

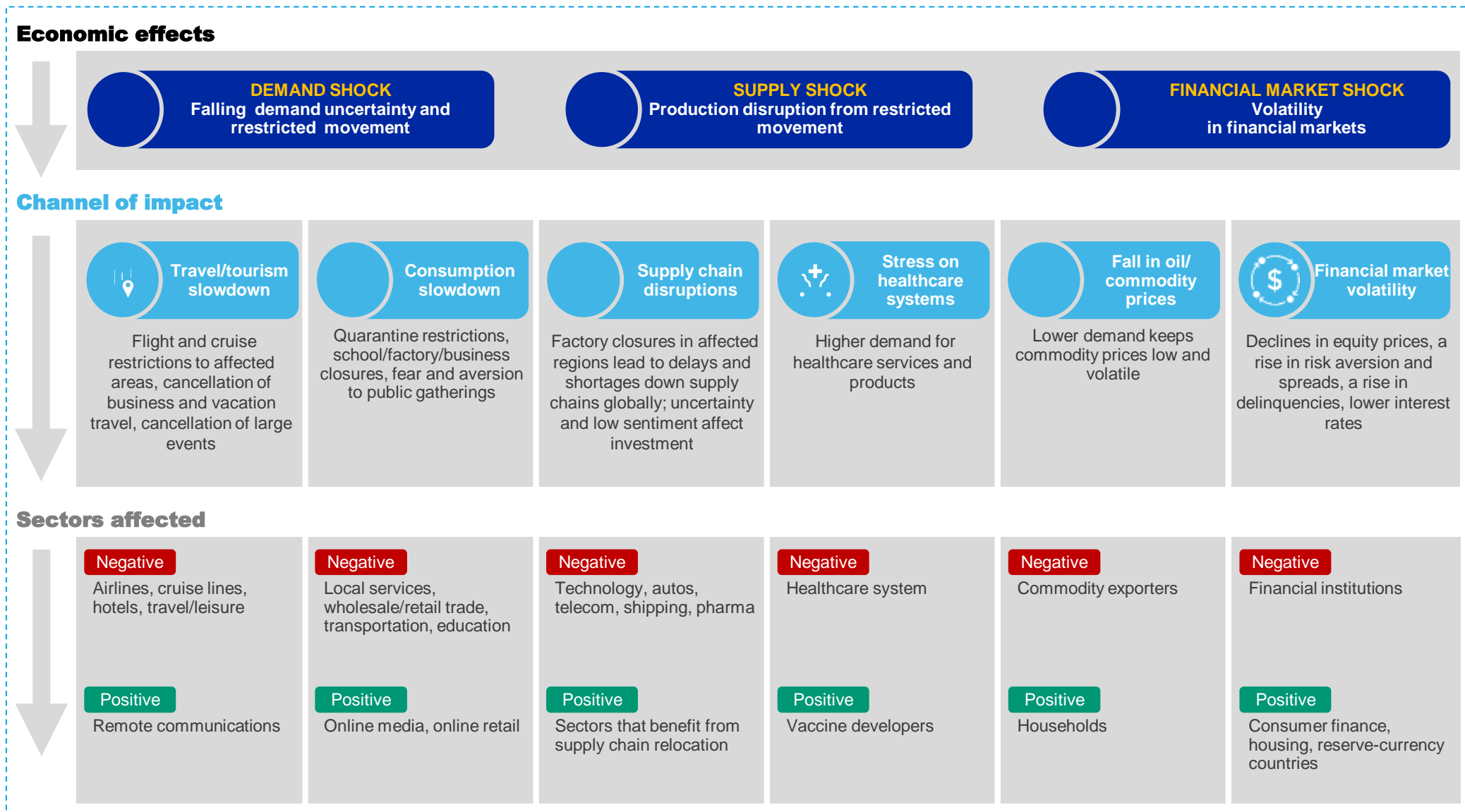
MOODY'S
INVESTORS SERVICE

Access is everything™

Richard Cantor, Chief Credit Officer

May 2020

Channels of coronavirus economic impact



Source: Moody's Investors Service

Differences between this crisis and the global financial crisis

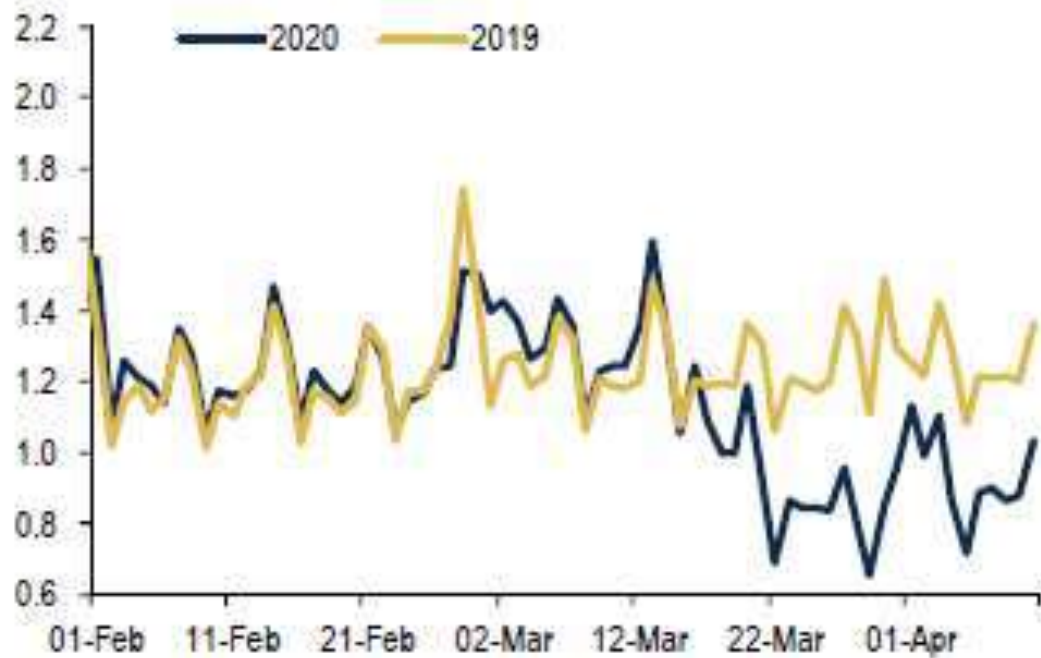
Stronger banking system	✓	✗	Supply, as well as a demand, shock
Stronger consumer balance sheets	✓	✗	Asia, as well as the West, impacted
Established government playbooks	✓	✗	Lower fiscal headroom for sovereigns
Coherent and rapid policy response	✓	✗	Greater corporate leverage
Improved Eurozone institutions	✓	✗	Global leadership vacuum

Credit Implications

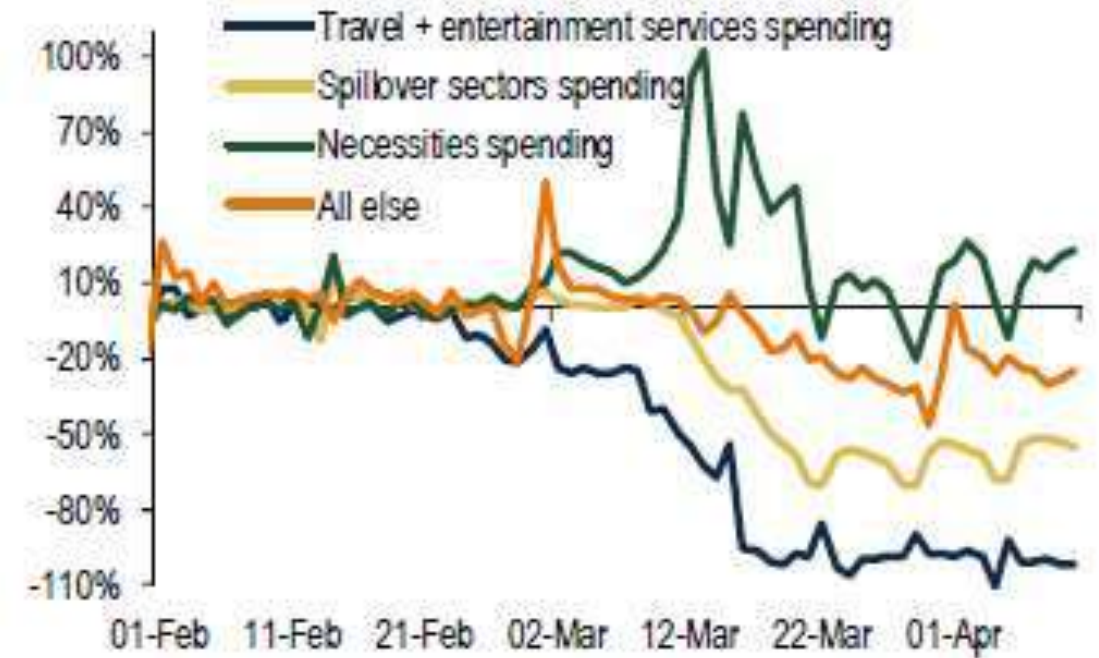
- Greater rating transition risk for corporates & CLOs
- Lower rating transition risk for financial banks and other structured finance
- Sovereigns further burdened, but not saddled with banking bailouts

Credit card spending reveals drivers of US spending collapse

Daily total card spending, based on BAC aggregated card data (index, Jan 1st 2020 =1)



Aggregated daily spending by major categories (% yoy)



Source: Bank of America: COVID-19 and the US economy, 2020

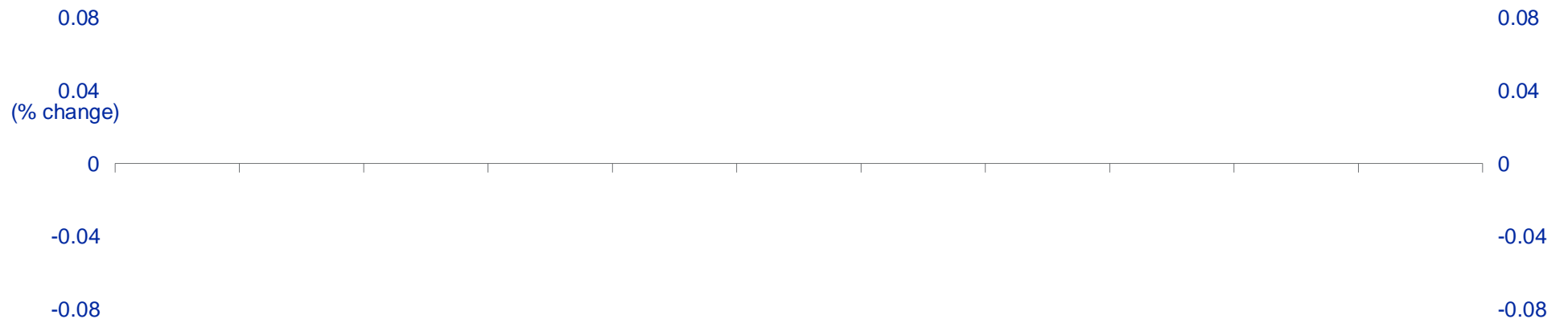
Global economic collapse will be followed by a modest recovery

