes on labor, consumption, or profits.
- Third, regional and global cooperation will be important in inducing necessary climate action. Bolder action by China is needed to catalyze cooperation because of the size of its emissions. China must act because global warming threatens its people and it has the economic capacity to adjust. Smaller developing countries will, however, need international assistance to take deeper climate action than is nationally optimal—not least because of the persistent global inequities in per capita emissions. For example, Vietnam’s revised Nationally Determined Commitment (NDC) aims to reduce GHG emissions by 2030 by 9 percent using domestic resources and by 27 percent with international support. Achieving this goal would require at least US\$20 billion more

in investment than business-as-usual. In the past two decades, the World Bank provided about US\$5 billion financing for energy sector development. The additional assistance that is required would be more effective if complemented by a supportive policy framework. Other forms of mutually beneficially collective action, ranging from diffusion of green technologies to cross-border green investment, will also help but are not likely to be adequate substitutes for meaningful assistance.

Emissions and Exposure

The recovery from the COVID-19 pandemic offers an opportunity to accelerate the shift to a low carbon and more resilient future. By exposing the immense human and economic costs associated with interconnected environmental, economic and social vulnerabilities, the pandemic has led to a clarion call to leverage economic recovery efforts to build back better and engender a more sustainable and resilient post-COVID-19 recovery.¹⁸ Despite this renewed sense of urgency, economic stimulus packages across the East Asia and Pacific region have largely fallen short of this ambition with “green” measures being outstripped by “brown” activities (Figure II.C.1). One reason may be that amidst the economic distress, policy makers remain focused on implementing rapid economic relief measures and reluctant to impose any explicit or implicit green taxes. Another reason could be the power of vested interests, for example in the coal industry, which resist changes that would impose large adjustment costs on them.

Figure II.C.1. “Greenness” of economic stimulus measures



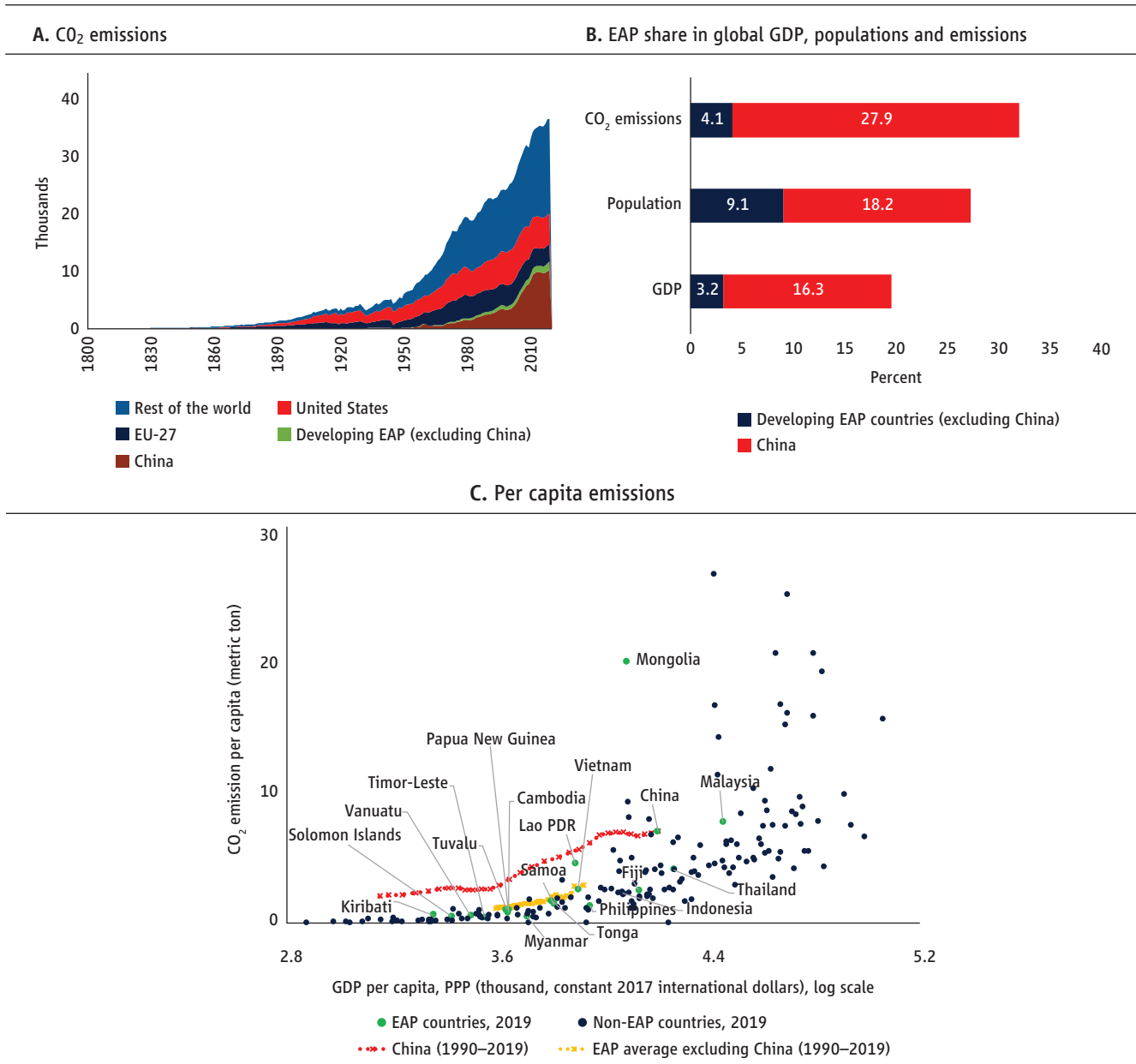
Source: World Bank Staff based on Vivid Economics (no. 2021).

Note: The figure provides a broad indicator of trends; it may not capture all green measures or may include some green measures that have not been implemented. The index considers only five sectors because of their historical impact on climate and environment: agriculture, energy, industry, waste management, and transport. Other sectors, such as health and social policy that feature prominently in policy responses, are not considered. Within the selected five sectors, the index assigns a “greenness factor” to stimulus measures. This greenness factor is constructed by combining (i) an assessment of the specific measures announced in the packages using a rating scheme that grades their greenness/brownness, and (ii) a general environmental performance indicator to reflect the broader sector and country contexts (because the greenness of stimulus measures will be affected by the stringency of existing environmental regulations, and other country-sector-specific factors). The final index for each country is an average of sectoral impact, normalized to a scale of -100 to 100.

¹⁸ Global opinion polls suggest widespread public support with two-thirds of respondents expressing support for green economic recovery measures. IPSOS survey conducted in 29 countries. <https://www.ipsos.com/sites/default/files/ct/news/documents/2020-04/earth-day-2020-ipsos.pdf>.

While emissions in the EAP region are low on a per capita basis relative to industrial countries, they are high in absolute terms and relative to the region’s GDP (Figure II.C.2). Home to 2.1 billion people—about 27 percent of the global population—the region accounts for just under 20 percent of global GDP but 33 percent of global CO₂ emissions, making its mitigation path critical for achieving global emission reduction goals. Furthermore, its greenhouse gas emissions are rising fast (Figure II.C.2). Reflecting rapid economic growth but also carbon-intensive energy systems and land use patterns, carbon emissions from the region have almost tripled since 2000, while emissions in the US and the EU declined by 11.9 and 19.3 percent, respectively, over the same period. The largest emitting sectors vary by country. In China and Vietnam coal-dependent energy systems cause the predominant share of emissions whereas land use and deforestation, agriculture, and transport drive emissions in Indonesia and other parts of the region. Without effective mitigation strategies, emissions are expected to continue to grow due to the combined effects of rapidly rising incomes, urbanization and industrialization which will boost demand for electricity, transportation and food across major parts of the region.