» Growth expectations for 2020:

- G-20 advanced economies (AEs) will contract by 5.8%
- G-20 emerging market countries (EMs) ex China will contract by 3.5%
- China will grow by 1%

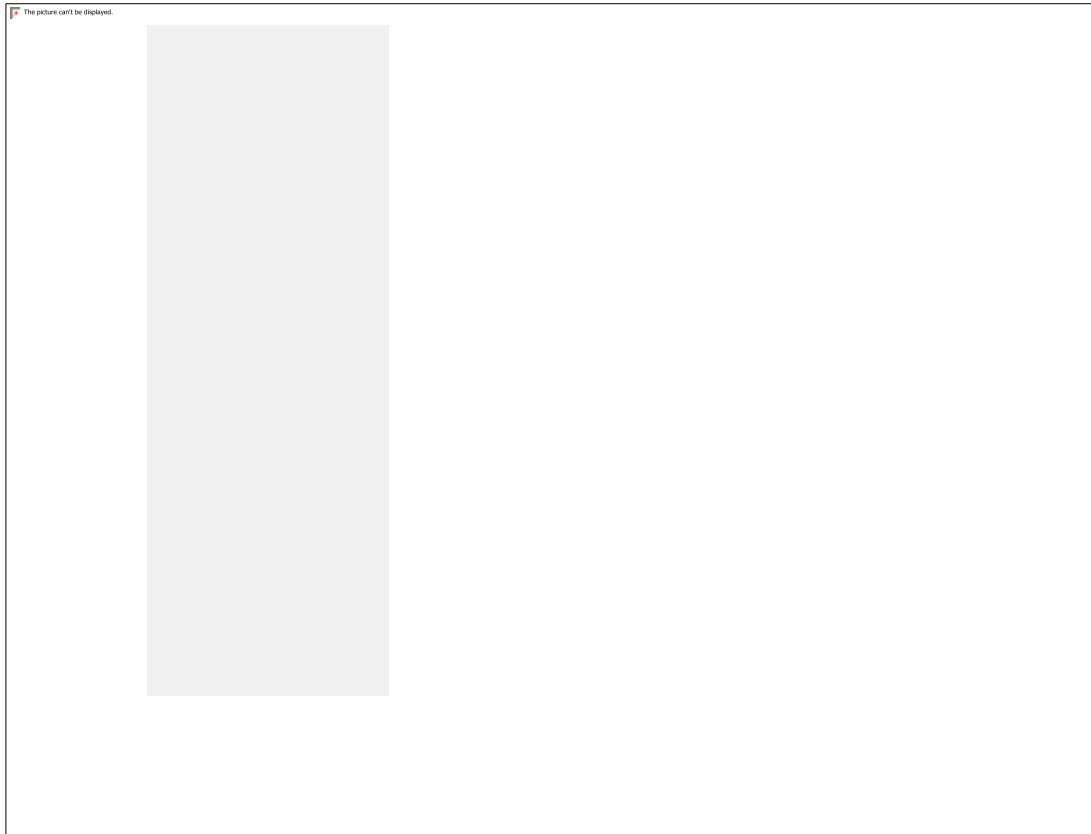
Real GDP growth forecast (%) for G20 Economies 2020-21 (April 28, 2020 Update)

» Even with a gradual recovery, we expect 2021 real GDP to be below pre-coronavirus levels for most AEs

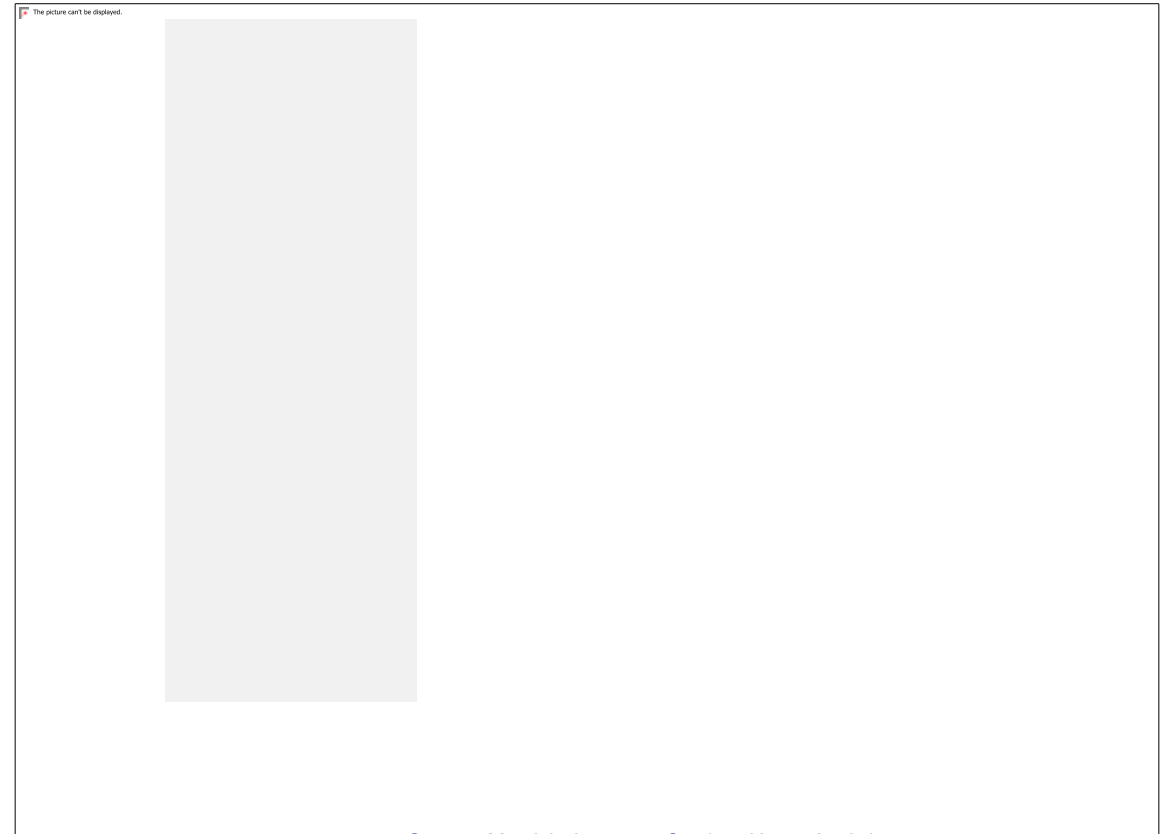


Recession will be deeper & recovery will take longer than GFC

G-20 Real GDP growth in aggregate



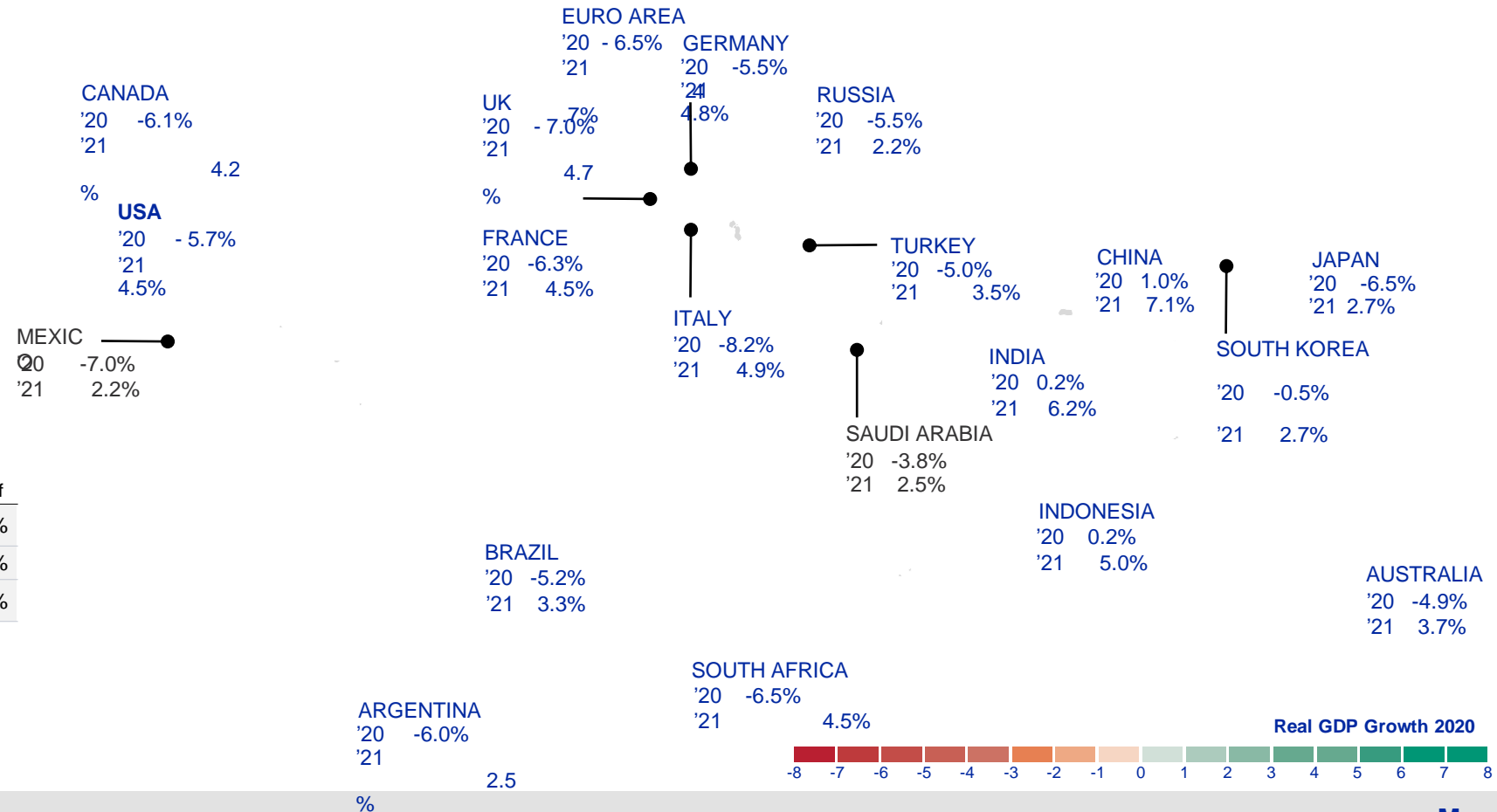
G-20 GDP level in aggregate



Source: Moody's Investors Service, Haver Analytics.

India and China alone in G20 to avoid negative growth in 2020

Real GDP growth forecast (%) for G20 Economies 2020-21 (April 28, 2020 Update)



	2019	2020f	2021f
G-20	1.7%	-5.8%	4.2%
Advanced	4.3%	-1.0%	5.7%
G-20 Emerging	2.7%	-4.0%	4.8%
G-20 All			

Source: Moody's Investors Service

Global macroeconomic outlook for the G-20 countries, 2020-21

Economies	Real GDP Growth				GDP loss compared to pre-coronavirus baseline	
	19	2020F	2021F	20F	21F	21F
G-20	19			20F	21F	
Advanced	1.7			-5.8	4.2	
US	2.3			-5.7	4.5	-7.3%
Euro area	1.2			-6.5	4.7	-7.6%
Japan	0.7			-6.5	2.7	-6.8%
Germany	0.6			-5.5	4.8	-6.4%
UK	1.4			-7.0	4.7	-7.9%
France	1.3			-6.3	4.5	-7.6%
Italy	0.3			-8.2	4.9	-8.7%
Canada	1.6			-6.1	4.2	-7.6%
Australia	1.8			-4.9	3.7	-7.0%
South Korea	2.0			-0.5	2.7	-2.5%
Emerging	4.3			-1.0	5.7	
China	6.1			1.0	7.1	-4.6%
India	5.3			0.2	6.2	-6.0%
Brazil	1.1			-5.2	3.3	-7.0%
Russia	1.3			-5.5	2.2	-6.9%
Mexico	-0.1			-7.0	2.2	-8.2%
Indonesia	5.0			0.2	5.0	-4.3%
Turkey	0.7			-5.0	3.5	-7.8%
Saudi Arabia	0.3			-3.8	2.5	-6.2%
Argentina	-2.2			-6.0	2.5	-3.6%
South Africa	0.2			-6.5	4.5	-7.4%
All	2.7			-4.0	4.8	

Growth forecast adjustment from the previous outlook

X.X Adjustment < 0.3 pp **X.X** An upward adjustment ≥ 0.3 pp **X.X** A downward adjustment ≥ 0.3 pp

Risks to growth remain to the downside



Upside risks ...



The availability of a vaccine or effective treatment more quickly than expected would support:

- A resumption of economic activity on a steadier basis
- Improved consumer and business confidence



Downside risks ...



New outbreaks in H2: A resurgence of the virus could cause further lockdowns and make it harder for governments to finance and implement support measures and transfers



Financial stress: Asset quality will decline if longer or repeated shutdowns increase business closures and keep the unemployment rate elevated. Increased margin pressure in the financial sector would add to economic and financial strains



Behavioral shifts: Permanent changes in consumption and business behavior would disrupt some sectors and supply chains, causing a structural change in the pace of economic activity



Lack of global coordination: Without countries working together to combat the virus' spread, risks of a resurgence and more severe economic outcomes are high

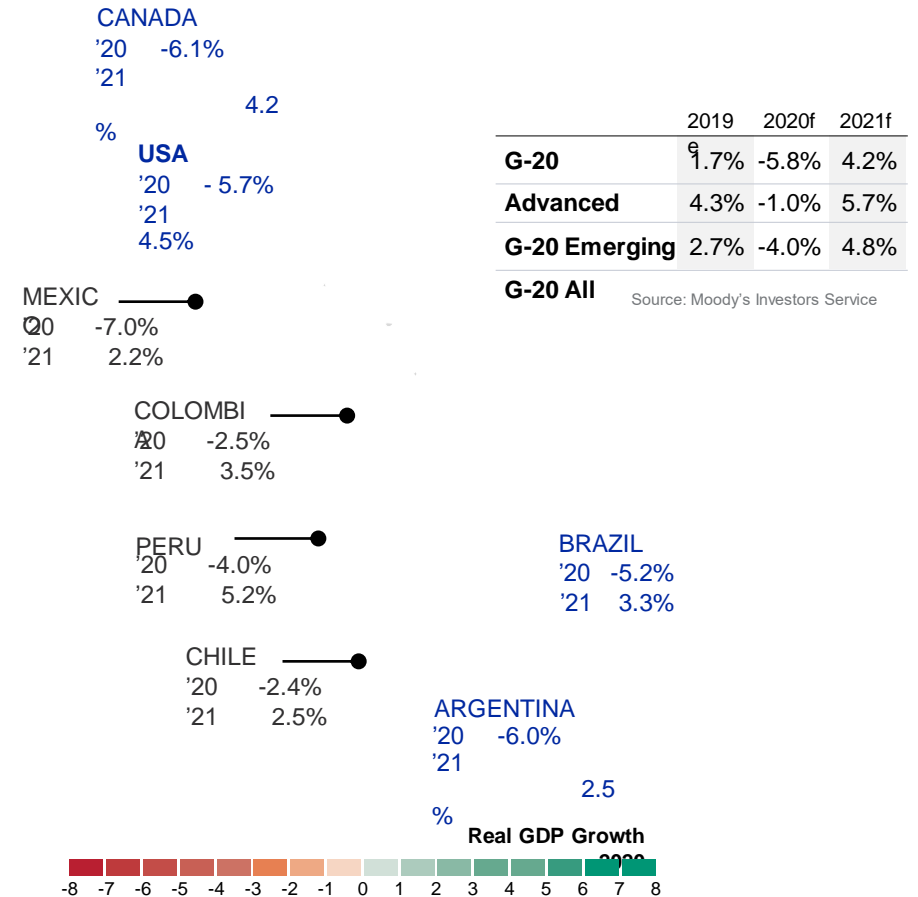


The coronavirus brings the regional economy to a standstill

Real GDP growth forecast (%) 2020-21 (Various projection dates)

2020	2021	2022	Projection Date
1.1	-2.4	2.5	March 31
3.3	-2.5	3.5	April 23
2.2	-4.0	5.2	April 27
1.1	-5.2	3.3	April 28 (G-20 Update)
-0.1	-7.0	2.2	April 28 (G-20 Update)
-2.2	-6.0	2.5	April 28 (G-20 Update)

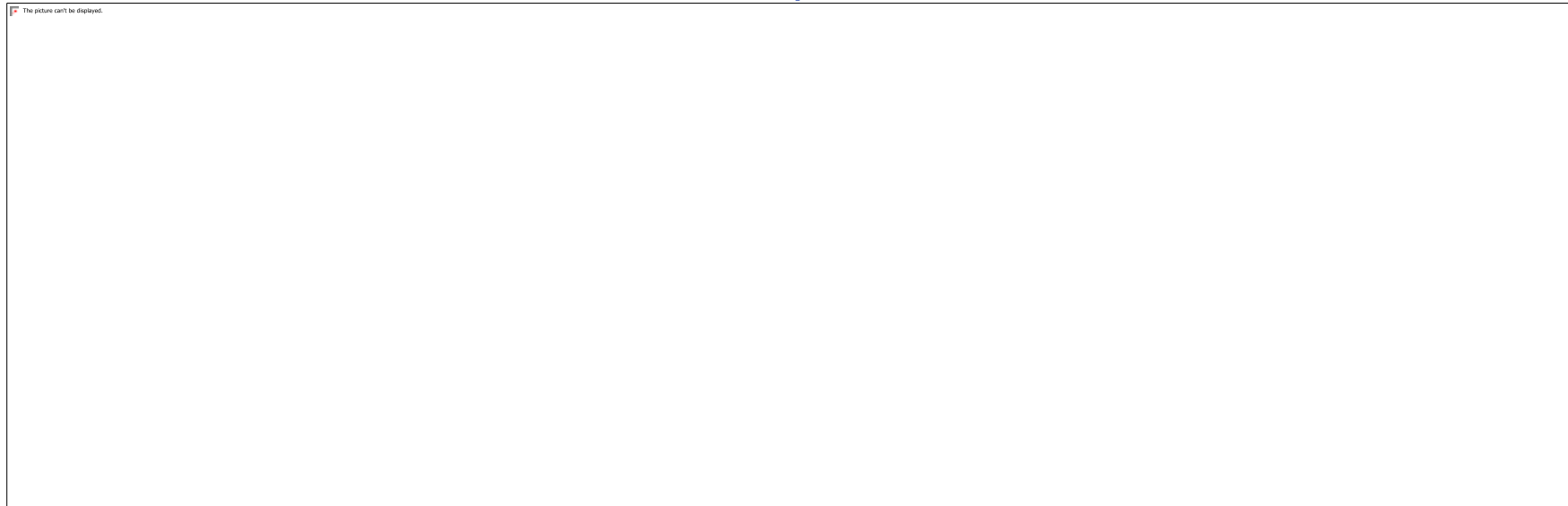
Real GDP growth forecast (%) 2020-21 (April 28, 2020 Update)



Oil prices have fallen sharply with a collapse in oil demand

- » Precipitous fall in oil demand has created a glut in the oil market despite OPEC+ cuts.
 - For 2020, expect Brent spot price to average \$35 per barrel; WTI spot to average \$30 per barrel
 - For 2021, expect Brent to average \$45 per barrel; WTI to average \$40 per barrel.

Global Oil Spot Prices

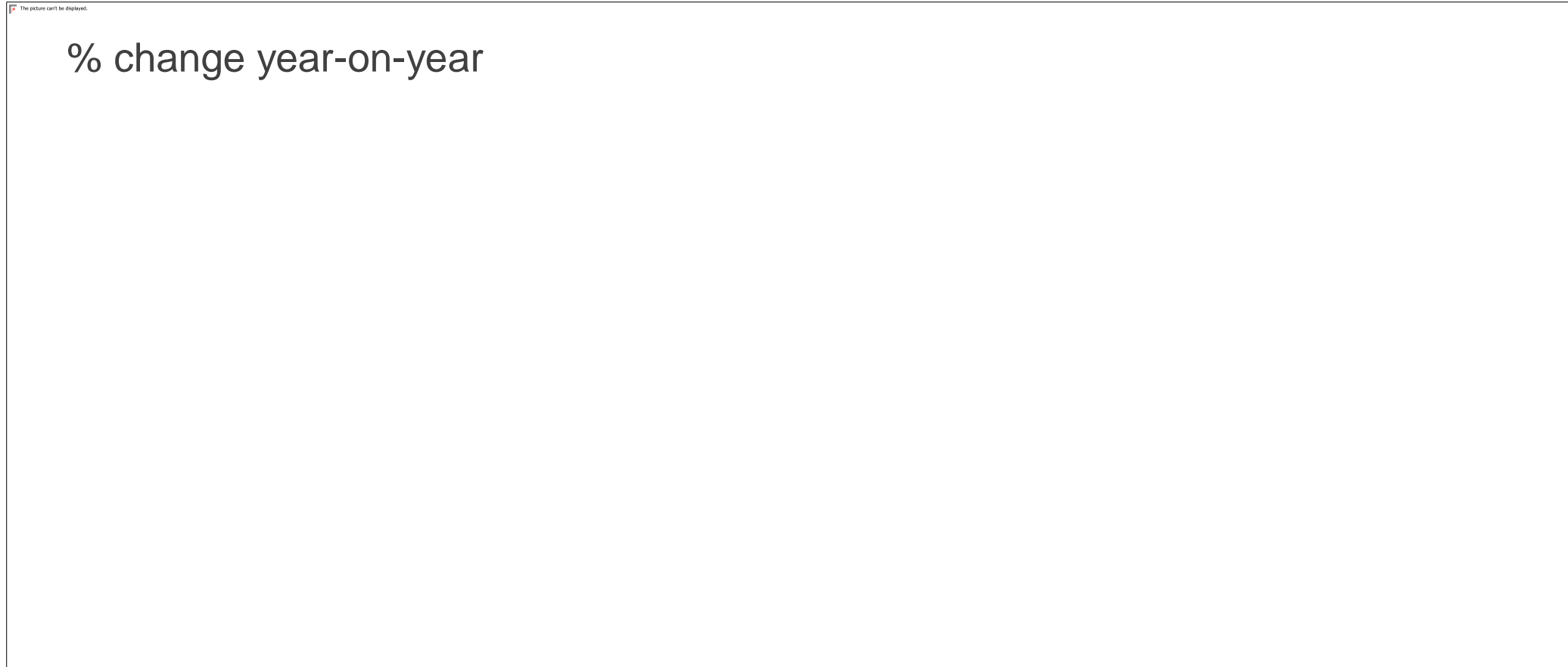


Data and chart as of April 30
Source: Haver Analytics

Source: Moody's Investors Service, Haver Analytics.