Figure II.C.2. East Asia and the Pacific accounts for one-third of global CO₂ emissions

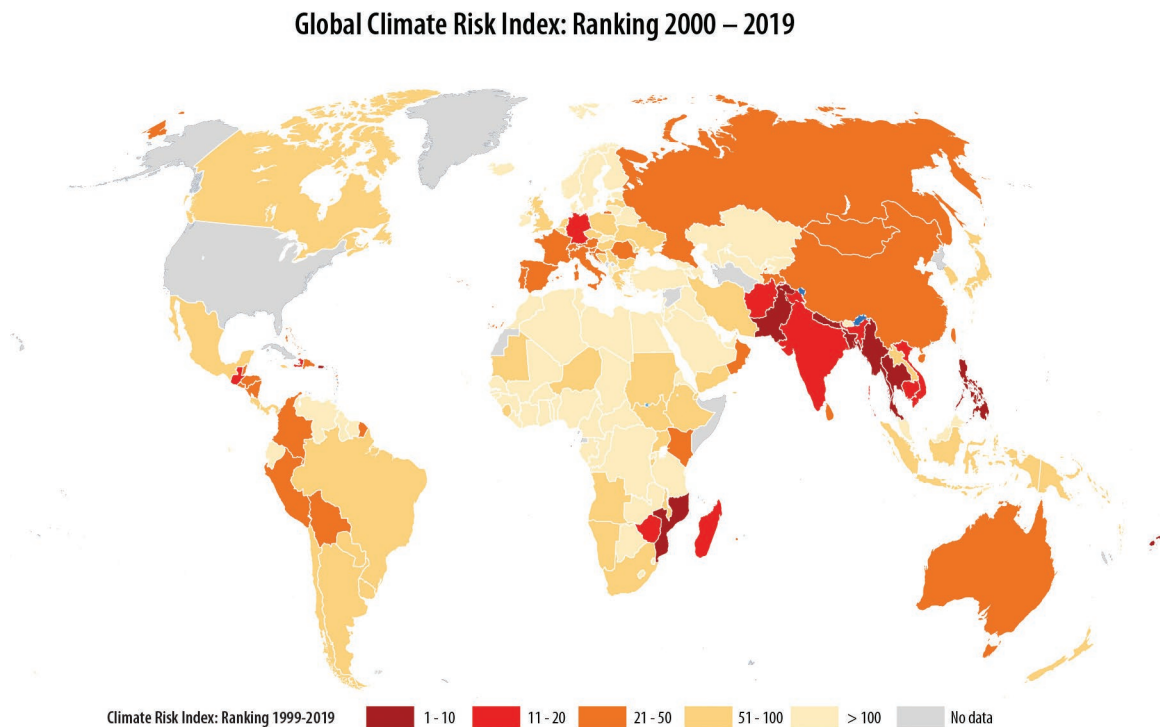


Source: World Bank staff based on Global Carbon Project and WDI.

The region is also among the most vulnerable to climate risks. Climate change will compound existing pressures on natural resources and the environment associated with rapid urbanization, industrialization, and economic development in large parts of developing Asia. Rising temperatures, more frequent and intense natural disasters, poor air quality, increased incidence of tropical diseases, and stresses on water and food systems all pose serious threats to growth and well-being in the region. With its densely populated coastal areas, large parts of the region's population and economic infrastructure are heavily exposed to the impacts of climate change. Moreover, about 27 percent of the region's workforce is employed in agriculture, one of the sectors most vulnerable to climate change with the share being particularly high in the poorest countries. In fact, countries in the region are already being severely impacted by climate-related events. According to the long-term Climate Risk Index which measures the human and economic losses associated with extreme weather events between 2000 and 2019, six out of the twenty most exposed countries in the world are in the East Asia Pacific region (Figure II.C.3). Some countries, like the Philippines during Typhoon Vongfon, had to cope with extreme weather events while tackling COVID-19.

Figure II.C.3. East Asia and the Pacific is heavily exposed to climate risks

Climate risk index ranking (1998–2017)

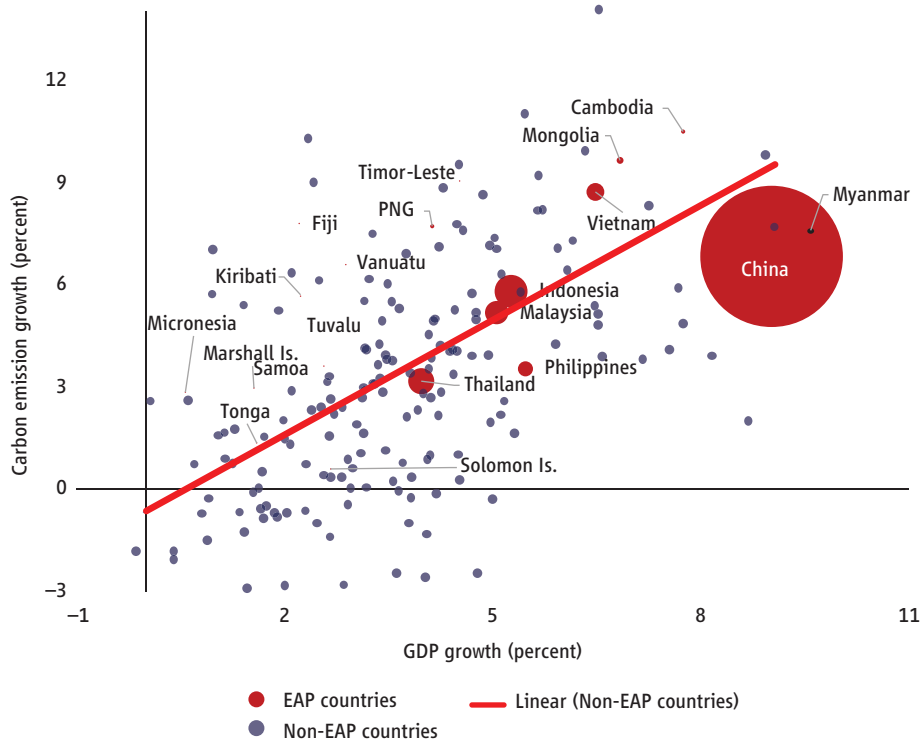


Source: germanwatch.org.

Decarbonization: Challenge, Opportunity, and Imperative

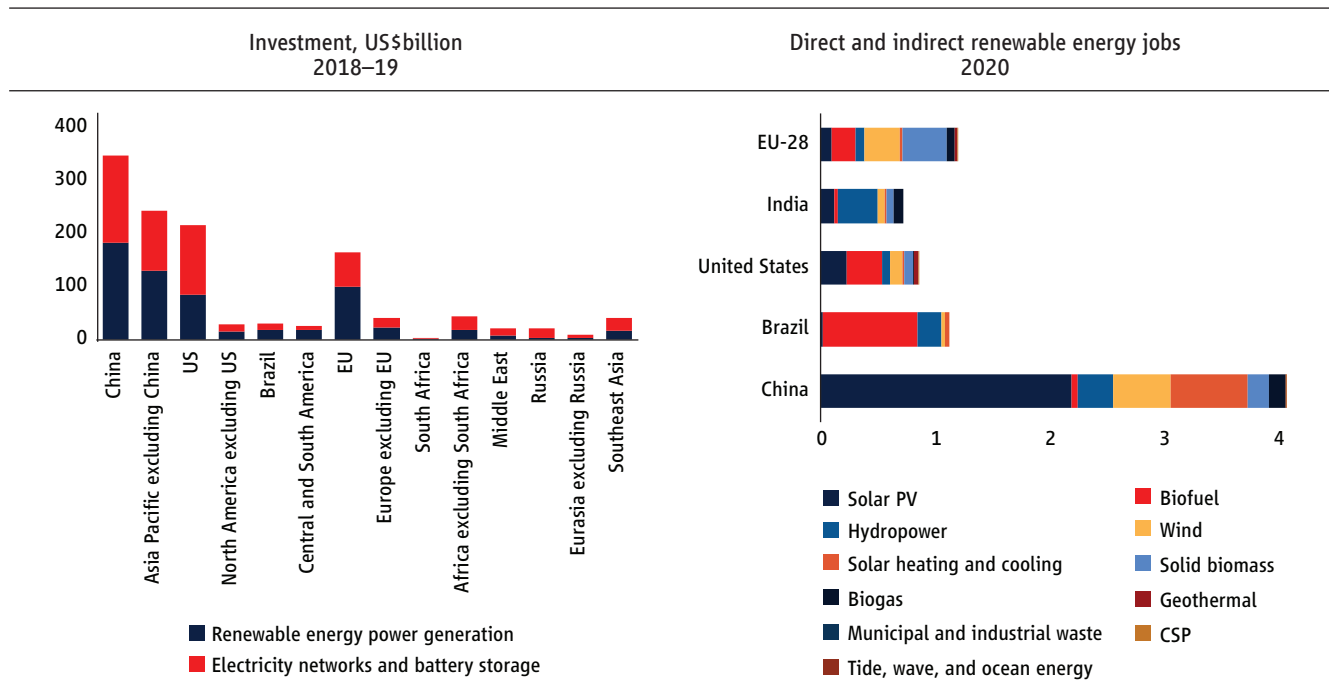
Acting decisively on climate change while simultaneously meeting the region's economic growth ambitions may seem daunting. Historically, there has been a strong link between economic growth and rising emissions across the region. In fact, the growth of CO₂ emissions outpaced rapid economic growth across several economies in the region, implying a rising carbon intensity of GDP (Figure II.C.4).

Figure II.C.4. East Asia’s growth paths has traditionally been carbon-intensive—output vs. emissions growth across countries 2000–2020



Source: World Bank staff based on Carbon Project and WDI.
 Note: Bubble size denotes share in global emissions.

At the same time, thanks to technological progress, developing EAP has immense potential to capture economic opportunities that may arise from a greener and climate smart development path. Like previous economic transformations on the scale and pace envisaged, a decisive move toward decarbonization in the region and the rest of world is likely to unlock new sources of economic growth and job creation as well as growing markets for first movers. Developing EAP is well positioned to benefit from these shifts. Core parts of the region’s urban, transportation and energy systems are still being built out, and the creation of large new capacity creates an opportunity to invest in more resilient, low carbon infrastructure from the outset rather than locking in carbon-dependent technologies and assets. As a global manufacturing hub, the region is also well placed to convert this investment push into long-term competitive advantages in emerging and fast-growing green technologies. Already today the region is, for example, the largest market for investment in green technologies from electric vehicles to renewable energy, and more than half of the world’s direct and indirect jobs in the renewable energy sector are in China (Figure II.C.5). Conversely, if East Asia’s low carbon transition lags the rest of the world, there is a serious risk of declining market access with carbon border adjustments becoming an integral part of trade policy in key export markets, such as the EU and US.

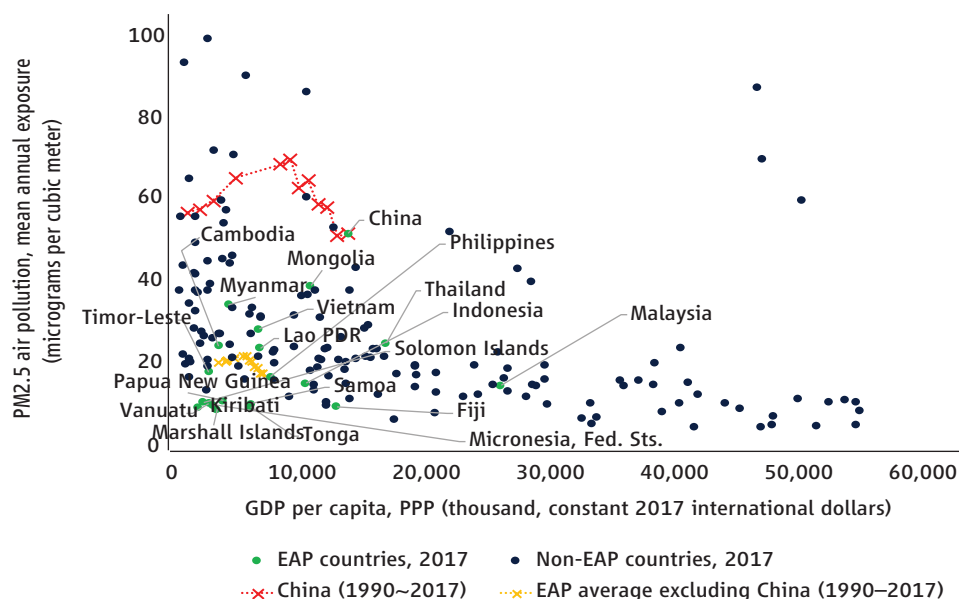
Figure II.C.5. Green investment and job creation as future sources of growth

Source: World Bank staff estimate based on IEA and IRENA.

Climate action will also generate co-benefits in terms of cleaner air and improved public health outcomes. Air pollution poses a serious threat to the well-being of millions of people across developing EAP, especially in its fast urbanizing, heavily populated cities, causing an alarming number of premature deaths, as well as serious impacts on human health and the environment (Figure II.C.6). According to World Bank estimates, air pollution has emerged as the fourth leading risk factor for deaths worldwide. In China alone, there are over 1 million premature deaths annually from exposure to air pollution. Many actions that reduce GHG emissions from fossil fuels will simultaneously reduce emissions of other pollutants and generate significant improvements in local air quality.

Policy Choices

Whether climate and economic objectives are incompatible or mutually reinforcing is in part a question of policy choices. Due to various market failures and political economy considerations both within and across countries, market forces alone are unlikely to deliver the transition to the low carbon economy on the scale and at the pace required to effectively mitigate global climate risks (Box II.C.1). At the same time, the costs and benefits of climate action will not be evenly distributed, both domestically and internationally. The design of individual measures and overall policy packages will need to consider these varying impacts, aiming to enhance synergies and reduce trade-offs between the dual goals of curbing climate risks and achieving robust and inclusive growth in the region.

Figure II.C.6. Air pollution poses a serious health threat across developing EAP

Source: World Bank staff estimate based on WDI data.

Box II.C.1. Why is climate action not happening faster? Market failures, uncertainty, trade-offs and policy choices

While there is a growing consensus that the collective cost of delayed climate action could be enormous, choices by individual governments, firms and consumers will not appropriately account for the potentially devastating effects and catastrophic risks caused by unmitigated climate change. Climate choices are further complicated by intertemporal trade-offs because climate risks will accumulate beyond current generations, exceeding the time horizons of typical individual behavior (Carney 2015). This problem is compounded by uncertainty involved in predicting climate impacts and their complex and two-directional interactions with the economy.

Unless addressed, these market and related policy failures may lead to an undersupply of global climate change mitigation efforts and imply greater climate risks than would be socially optimal and intergenerationally fair. At the same time, there are real policy concerns about the present economic costs, the distributional implications, and global burden-sharing in addressing climate change. Policy frameworks need to be designed to correct for these market imperfections while addressing potential trade-offs and maximizing synergies between climate goals and other social and economic objectives and do all that under the following high levels of uncertainty:

- A. Aggregate economic impacts:** Policy makers are concerned whether it is possible to decarbonize their economies while maintaining robust economic growth. While early economic models indeed framed the optimal emissions path as a trade-off between the short-term cost of mitigation and expected benefits in terms of reduced climate-related losses for future generations (Nordhaus 2014), more recent research suggests that the trade-offs may be less sharp. One reason is that evidence suggests that technology adoption

(continued)

(Box II.C.1. continued)

and relative price developments are endogenous, nonlinear and subject to economies of scale, implying lower mitigation costs (Aghion et al. 2016; Stern 2015). For example, over the past decade the price of solar and wind technologies has fallen dramatically, electric lighting has become far more efficient and battery technology has enabled the emergence and rapid expansion electric vehicles. At the same time, traditional models have tended to underestimate present and future benefits of climate action. This is partly because of incomplete accounting of co-benefits in terms air quality, public health, and biodiversity benefits as well as growth-enhancing innovation and economic dynamism (Arezki et al. 2016; Coste et al. 2019; Heine and Black 2019). In addition, negative feedback loops and fat tail risks could cause severe economic damage, including through wealth destruction, reduction and volatility of income and growth, further bolstering the economic case for climate action (Stern 2015).