Low oil prices will weigh on EM equities

Brent crude price and EM stock performance

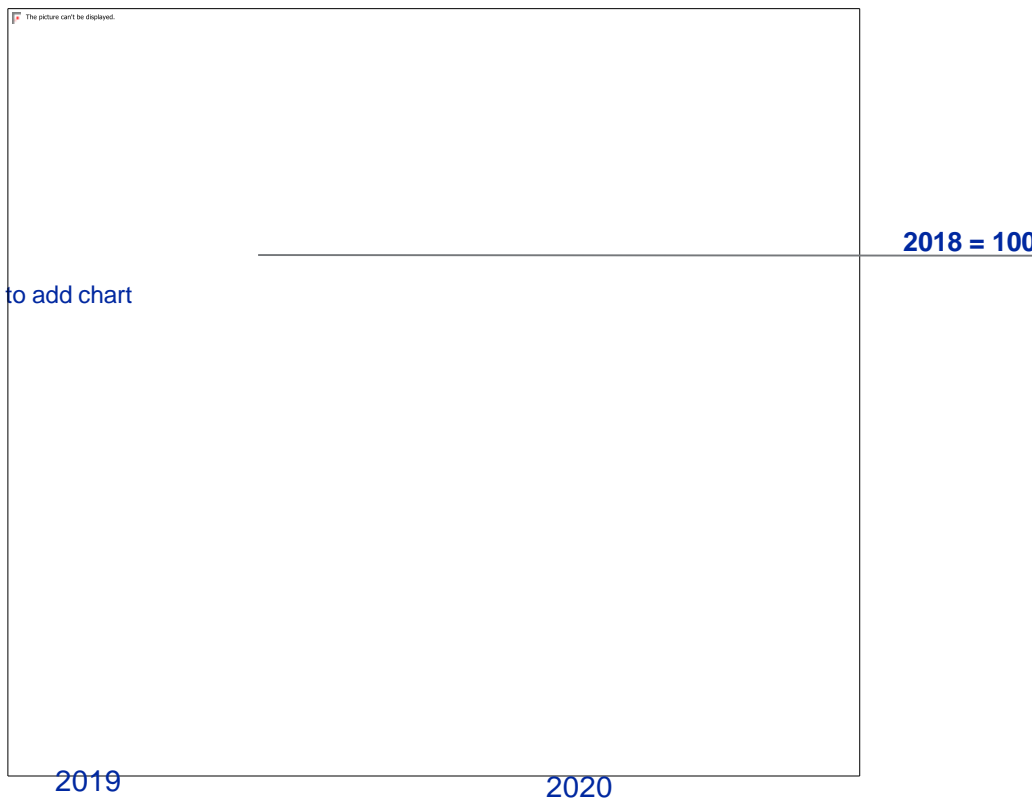


Sources: Moody's Investors Service, MSCI, Haver Analytics

As will the fall in non-precious metal prices

Commodity prices

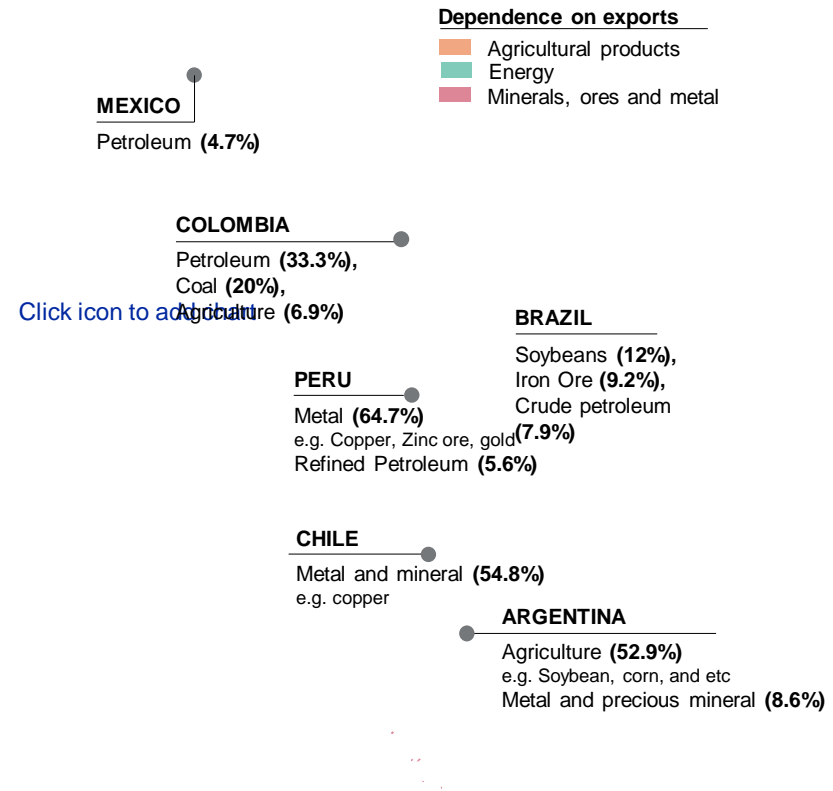
Data as of April 27, 2020



Click icon to add chart

Sources: Haver Analytics

Main commodity exports (as shares of total exports)



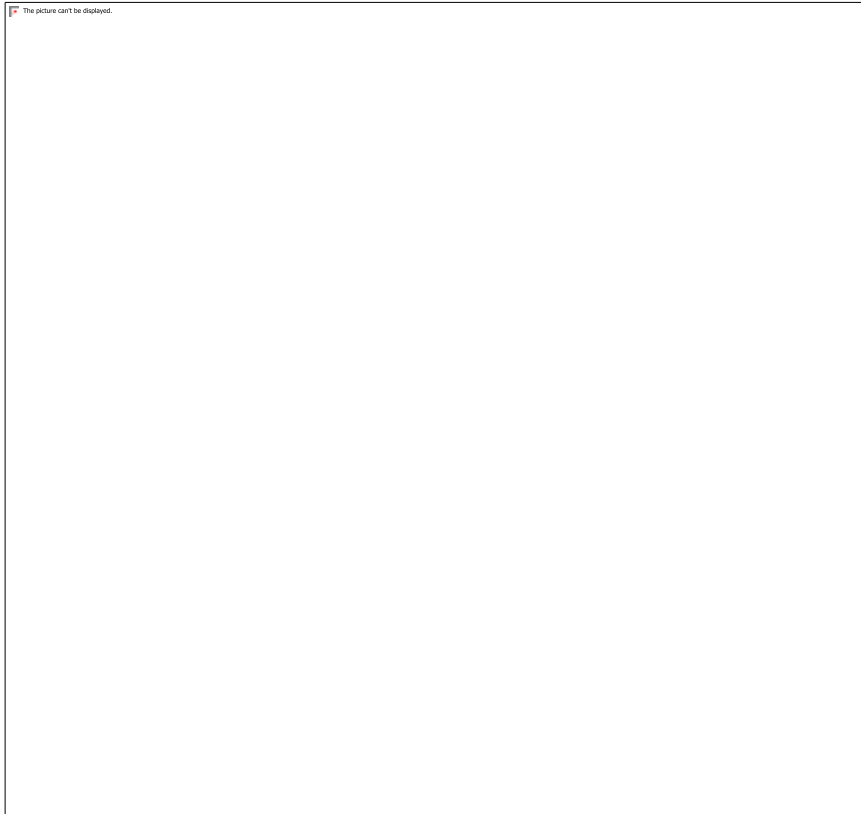
Click icon to add chart

Sources: World Trade Organization, Moody's Investors Service, Observatory of Economic Complexity

Portfolio flows to emerging markets have dried up

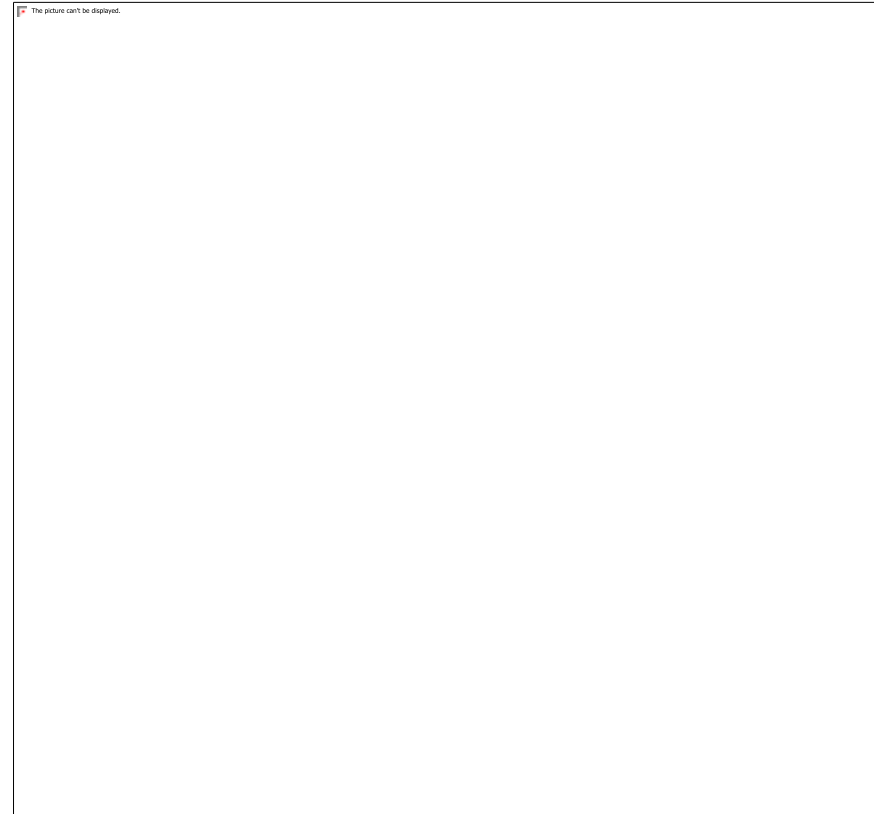
Cumulative nonresident capital flows to EMs

Stocks and bonds, in \$ billions
Data as of April 13, 2020



Depreciation against US dollar

Year to date through April 30, 2020



Source: Institute of International Finance, Moody's Investors Service, Haver Analytics.