- B. Distributional impacts:** While there is growing evidence suggesting that there may be economic co-benefits to climate change mitigation and adaptation (Stern 2015), the costs and benefits of climate action will not be evenly distributed. The accelerated exit of polluting industries will inevitably lead to labor dislocation. At the same time, the more rapid depreciation of carbon related infrastructure implies stranded assets and financial losses for individual corporates and investors. In a similar vein, the burden of climate change impacts is varied geographically (Tol 2019) and across the income distribution and some of the populations most at risk may lack political agency and voice, especially in comparison to well organized vested interest that would stand to lose from a more rapid decarbonization path. Policies to engender the needed economic transformation, will therefore need to be accompanied by steps to ensure its costs and benefits are distributed fairly, not the least to ensure the necessary broad-based political support and to overcome resistance from vested interests.
- C. Global and regional spillovers:** Similar to the uneven domestic distribution of costs and benefits discussed above, individual countries may lack incentives for climate action, if they bear disproportionate costs but benefits accrue predominantly to other countries (IMF 2019). The cumulative nature of atmospheric greenhouse gases also implies that historical emissions as well as the level of income of individual countries should be factored into international burden sharing. These global spillovers and interdependence of policy choices across counties gives rise to international coordination problems but also create ample room for mutually beneficial global and regional collective action.

As the region recovers from COVID-19, there is an opportunity to recalibrate policy frameworks toward low carbon and resilient development. Policy makers in the region face complex policy challenges. Most economies remain well below full employment and potential growth, but fiscal space is increasingly constrained by rising public debt burdens in many countries, especially those with high levels of external debt denominated in foreign currency. Further fiscal support to secure the recovery will therefore need to be calibrated carefully, as discussed in the previous section of this report. Where fiscal space permits, additional fiscal stimulus measures could be aligned with medium-term policy objectives of low carbon development. This could be achieved by prioritizing measures that combine benefits for jobs and short-term recovery with longer-term impacts on resilience while avoiding investment in carbon-intensive infrastructure. While such alignment is desirable, it is important to recognize that cyclical policies in response to the current crisis can contribute to but will not be enough to achieve long-term decarbonization. It is therefore important to complement the greening of short-term measures with consistent medium-term policy shifts.

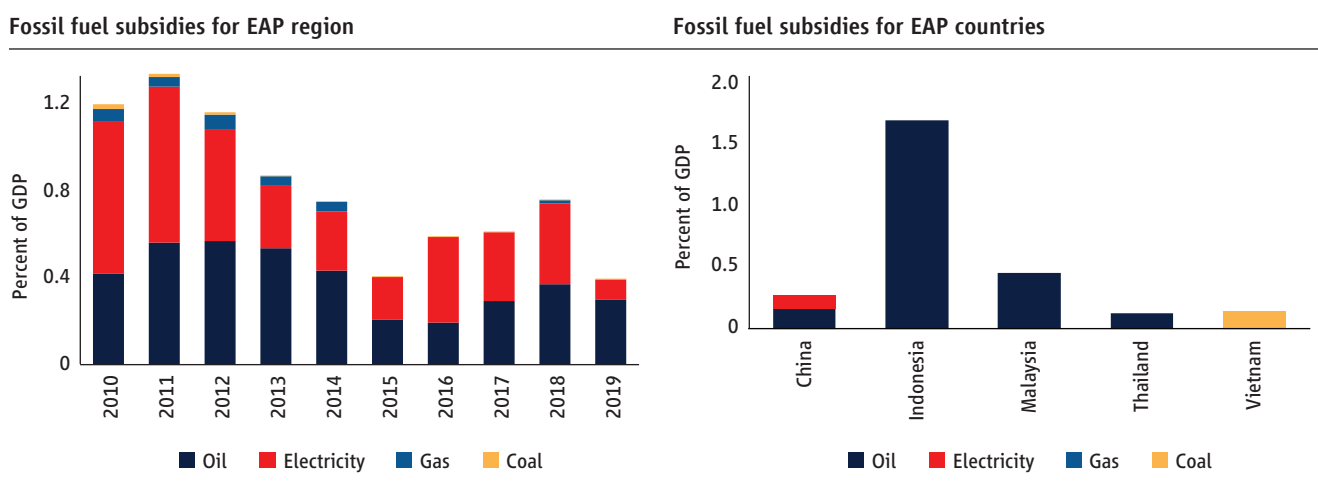
There is no uniform policy approach to drive low carbon and resilient development across the region, but a broad menu of policy options from which policy makers can choose. Depending on country circumstances, the policy agenda will need to balance policy efforts to reduce climate risks (mitigation) with efforts to increase resilience to them when they

do materialize (adaptation). The individual policy mix will also vary across countries. In smaller, low-income countries with relatively low levels of emissions but high exposure to disaster risks, for example small island states in the Pacific, marginal investment is needed to enhance adaptation and resilience. In larger, fast industrializing middle-income countries with rapidly growing emissions, mitigation action will merit greater attention in addition to resilience. A key macroeconomic policy concern is to ensure relative prices adequately reflect the social cost of carbon. In some countries this may involve correcting policy failures and distortions (eliminating fossil fuel subsidies, reforming energy tariffs, etc.) and addressing market failures (carbon pricing through carbon taxes or tradable emission rights). But getting prices right—while necessary—will not be enough to achieve decarbonization. Complementing market-based pricing instruments, additional policies are needed to support the shift to a low carbon development path, including public investment in low carbon and resilient infrastructure, as well as subsidies and tax incentives to encourage private investment and consumption and the development and adaptation of clean technologies. (World Bank 2021). Sectoral policy and regulatory frameworks in areas such as energy, urban planning, transport and forestry and agriculture may also need to be reformed to curb emissions in key emitting sectors or enhance resilience in sectors particularly vulnerable to climate impacts.

Phasing out fossil fuel and energy subsidies

Despite progress in reducing fossil fuel and energy subsidies, policy-induced price distortions remain in place in many countries across EAP. While there have been steps across the region to rationalize and eliminate various fossil fuel and energy subsidies over time, there are remaining subsidies for certain types of fuel and energy in several countries, including for oil (Malaysia and China), for kerosene, LPG, or diesel (Indonesia, Thailand and Vietnam) and for residential electricity (China, Vietnam, Malaysia and Indonesia) (Figure II.C.7). While intended to secure affordable energy, most of these subsidies tend to be regressive, fiscally inefficient and environmentally damaging because they discourage energy savings. Phasing out remaining fuel subsidies would better align incentives for more climate-friendly consumer behavior and greater energy efficiency. While energy prices have recovered from the lows recorded last year, they remain relatively subdued and price reforms may be considered especially once the recovery takes hold. These reforms would open fiscal space for other pro-poor public spending and experience in energy subsidy reforms globally, and the region suggests that accompanying energy price reforms with steps to mitigate social impacts especially on the poor can ensure equitable outcomes and broad-based support.

Figure II.C.7. Fossil fuel subsidies in selected EAP countries



Source: World Bank staff based on IEA data.
 Note: Oil includes kerosene and diesel.

Adjusting carbon prices

Carbon pricing is an effective but currently underutilized policy tool to drive efficient and economy-wide abatement in the East Asia and Pacific region. The economic arguments for carbon prices are clear. At the micro level they can ensure that prices charged to individual users of carbon intensive goods and services better reflect the resulting costs, including the social cost associated with rising climate impacts, incentivizing less carbon intensive behavior. At the macro level, the resulting relative price changes will raise the returns to green investment, fostering a reallocation of resources from high carbon-intensive into less carbon-intensive investment while stimulating innovation and green technology adoption. There are different design options to levy carbon charges. A carbon excise tax on fuel supply is the simplest and most efficient instrument. It is charged in proportion to the carbon content of fuel and a carbon price. Administratively, carbon taxes are an extension of well-established fuel taxes. An alternative, more complex solution are cap-and-trade emission trading schemes (ETSs) under which the government sets a cap on total emissions and allocates—typically by auction or some other allocation mechanism—tradable emission rights to market players. The emissions price is then discovered by market trading of these emission rights. Given limited coverage of most ETSs, several countries have used ETSs with complementary carbon taxes applying to sectors not covered by the ETS.

While there are plans to introduce carbon prices in several countries in the region, only China has started to apply one in practice. Worldwide there are 64 carbon pricing initiatives under implementation or being planned. Together these would cover about 22 percent of global emission. Carbon prices range from less than US\$1/tCO_{2e} to US\$119/tCO_{2e}, with almost half of the covered emissions priced at less than US\$10/tCO_{2e}, well below the estimated carbon prices of US\$40–80/tCO₂ by 2020 and US\$50–100/tCO₂ by 2030, required to cost-effectively reduce emissions in line with the temperature goals of the Paris Agreement (World Bank 2020). Within developing East Asia, China is the only country that has started to implement a national ETS scheme but in Indonesia, Thailand and Vietnam similar schemes are under consideration. After piloting subnational ETS over several years, China rolled out a national ETS scheme earlier this year, initially covering the power sector which accounts for 26 percent of China's total emissions.

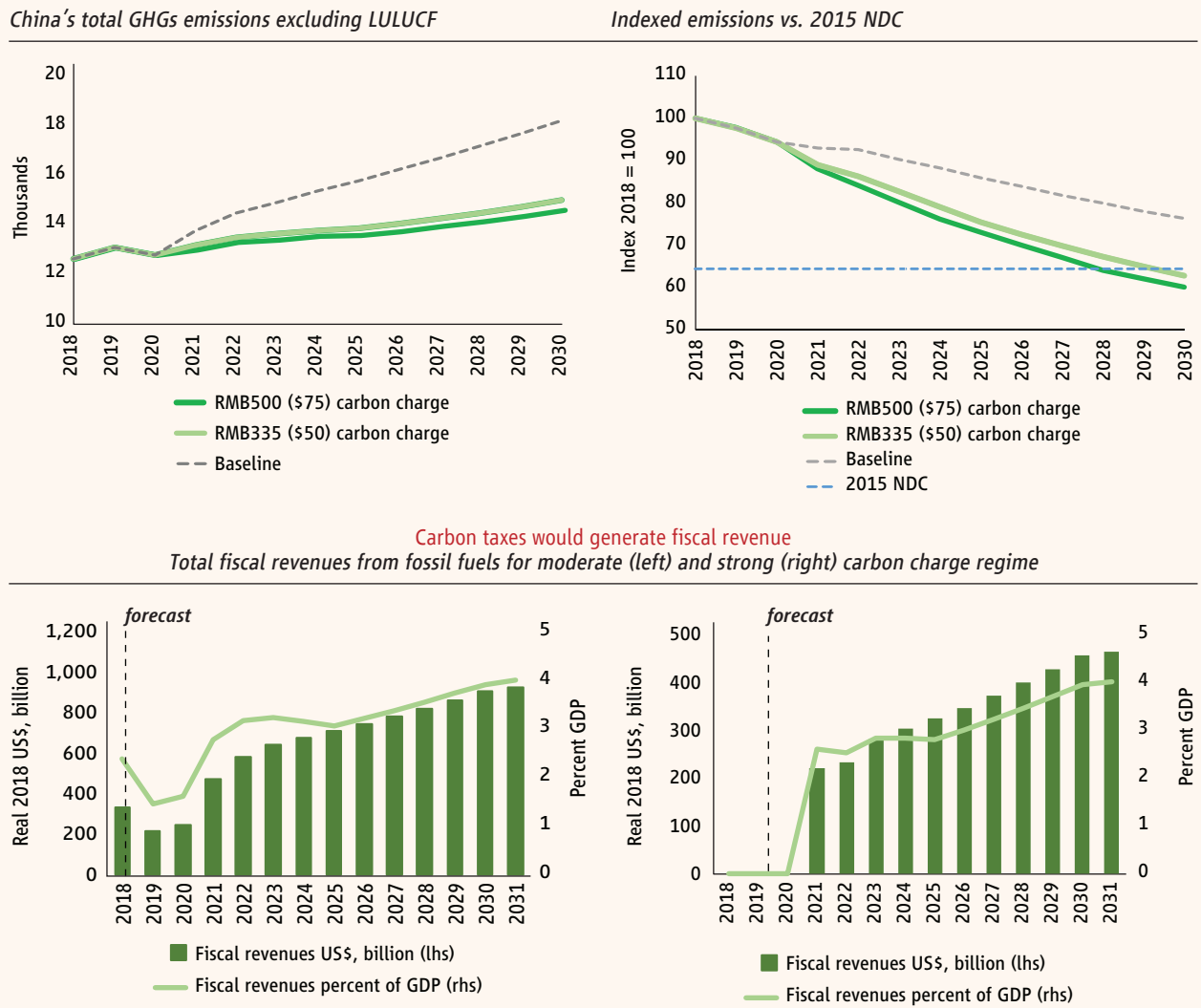
Carbon pricing and other fiscal instruments can reinforce each other and mitigate adverse efficiency and equity impacts. Without considering the climate and other co-benefits, carbon taxes are likely to lead to welfare losses. In addition, the poor may lose even if distributional impacts are not regressive. These adverse effects can be mitigated if the revenue generated by carbon pricing is recycled back into the economy to subsidize abatement costs, offset negative social impacts and rebalance the tax mix by cutting other distortionary taxes on labor, general consumption or profits. Simulations have shown that revenue neutral carbon tax reforms can reduce the non-environmental welfare losses otherwise associated with carbon taxes and under certain circumstances, such as large informal sectors, even result in a more efficient, less distortive tax system (Carson et al. 2019) (see Box II.C.2).

While immediate tax hikes may neither be economically desirable nor politically feasible during a time of acute economic distress, establishing forward-looking carbon pricing commitments with clear price trajectories can create price signals to drive investment decisions—without immediately burdening businesses and households. Since public debt and budget pressures have risen sharply and are likely to persist, governments will need to consider options for restoring fiscal discipline once the recovery takes hold (see also previous section). Introducing carbon taxes could help bolster revenues while raising the incentives for a low carbon transition.

Box II.C.2. Fiscal foundations of carbon neutrality—simulating impacts of carbon charges in China

China’s commitment to carbon neutrality by 2060 is a major policy shift with near-term ramifications. Carbon charges could make a major contribution to emissions reductions in the near term, while achieving multiple other social, environmental and economic objectives. To illustrate the potential impact of carbon charging in China, two potential designs were considered. First, a ‘moderate carbon charge’ (RMB170/US\$25 per tCO₂ in 2021, rising to MB340/US\$50 by 2030, based on current exchange rates) and a ‘strong carbon charge’ (RMB340/US\$50 per tCO₂ in 2021, rising to RMB500/US\$75 by 2030). Revenues were split equally between increases in public investment and lump-sum transfers (Figure II.C.B2.1).

Figure II.C.B2.1. Carbon charges could induce significant emission reductions



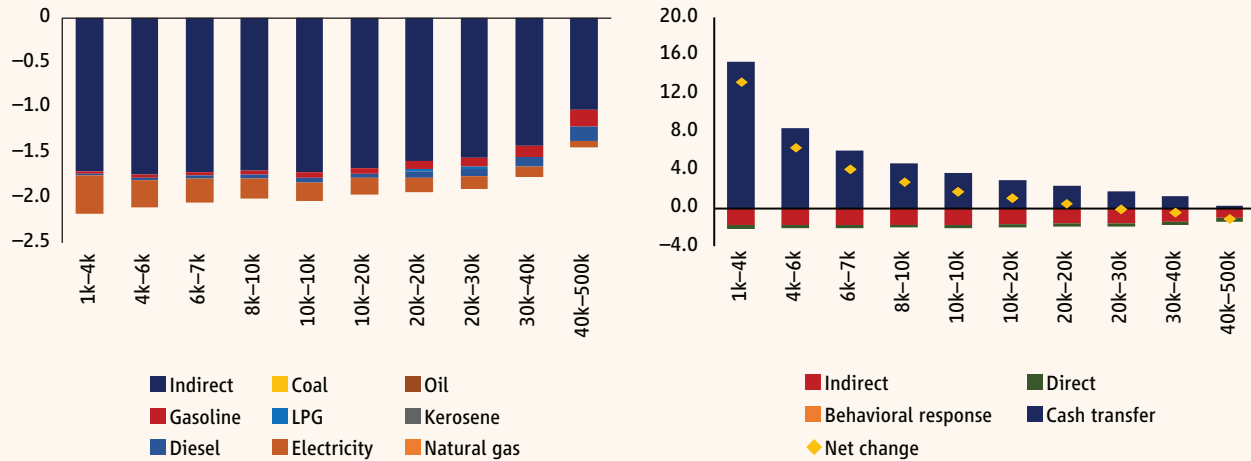
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(Box II.C.2. continued)

Regressive distributional impacts could be mitigated by recycling parts of the revenues as transfers

Direct impact on household consumption without mitigation

Direct impact on household consumption after transfers



Source: Simon Black 2020, Fiscal Foundations of Carbon Neutrality, Policy Note prepared with Carbon Pricing Assessment Tool.