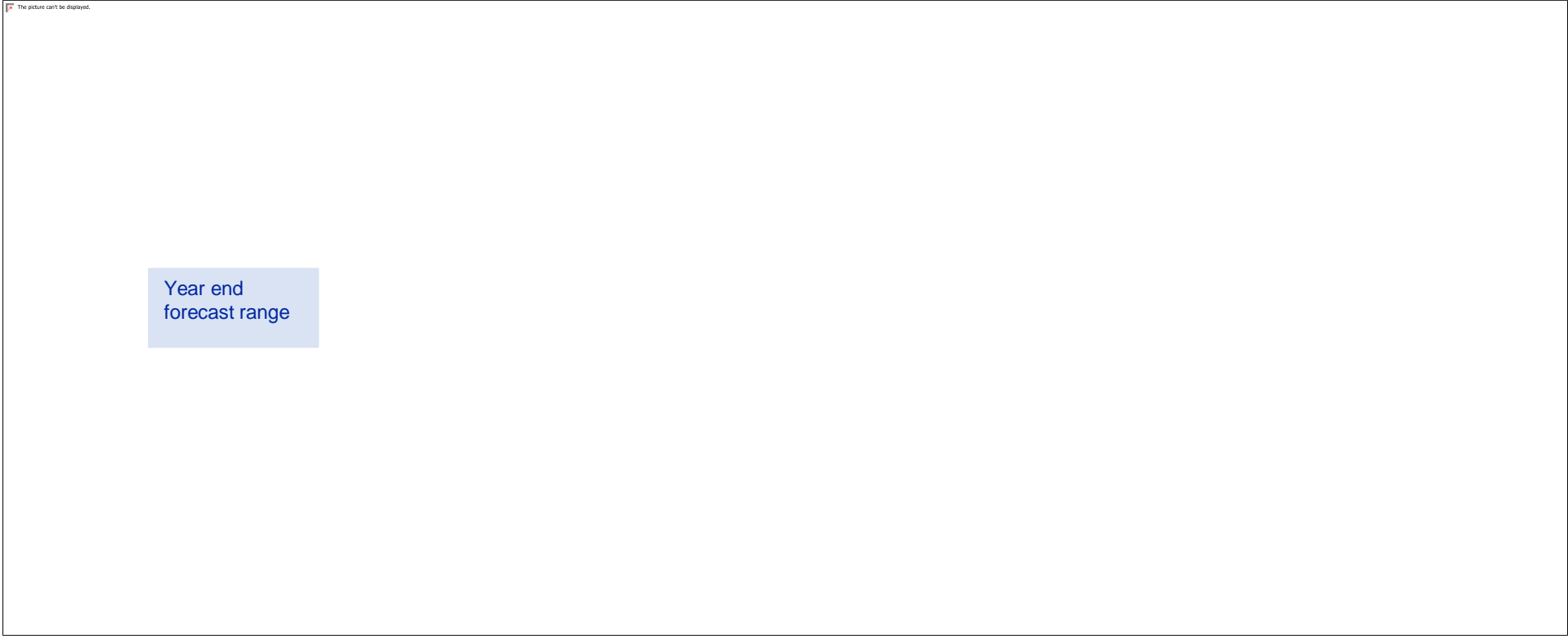
EM external and fiscal deficits vary across regions



Note: To strip out extreme outliers, regional aggregates use a trimmed mean that excludes the lowest 5% and highest 5% of values for each region. Bubble size is equivalent to the estimated general government debt-to-GDP ratio in 2019.
Source: Moody's Investors Service

EM corporate defaults will rise significantly

Trailing 12-month EM speculative-grade default rate, %



The upper and lower bounds of the forecast range are based on the respective pessimistic and baseline scenarios
Source: Moody's Investors Service

After the lockdown: longer-term challenges

Unwinding of policy stimulus

US-China relations

Climate change



Deglobalization risks

Onshoring in advanced economies

Income inequality

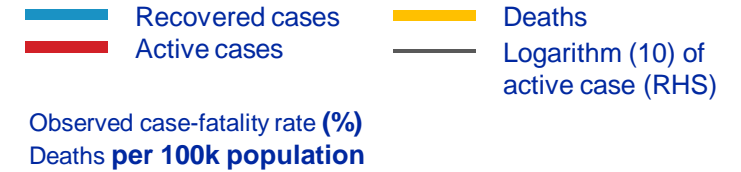
Appendix

Coronavirus Infection Curves and Latin American Policy Responses

Coronavirus infection curve

WORLD

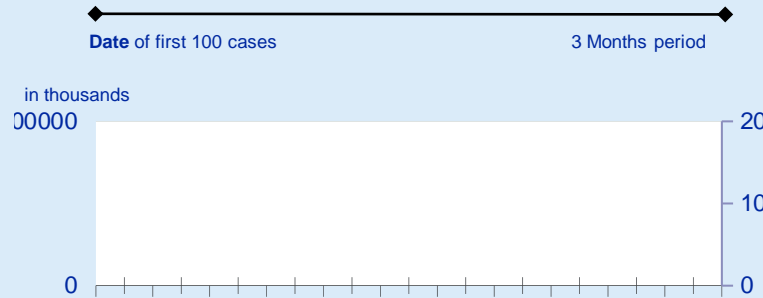
Globally, there have been **3.0 million** confirmed cases of the coronavirus, including **207,000+** deaths, as of April 27, 2020



G-20 Advanced

US

5.7%
16.8 per 100K



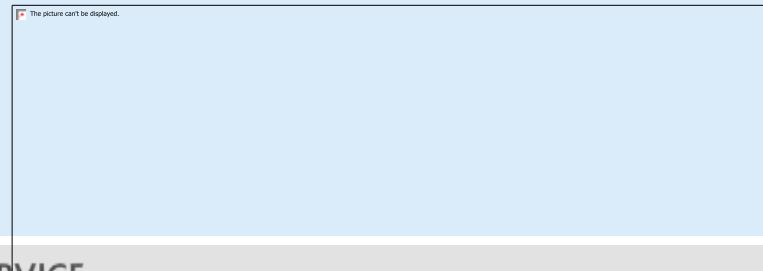
GERMANY

3.8%
7.2 per 100K



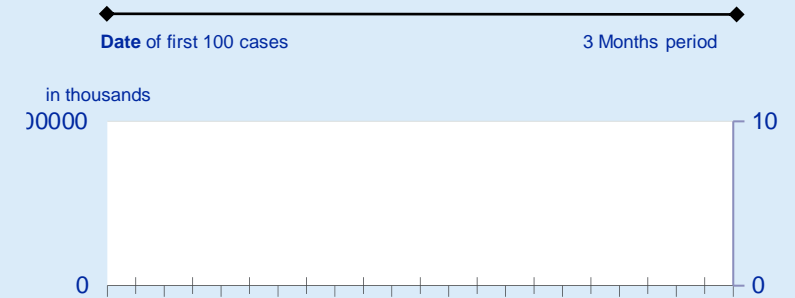
JAPAN

2.8%
0.3 per 100K



UK

13.5%
31.3 per 100K



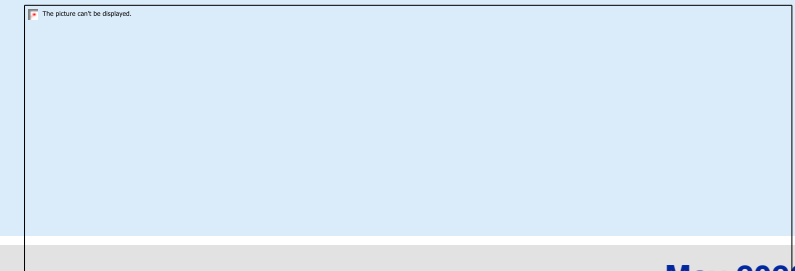
FRANCE

14.1%
34.2 per 100K



ITALY

13.5%
44.1 per 100K



Coronavirus infection curve

WORLD

Globally, there have been **3.0 million** confirmed cases of the coronavirus, including **207,000+** deaths, as of April 27, 2020

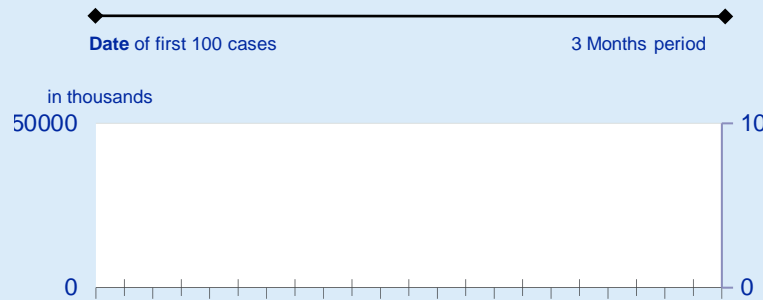
Recovered cases
Active cases
Deaths
Logarithm (10) of active case (RHS)
Observed case-fatality rate (%)
Deaths per 100k population

G-20 Emerging

BRAZIL

6.8%

2.1 per 100K



CHINA

5.5%

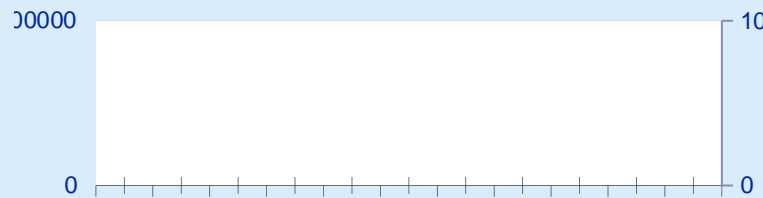
0.3 per 100K



TURKEY

2.5%

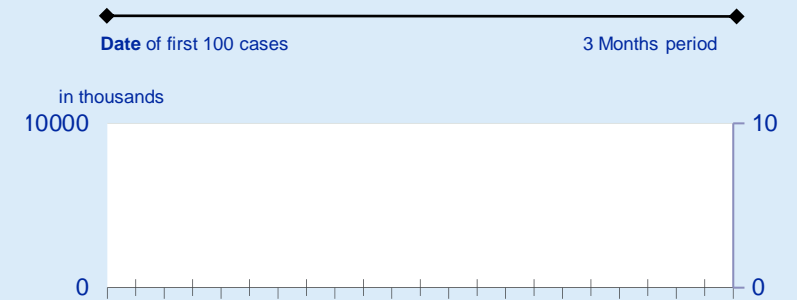
3.4 per 100K



MEXICO

9.2%

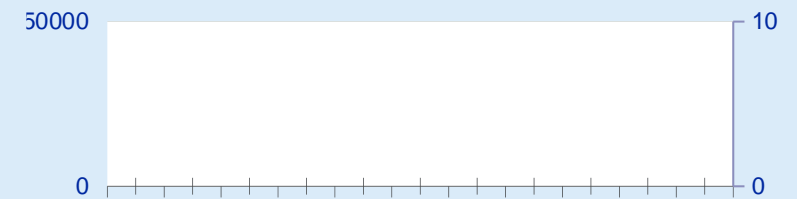
1.1 per 100K



INDIA

3.2%

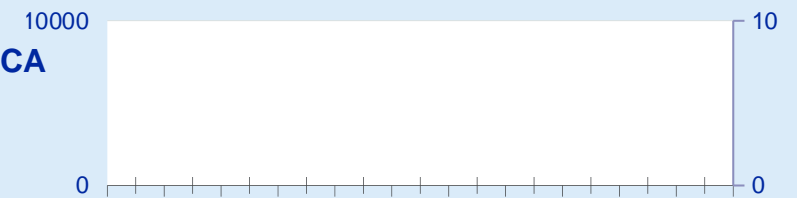
0.1 per 100K



SOUTH AFRICA

1.9%

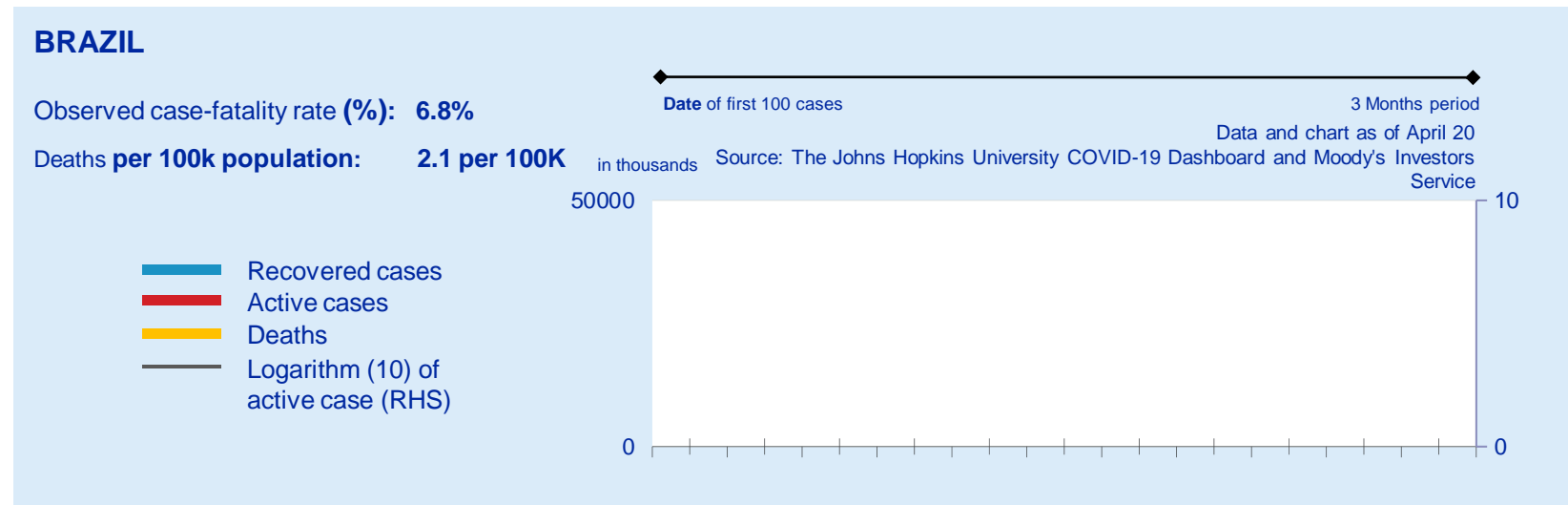
0.2 per 100K



BRAZIL—COVID-19

As of April 23, 2020

- » **CURRENT SITUATION** Brazilian authorities reported nearly 49,492 cases and 3,310 deaths in Brazil as of April 23. Most of the cases, including the number of casualties, were from the state of Sao Paulo. Most regional governments have implemented mitigation measures, including school closures, restrictions to public gatherings and to non-essential services. Foreigners' entry through airports is now restricted and borders are closed except for freight, Brazilians and foreign residents, and professionals from international organizations.



BRAZIL—Policy responses to COVID-19

Key Policy Responses as of April 23, 2020

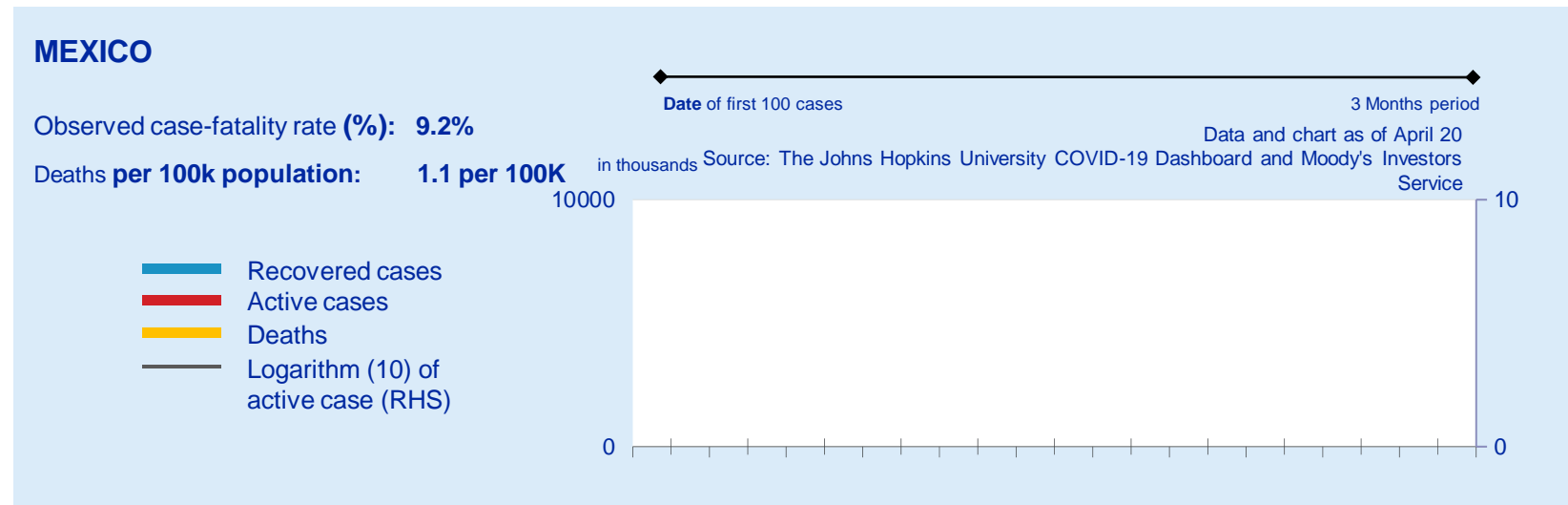
- » **FISCAL POLICY** To mitigate the impact of COVID-19, the authorities announced a series of fiscal measures adding up to **6½ percent of GDP**. The fiscal measures include temporary income support to vulnerable households (bringing forward the 13th pension payment to retirees, expanding the Bolsa Familia program with the inclusion of over 1 million more beneficiaries, cash transfers to informal and unemployed workers, and advance payments of salary bonuses to low income workers), employment support (partial compensation to workers which are temporarily suspended or have a cut in working hours, as well as temporary tax breaks and credit lines for firms that preserve employment), lower taxes and import levies on essential medical supplies, and new transfers from the federal to state governments to support higher health spending and as cushion against the expected fall in revenues. Financial assistance states and municipalities – with new transfers to compensate for revenue falls, a temporary stay of debt payments, debt renegotiation, and support for credit operations through government guarantees – was also announced. Public banks are expanding credit lines for businesses and households, with a focus on supporting working capital (credit lines add up to over **3 percent of GDP**), and the government will back a **½ percent of GDP credit line** to cover payroll costs.
- » **MONETARY AND MACRO-FINANCIAL** The central bank lowered the policy rate (SELIC) by 50bps a historical low of 3.75 percent. The reserve requirement has been reduced from 25 to 17, on top of a reduction of 6 bps in early March. The Fed has arranged to provide up to US\$60 billion to the central bank through a swap facility that will remain in place for the next six months. The five largest banks in the country agreed to consider requests by individuals and SMEs for a 60-day extension of their maturing debt liabilities.

Source: IMF COVID 19 Policy Tracker <https://www.imf.org/en/Topics/imf-and-covid19/Policy-Responses-to-COVID-19>

MEXICO—COVID-19

As of April 23, 2020

- » **CURRENT SITUATION** The Mexican authorities have reported 10,544 confirmed cases and 970 deaths as of April 22, 2020. To delay the spread of the coronavirus, the government has declared a health emergency and is implementing a range of measures, including travel restrictions, social distancing, closure of schools and shutdown of non-essential activities. On April 5, President Lopez Obrador outlined his government's policy priorities to combat the economic effects of COVID-19, including more health spending and strengthening of the social safety net. Mexico was also hit by the global selloff in financial markets and the declining oil price—since February 20, local government bond markets saw nonresident outflows of around US\$ 8 billion (0.7 percent of 2019 GDP), the 10-year dollar credit spread widened from 132 bps to 367 bps for the sovereign and from 377 bps to 1041 bps for Pemex, and the peso depreciated by 22 percent relative to the US\$ (as of April 16, 2020).



MEXICO—Policy responses to COVID-19

Key Policy Responses as of April 23, 2020

- » **FISCAL POLICY** The government announced that it would: 1) ensure that the Ministry of Health has sufficient resources and does not face red-tape, and sufficient supply of medical equipment and materials; 2) advance pension payments to the elderly; 3) accelerate the tender processes for public spending to ensure full budget execution; and 4) consider setting-up a Health Emergency Fund to request additional resources from Congress, that could reach up to 180 billion pesos (**0.7 percent of 2019 GDP**). President AMLO addressed the nation on April 5 outlining the government's priorities. Besides higher health spending and strengthening of the social safety net, the plan includes measures like: 1) frontloading of social pension and disability payments by four months; 2) accelerating procurement processes and VAT refunds; 3) lending up to 25 billion pesos to SMEs; 4) liquidity support by development banks; 5) some workers accessing loans against their social security accounts. In addition, the government announced 1) public housing credit institute covering three months of workers' debt (defer further six months for those let go); 2) lending of 25 billion pesos for small businesses who has not fired workers or reduced salaries since the outbreak. The week of April 19 the President further announced an austerity program for public expenditures including wage reductions and a hiring in order to free up **2½ percent of GDP** to finance additional health expenditures and priority investment.