Key findings:

- Carbon charges could be a central lever to help China accelerate its decarbonization efforts. Both a moderate and a strong carbon charge would help China achieve its 2015 climate commitment of Nationally Determined Contribution (NDC) on carbon intensity, though additional efforts may be needed to ensure that emissions peak in the decade. The 'moderate' and 'strong' carbon charges could keep emissions to about 15 gt.CO₂ and 14.1 gt.CO₂ by 2030, respectively, thereby abating 2 to 2.9 gt.CO₂ per year. Under both scenarios China would achieve its 2015 NDC target of reducing CO₂ intensity of GDP by 62.5 percent in 2030 compared with 2005.
- Carbon charges could raise substantial revenues. Potential additional revenues from fossil fuels could be about \$456bn (2.0 percent GDP) or US\$621bn (2.7 percent GDP) by 2030 against a baseline of maintaining the existing excise regime. These revenues can make a substantive contribution to China's post-COVID-19 efforts and its Fourteenth Five Year Plan (2021–25). For example, the revenues could fund a 25 percent or 44 percent increase in health expenditures or a 67 percent or 120 percent increase in education expenditures.
- Recycling revenue can mitigate negative impacts on the poor. Illustrative examples suggest that rebating revenues to citizens directly via targeted or untargeted transfers can reduce poverty and increase equity. The bottom two deciles and rural Chinese benefit disproportionately if half of revenues used to fund lump-sum transfers. Alternatively, these revenues could fund a 25–44 percent increase in health expenditures or a 67–120 percent increase in education expenditures, both of which would benefit poorer Chinese.
- The remaining half of the revenues could be used to fund various other objectives, such as dealing with transition risks. Using revenues to fund green public investments could boost medium-term GDP growth by the end of the decade by about 0.6 ppts, though greening existing public investment flows may be preferable.

(continued)

(Box II.C.2. continued)

Alternatively, enhanced fiscal space could help deal with transition risks, for example compensating coal producing regions, or absorbing losses from stranded assets.

- Lastly, carbon charges could help improve health outcomes of Chinese citizens: air pollution concentrations (PM2.5) would decline, helping avert about 1.7 million deaths of by 2030. Air pollution is major cause of premature deaths in China, accounting for about 1.5 million deaths annually. Cutting fossil fuel combustion would reduce concentrations of PM2.5 and around 1.7 million deaths cumulatively 2021–30. In addition, costly road accidents could be reduced, saving about 16,000 lives by 2030, and congestion—a rising problem for urban Chinese—could be reduced, especially where substitute forms of mobility (e.g., public transport) are available.
- While imposing some deadweight losses like any other tax, the simulations suggest carbon charges could generate overall welfare benefits of about 3.5 percent of GDP by 2030 from reduced air pollution and road deaths, and avoided climate damages worth.

Fostering green public investment in low carbon and resilient infrastructure

On the spending side, public investment can support both climate change mitigation and adaptation. Public infrastructure investments can help lock in low-carbon technologies for example in public transport, energy and urban infrastructures. It can also help foster low-carbon innovation and generate economies of scale. At the macroeconomic level, public investment could mitigate structural demand weakness which predates COVID-19 (Rachel and Summers 2019) but has been exacerbated by the pandemic which further dampened private investment and spurred higher levels of precautionary savings (Blanchard 2019). While the short-term demand impacts of public investment are country and project specific, there is some evidence suggesting short-term fiscal multipliers and employment intensity of some green investments are comparable to traditional infrastructure investment (IEA 2020; Agrawala et al. 2020; Popp et al. 2020). Which specific green investment should be prioritized will depend on country circumstances but options abound: renewable energy, energy-efficiency of public buildings, nature-based solutions, such as reforestation and other ecosystem restoration efforts, EV infrastructure, urban public mass transportation, and sponge cities, etc. Even more traditional infrastructure investments can be made greener by ensuring application of environmental safeguards and by assessing climate risks and using climate resilient designs that reduce exposure and/or vulnerability of infrastructure assets, and hence minimize risk-adjusted lifecycle costs.

Low carbon sectoral policy frameworks in key emitting sectors

Sectoral policy and regulatory frameworks in areas such as energy, urban planning, transport and forestry and agriculture may also need to be reformed to curb emissions and enhance resilience. This includes large emitting sectors such as energy, transport, urban planning, industry, agriculture and forestry, as well as sectors that are vulnerable to climate impacts and hence require resilience-focused adjustments, such as water, urban planning and agriculture. The specific reform agendas necessarily vary across countries and within countries across sectors, but typical examples of policy misalignments include (i) power market designs that do not provide price signals and incentives for investment in low

carbon, capital intensive power generation technologies (see Box II.C.3 for energy sector reforms and transition in Vietnam), (ii) urban planning systems that encourage sprawl and fail to integrate land use and sustainable transport systems; (iii) infrastructure service pricing and tariffs (road tolls, electricity tariffs, etc.) that do not reflect costs and discourage low-carbon consumer choices, and (iv) agricultural policies and subsidies that encourage overuse of fertilizers and other environmentally harmful practices. Correcting such sectoral policy misalignments are important complements to economy-wide instruments, such as carbon taxes.

Ensuring a just transition

The transition to a greener growth path implies a faster exit from polluting industries, which will cause labor dislocation and financial losses. As a result, firms and workers in carbon intensive sectors such as coal, cement, steel, and other heavy industries, and palm oil will face significant transition risks. Some coal mining communities and regions are especially at risk because of a lack of other jobs because their economic fortunes are tied to coal and coal-related heavy industries. These communities may thus oppose reforms to mitigate climate change. Policies need to be designed to address these likely negative social consequences of the low carbon transition. Flexible factor markets enable efficient economic adjustment combined with robust social safety nets to protect workers and reskilling to enable them to find alternative employment. In addition, place-based interventions can support efforts to diversify exposed local economies away from carbon-intensive activities.

Embracing global and regional collaboration

The global nature of the climate challenge calls for global collective action. While policy solutions should be by country specific circumstances, there are high returns to coordination. Divergence of policies among countries and lack of coordination can hinder collective efforts. If some countries implement carbon taxes, while others continue to subsidize fossil fuels, this will not only impair effectiveness of climate action but potentially influence trade relationships. On the other hand, there is ample room for mutually beneficially collective action to harness positive environmental and economic spillovers from the discovery and diffusion of green technologies (Box II.C.3) to more cross-border green investment.

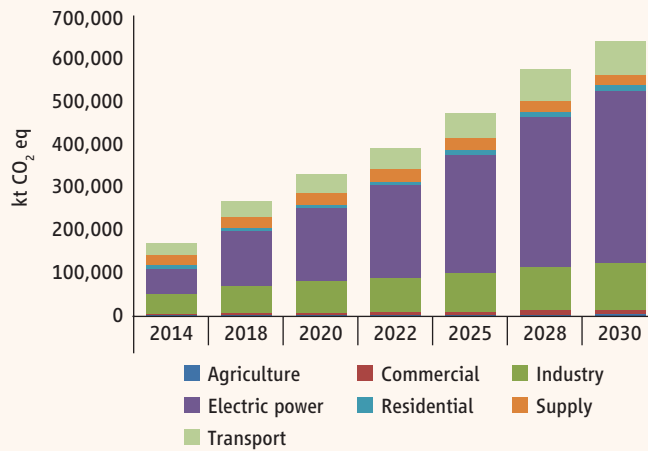
The powerful case for climate action by developing EAP should not, however, obscure the persistent inequities in per capita emissions between industrial and developing countries. Ideally, developing countries would not be trapped between the Scylla of domestic carbon taxes and the Charybdis of border taxes, and be induced to take stronger climate action than is nationally optimal without external assistance. In that sense, instituting carbon border adjustment taxes would ideally be a complement rather a substitute for assistance where it is needed.

Box II.C.3. Clean energy transition in Vietnam

Vietnam’s success in the energy sector has come at the cost of environmental degradation

Vietnam has been highly successful in providing universal electrification (99 percent in 2020) and in keeping pace with double-digit growth in electricity demand in the past two decades (installed capacity increased from 5 GW in 2000 to 58 GW in 2020). However, coal has become the dominant source of electricity generation with installed capacity increasing fourfold (from 5 GW in 2010 to 20 GW in 2020). In the business as usual scenario (BAU), coal power would increase further threefold (from 20 GW to 63 GW) between 2020 and 2030 while annual GHG emissions would double from 300 mtCO₂ to over 600 mtCO₂ equivalent (Figure II.C.B3.1). The past decades have also witnessed a deterioration in the energy intensity of the economy due to energy inefficient industrial and commercial enterprises. Energy elasticity of the GDP is about 1.8, which is higher than most other ASEAN countries.

Figure II.C.B3.1. Projected increase in GHG emissions by sector in BAU scenario (by 2030)

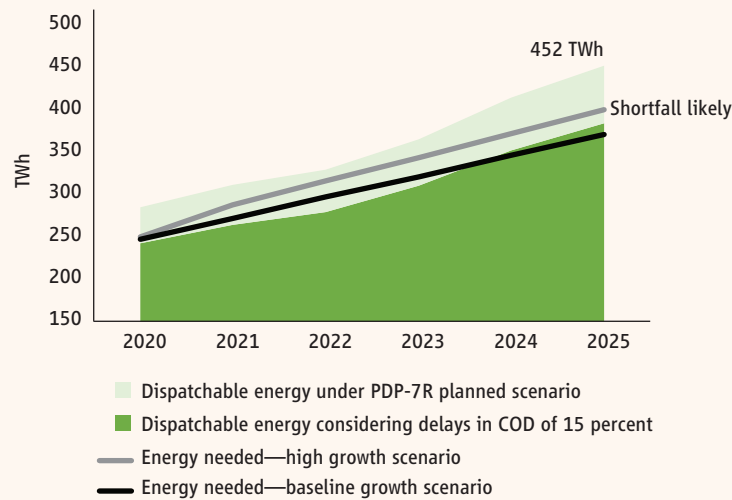


Source: Vietnam’s Ministry of Industry and Trade (MOIT)—Assessment of Vietnam Energy Sector NDC Ambition, December 2019.

While the demand of electricity continues to grow, Vietnam faces difficult trade-offs

As a fast-developing country, Vietnam’s demand for electricity will continue to grow at 7 percent annually, requiring it to double the installed capacity of power system from 58 GW in 2020 to 127 GW by 2030. Without adequate supply, an energy shortfall of 4–10 TWh (equivalent to about 1–3 percent of demand) is expected between 2021–25 (Figure II.C.B3.2) which can impact GDP growth by about 0.5–1.0 percent. Coal transition needs to occur while considering trade-offs: maintaining energy security and financial viability of sector, while not jeopardizing growth prospects.

(continued)

*(Box II.C.3. continued)***Figure II.C.B3.2. Vietnam expects shortfall of energy between 2021–25**

Source: Vietnam's Ministry of Industry and Trade (MOIT)—Assessment of Vietnam Energy Sector NDC Ambition, December 2019.

The government is demonstrating commitment to phasing out coal in a staged approach

The new power sector master plan is expected to reduce the footprint of planned coal-based power generation from 63 GW to 35 GW while scaling-up renewable energy from 12 GW to 36 GW (Figure II.C.B3.3) making it the largest capacity category. In order to moderate demand of electricity, a national energy efficiency plan has been launched which aims to improve overall energy efficiency by 8–10 percent by 2030. Energy sector actions (both renewable energy development and energy efficiency) are at the heart of Vietnam's revised Nationally Determined Commitment (NDC) which aims at reducing GHG emissions by 27 percent by 2030 with international support (9 percent using domestic resources), when compared to the BAU scenario.

Transition to a clean energy system also entails overcoming operational challenges

The speed of reduction of coal power will depend on how fast reliable and cost-effective alternatives can be brought online. The government is incentivizing investments in renewable energy through a feed-in-tariff policy (transitioning to competitive auctions in 2021) with nearly 15 GW of solar power installed in just the past two years (as much as all South-East Asian countries combined). However, Vietnam is already facing severe challenges of curtailment of its recently added renewable energy generation capacity (up to 40 percent in some months) due to lack of system balancing assets and grid capacity constraints. Utilization of renewable energy requires additional complementary investments otherwise there is a high risk of the renewable energy projects becoming stranded assets.

Investment decisions in the power sector are made on a 'total system cost' basis

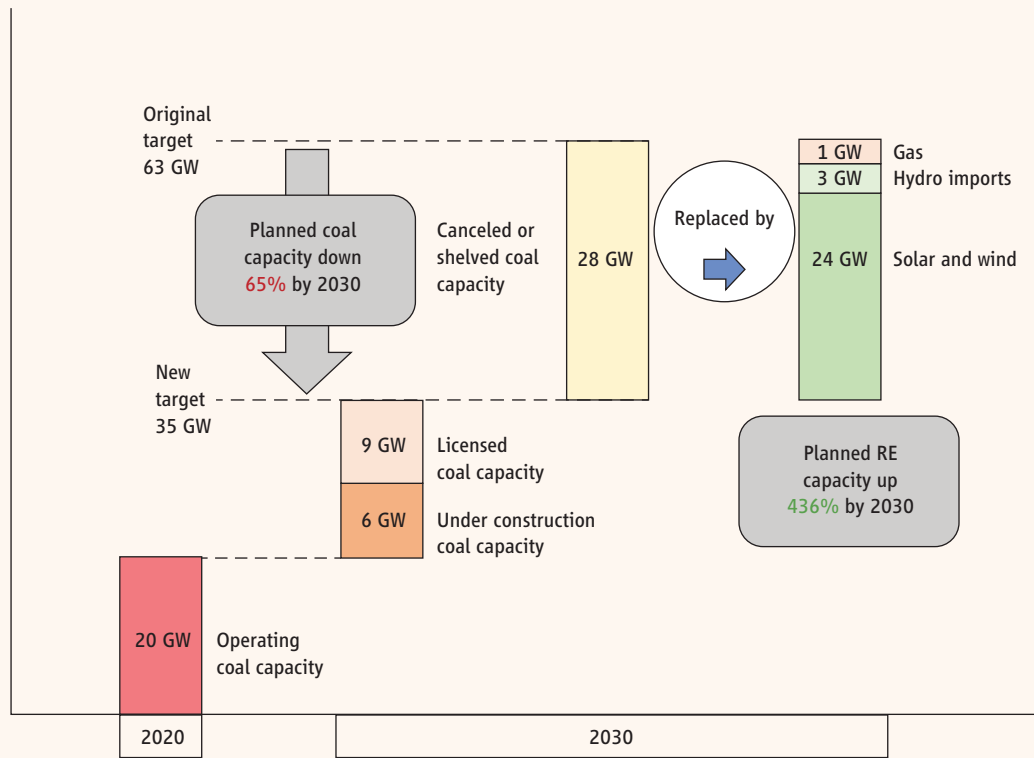
Replacing coal which provides a 24-hour baseload solution with investment in renewable energy (solar and wind) installed capacity which typically provides about an 8-hour solution is not enough (Figure II.C.B3.4). Additional investments in variability management assets, a backup baseload (when renewable energy is not available), and network grid integration equipment is required. This drives up the total cost of the power system. Power system

(continued)

(Box II.C.3. continued)

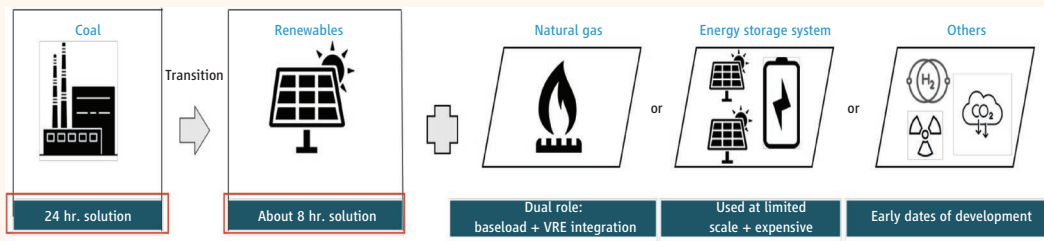
planners take this overall cost into consideration when making investment decisions. In Vietnam, like in most other countries, power system investment decisions are based on a financial cost-benefit analysis. There are opportunities to expand this assessment to include additional external factors such as cost to the environment, health, local industry, and job creation aspects of renewable energy industries.