Source: IMF COVID 19 Policy Tracker <https://www.imf.org/en/Topics/imf-and-covid19/Policy-Responses-to-COVID-19>

MEXICO—Policy responses to COVID-19

Key Policy Responses as of April 23, 2020

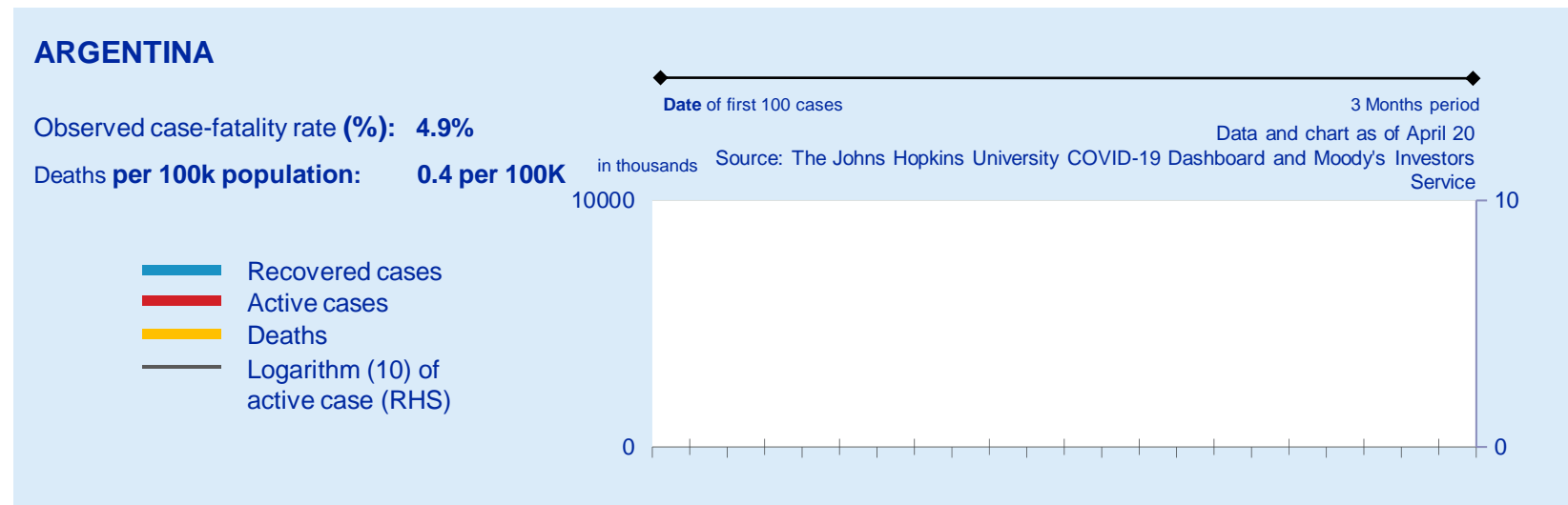
- » **MONETARY AND MACRO-FINANCIAL** Monetary policy rate has been lowered by 100bp to 6 percent, most recently in a 50bp cut this week. The non-deliverable forward hedging program (NDF, in domestic currency) was extended by \$10 billion to \$30 billion ; two NDF auctions were conducted offering \$2 billion each (allocated \$2 billion total, 0.2 percent of 2019 GDP). Conducted several government bond exchanges, mainly to shorten maturities; and revised plans for new government bond issuance. Announced additional measures to provide MXN and USD liquidity to the banking system and improve the functioning of the domestic financial markets: 1) reduce the mandatory regulatory deposit with Banxico (by 50 billion pesos, or about 15 percent of the current stock); 2) halved the cost of repos; 3) provide USD liquidity (via auctions) to banks by drawing on the \$60 billion swap line with the Fed ; and 4) in conjunction with the Ministry of Finance, seek to strengthen market making in the government bond market. Activated the swap line with the Fed, auctioned already US\$ 5 billion to commercial banks and announced a second auction (US\$ 5 billion) . Temporarily adjusted the accounting rules for banks and other financial institutions to facilitate debt service rescheduling ; recommended suspension of dividend payments and share buybacks . The central bank has also substantially expanded its liquidity facilities making them more affordable, accepting a broader range of collateral and expanding eligible institutions while establishing a corporate securities repo facility to support the corporate bond market.

Source: IMF COVID 19 Policy Tracker <https://www.imf.org/en/Topics/imf-and-covid19/Policy-Responses-to-COVID-19>

ARGENTINA—COVID-19

As of April 23, 2020

- » **CURRENT SITUATION** The outbreak of COVID-19 in Argentina has been relatively limited so far, with 3,435 confirmed cases and 165 mortalities (as of April 23), and the majority of the cases centered in the Province and City of Buenos Aires. The authorities have adopted sweeping measures to prevent a rapid growth in infections, involving a full closure of borders and a nationwide quarantine, beginning on March 20th and lasting until at least May 4th, including closed borders. Capital Flow Management Measures (CFMs) that were already in place since August 2019 have largely protected Argentina so far from the impact of capital outflows.



ARGENTINA—Policy responses to COVID-19

Key Policy Responses as of April 23, 2020

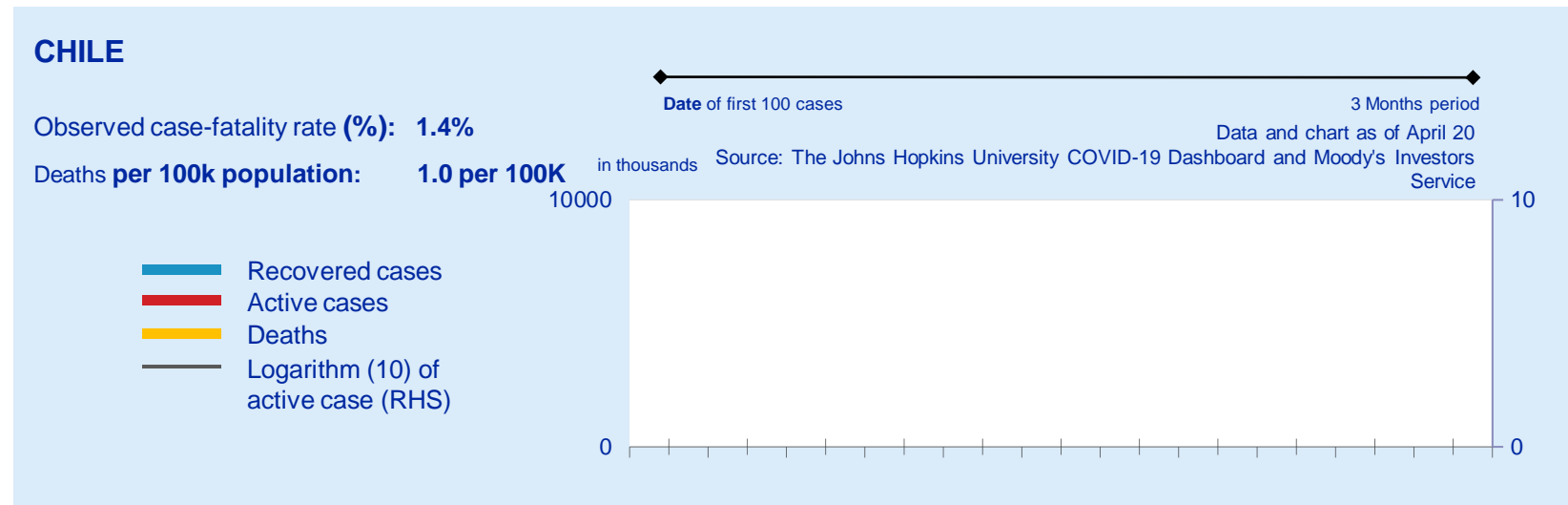
- » **FISCAL POLICY** Adopted measures (totaling about **3.0 percent of GDP**, 1.2 percent in the budget and 1.8 percent off-budget, based on authorities' estimates) have focused on providing: (i) increased health spending, including for improvements in virus diagnostics, purchases of hospital equipment and construction of clinics and hospitals; (ii) support for workers and vulnerable groups, including through increased transfers to poor families, social security benefits (especially to low-income beneficiaries), unemployment insurance benefits, and payments to minimum-wage workers; (iii) support for hard-hit sectors, including an exemption from social security contributions, grants to cover payroll costs; and subsidized loans for construction-related activities; (iv) demand support, including spending on public works; (v) forbearance, including continued provision of utility services for households in arrears; and (vi) credit guarantees for bank lending to micro, small and medium enterprises (SMEs) for the production of foods and basic supplies. In addition, the authorities have adopted anti-price gouging policies, including price controls for food and medical supplies and ringfencing of essential supplies, including certain export restrictions on medical supplies and equipment and centralization of the sale of essential medical supplies.
- » **MONETARY AND MACRO-FINANCIAL** Measures have been aimed at encouraging bank lending through (i) lower reserve requirements on bank lending to households and SMEs; (ii) regulations that limit banks' holdings of central bank paper to provide space for SME lending; (iii) temporary easing of bank provisioning needs and of bank loan classification rules (i.e. extra 60 days to be classified as non-performing); and (iv) a stay on both bank account closures due to bounced checks and credit denial to companies with payroll tax arrears.

Source: IMF COVID 19 Policy Tracker <https://www.imf.org/en/Topics/imf-and-covid19/Policy-Responses-to-COVID-19>

CHILE—COVID-19

As of April 30, 2020

- » **CURRENT SITUATION** Chile has reported 16,023 confirmed COVID-19 cases and 227 deaths as of April 29, 2020. In response to COVID-19, the authorities have implemented a range of measures, including declaration of state of catastrophe, travel restrictions, closure of schools, curfews and bans on public gatherings, and a Law on teleworking. The authorities have also unveiled measures to support employment and incomes, and provide liquidity, elaborated below. The COVID-19 outbreak comes only a few months after the social unrest that started in mid-October 2019.