Figure II.C.B3.3. Vietnam’s NDCs and corresponding actions within the energy sector



Source: Vietnam’s Ministry of Industry and Trade (MOIT)—Assessment of Vietnam Energy Sector NDC Ambition, December 2019.

Figure II.C.B3.4. Transition from coal to renewable requires additional complementary investments



Source: Vietnam’s Ministry of Industry and Trade (MOIT)—Assessment of Vietnam Energy Sector NDC Ambition, December 2019.

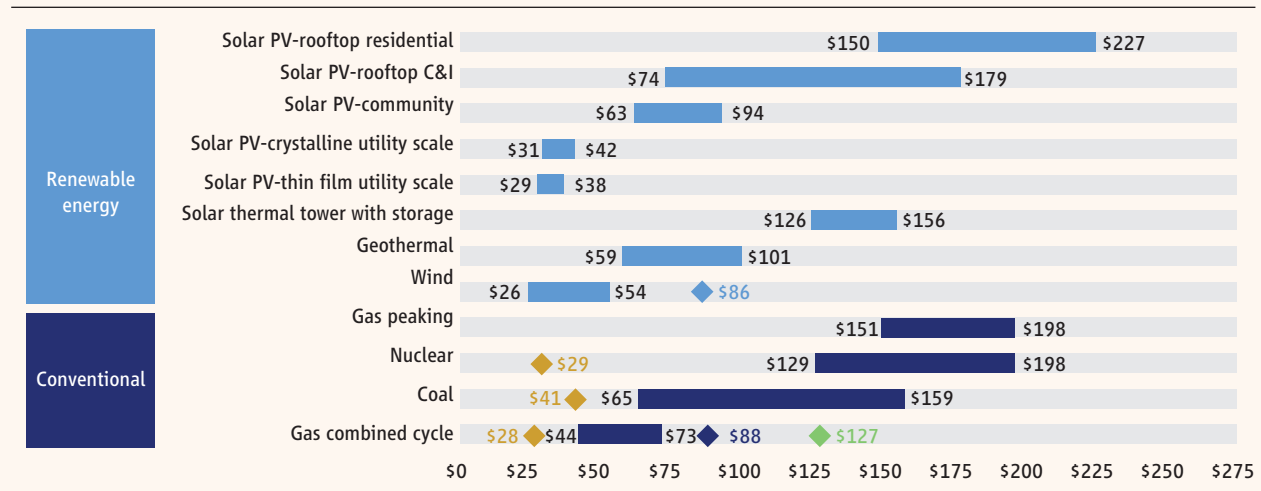
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(Box II.C.3. continued)

Vietnam uses industry standard cost projections of assessing alternative technologies as part of decision making

As part of the power system planning process, assessment is carried out of relevant alternative technologies which complement renewable energy and can accelerate the transition away from coal—this assessment is updated periodically and is based on industry standard cost projections (such as, International Energy Agency, [IEA]). Assessment includes an evaluation of natural gas, energy storage systems (such as, batteries and pumped hydropower), as well as other technologies (e.g., hydrogen, nuclear, carbon capture and sequestration [CCS]). While many of these technologies are cost-prohibitive at this stage in Vietnam (or have other safety and security risks), large scale cost reductions could improve their viability. Currently, natural gas is a competitive option for Vietnam which can play a vital role as an alternative to coal and a flexible power generation source which can ramp up and down with the adequate speed required for renewable energy (Figure II.C.B3.5). Investment in natural gas power plants is unlikely to become stranded assets in the near term as these power plants are fungible assets with can be retrofitted with hydrogen as well as CCS to further improve their value proposition.

Figure II.C.B3.5. Estimates of levelized cost of electricity of various sources (\$/MWh)



Source: <https://www.lazard.com/perspective/levelized-cost-of-energy-and-levelized-cost-of-storage-2020/>

Vietnam requires international support for mobilization of higher up-front financing costs of clean energy transition

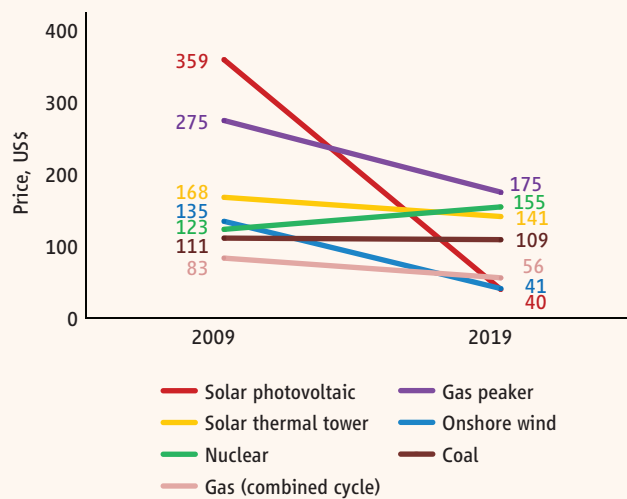
Achieving a low carbon pathway envisioned in the NDC will require 20–30 percent more investment (US\$120–130 billion compare to US\$100 billion in a BAU scenario), which includes estimated investment required for renewable energy as well as energy efficiency technologies, and continued policy reform and capacity strengthening. While electricity tariff reform (estimated increase from US cents 8.5/kWh to about US cents 12/kWh by 2025) would be needed based on system costs, international support (especially concessional climate financing) would be critical. The World Bank is providing comprehensive policy advice, technical assistance, and capacity development, as well as financing, where necessary. In the past two decades, World Bank has provided financing of about US\$5 billion for energy sector development in Vietnam. Going forward, scaled-up investment support for clean energy transition will be necessary.

Box II.C.4. Technology change and falling costs of renewable energy

As the world and the EAP region search for affordable yet effective ways to accelerate the path to carbon neutrality, technological progress is likely to play a key part.

Technological progress has already reduced the cost of renewable energy. Figure II.C.B4.1 shows the dramatic drop in the cost of solar photovoltaic (PV) over the last decade compared to other sources of power. The cost of solar power has declined by over 80 percent from US\$359/MWh to US\$40/MWh, by far the fastest decline of all power sources over this period.

Figure II.C.B4.1. Price of electricity from new power plants



Source: Roser (2020).

Note: Electricity prices are expressed in “levelized costs of energy” (LCOE). LCOE captures the cost of building the power plant itself as well as the ongoing costs for fuel and operating the powerplant over its lifetime.

As demand for solar power rises, innovation and economies of scale enable costs to decline, hence, allowing solar PV technology to enter new applications, which further stimulate demand, and so on—a virtuous cycle. The “learning rate” is the average cost reduction experienced for every doubling of cumulative installed capacity.

Utility-scale solar PV had an estimated learning rate of 36 percent over the period 2010 to 2019, the highest of all sources of energy. Onshore wind has a learning rate for the cost of electricity of 23 percent. For both solar PV and onshore wind, improvements in technology have driven the cost reductions and capacity increases. In 2019, over 50 percent of newly commissioned utility-scale renewable power generation capacity worldwide produced electricity at a lower cost than the cheapest new source of fossil fuel-fired power (IRENA 2020, Roser 2020).

These favorable cost trends are expected to continue in the future. Overall, renewable energy is set to account for 95 percent of the net increase in global power capacity through 2025, with solar PV accounting for 60 percent and wind 30 percent. Total installed wind and solar PV capacity is set to surpass natural gas in 2023 and coal in 2024 (International Energy Agency 2020).

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