CHILE—Policy responses to COVID-19

Key Policy Responses as of April 30, 2020

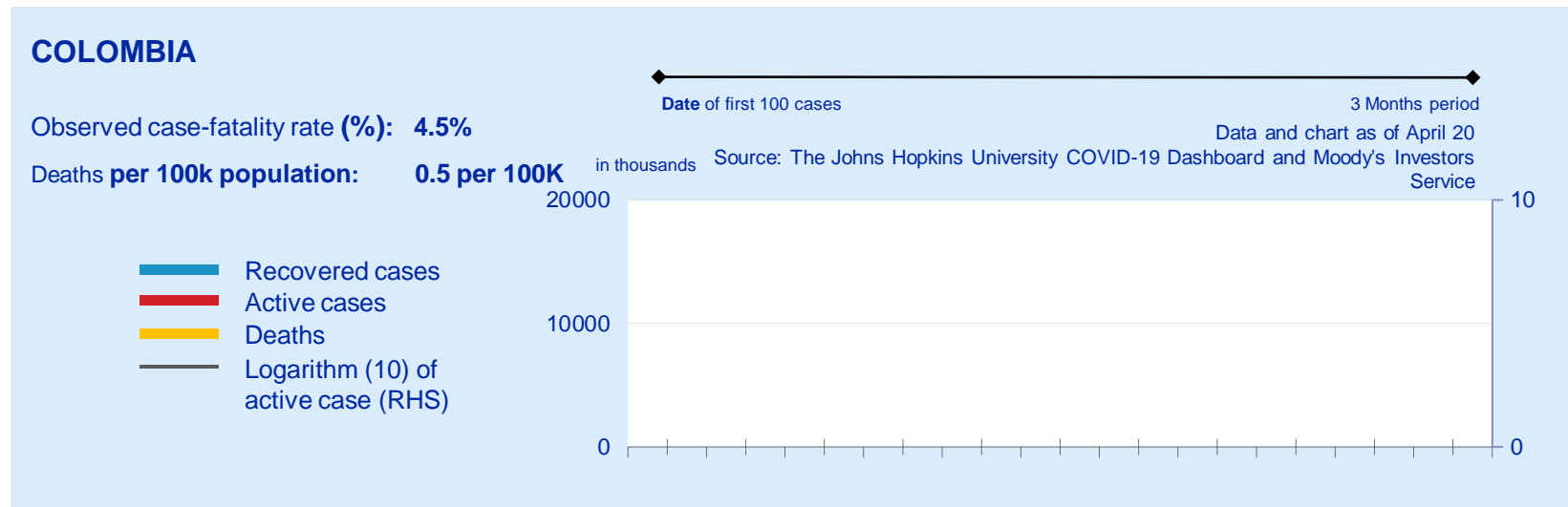
- » **FISCAL POLICY** On March 19, the authorities presented a package of fiscal measures of up to US\$11.75 billion (about **4.7 percent of GDP**) focused on supporting employment and firms' liquidity. The set of measures includes: (i) higher healthcare spending; (ii) enhanced subsidies and unemployment benefits; (iii) a set of tax deferrals; (iv) liquidity provision to SMEs, including through the state-owned Banco del Estado; and (v) accelerated disbursements for public procurement contracts. On April 8, the authorities announced: (i) additional support for the most vulnerable and independent workers of about US\$2 billion; and (ii) a credit-guarantee scheme (of US\$3 billion) that could apply to credits of up to US\$24 billion for facilitate firms' financing.
- » **MONETARY AND MACRO-FINANCIAL** The key measures undertaken by the Central Bank of Chile include: (i) two policy rate cuts by cumulative 125 basis points to 0.5 percent; (ii) introduction of a new funding facility for banks conditional on them increasing credit; (iii) inclusion of corporate securities as collateral for the Central Bank's liquidity operations and inclusion of high-rated commercial loans as collateral for the funding facility operations; (iv) initiation of a program for purchase of bank bonds (up to US\$8 billion); (v) expansion of eligible currencies for meeting reserve requirements in foreign currencies; (vi) flexibilization of Central Bank regulations for bank liquidity; and (vii) expansion of the program for providing liquidity in pesos and US\$ through repo operations and swaps. The Financial Market Commission unveiled a package of measures to facilitate the flow of credit to businesses and households, which includes: (i) special treatment in the establishment of provisions for deferred loans; (ii) use of mortgage guarantees to safeguard SME loans; (iii) adjustments in the treatment of assets received as payment and margins in derivative transactions; and (iv) revision of the timetable for the implementation of Basel III standards.

Source: IMF COVID 19 Policy Tracker <https://www.imf.org/en/Topics/imf-and-covid19/Policy-Responses-to-COVID-19>

COLOMBIA—COVID-19

As of April 30, 2020

- » **CURRENT SITUATION** Colombia has 6,211 confirmed COVID-19 cases and 278 deaths as of April 30, 2020. The government declared a state of emergency on March 17, and a quarantine has been in place since March 25. The construction and manufacturing sectors were allowed to restart operations on April 27. Other measures to contain virus transmission have included travel bans, border closures, and a suspension of classes. The government has also announced economic measures as part of the response.



COLOMBIA—Policy responses to COVID-19

Key Policy Responses as of April 30, 2020

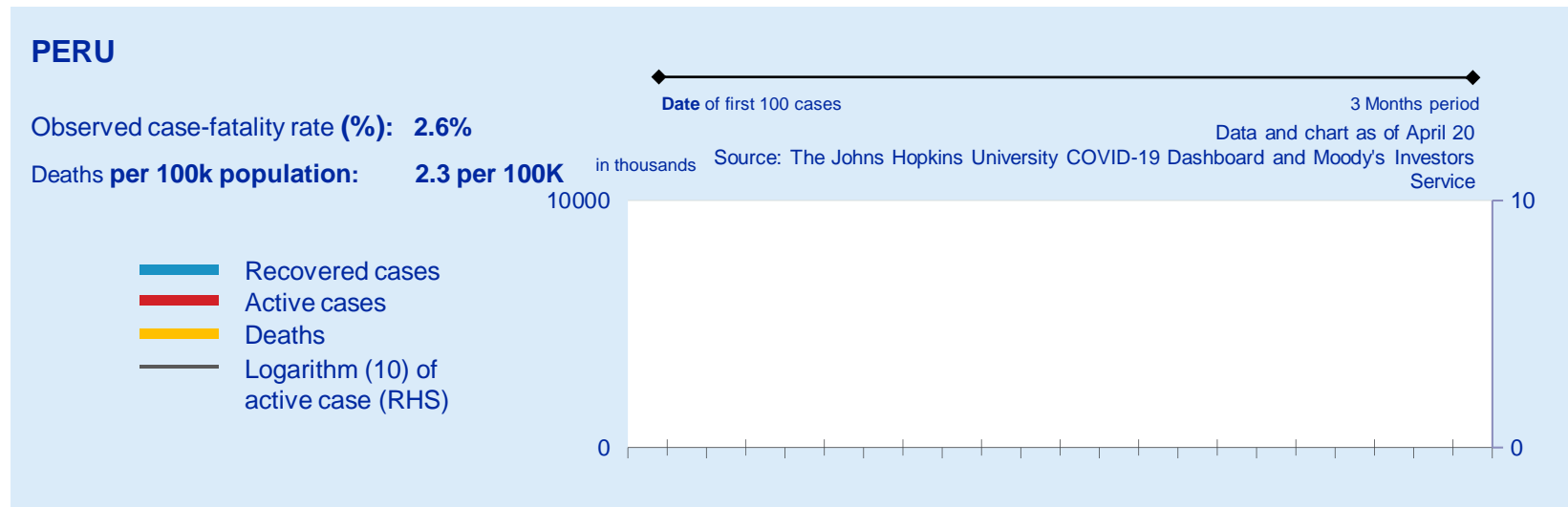
- » **FISCAL POLICY** A state of emergency decree created a National Emergency Mitigation Fund, which will be partially funded from regional and stabilization funds (around **1.5 percent of GDP**) and will be complemented by **1.3 percent of GDP** from domestic bond issuance and other budgetary resources. Additional budgetary support for health has been announced, along with faster direct contracting for services associated with the emergency response, new credit lines providing liquidity support to the coffee sector and all tourism-related companies, new credit lines for payroll and loan payments for SMES through the National Guarantee Fund, a two-month suspension of pension contributions by both employees and employers, delayed tax collection for the tourism and air transportation sectors, an exemption of tariffs and VAT for strategic health imports and selected food industries and services, delayed utility payments for poor and middle income households, additional taxes for public sector workers (to help fund the response), and expanded transfers for vulnerable group
- » **MONETARY AND MACRO-FINANCIAL** The Central Bank has cut the policy rate by 100 bp and has implemented several measures to boost liquidity in both the financial market and foreign exchange rate markets. These include: (i) an extension of access of their liquidity overnight and term facilities to managed funds, stock brokerage companies, trusts, and investment companies, (ii) an expansion of their liquidity operations (REPOS) allotment, (iii) a COP 10 trillion program to purchase securities issued by credit institutions, and (iv) TES purchases in the secondary market. The Central Bank also lowered the reserve requirement applicable to savings and checking accounts from 11 to 8 percent and the one applicable to fixed-term savings accounts (less than 18 months) from 4.5 to 3.5 percent.

Source: IMF COVID 19 Policy Tracker <https://www.imf.org/en/Topics/imf-and-covid19/Policy-Responses-to-COVID-19>

PERU—COVID-19

As of April 29, 2020

- » **CURRENT SITUATION** The first case of COVID-19 was confirmed in Peru on March 6th and by April 29th there were 39,931 confirmed cases and 943 deaths. The government has declared a state of national emergency and implemented a number of measures to limit the spread of the virus, including closing of national borders, restrictions to interprovincial movement, a mandatory two-week national isolation period (extended three additional times until May 10th), and daily curfews from 6 pm to 4 am. In addition to the distortions associated with the domestic outbreak, the decline in copper (and other commodity) prices is reducing the country's external and fiscal revenues.



PERU—Policy responses to COVID-19

Key Policy Responses as of April 29, 2020

- » **FISCAL POLICY** The government has approved 1.1 billion soles (**0.14 percent of GDP**) to attend the health emergency. In addition, the government has approved approximately 3.4 billion soles (**0.4 percent of GDP**) in direct transfers to support poor households during the four-week national isolation period and it is likely to increase this amount given the extension of this period. The government has approved a three-month extension for the income tax declaration for SMEs and is granting flexibility to enterprises and households in the repayment of tax liabilities. These tax measures are estimated to provide a temporary relief in the order of **1.4 percent of GDP**. The government has also approved the creation of a 300 million soles (or **0.04 percent of GDP**) fund to help qualified SMEs to secure working capital and/or refinance debts. The government has announced a postponement of households' payments of electricity and water. The government has recently announced a bigger fiscal support package which would take total fiscal support to **over 7 percent of GDP**.
- » **MONETARY AND MACRO-FINANCIAL** The central bank has cut the policy rate by 200 basis points, bringing it to ¼ percent, and is monitoring inflation developments and its determinants in order to increase the monetary stimulus if necessary. In addition, the central bank has reduced reserve requirements, provided liquidity to the financial system through repo operations, and has recently announced a package of 30 billion soles (nearly 4 percent of GDP) in liquidity assistance (backed by government guarantees) to support lending and the payments chain. The superintendence of banks has issued a notification allowing financial institutions to modify the terms of their loans to households and enterprises affected by the Covid-19 outbreak without changing the classification of the loans. These operations have to satisfy well defined conditions, including a maximum modification period of six months.

Source: IMF COVID 19 Policy Tracker <https://www.imf.org/en/Topics/imf-and-covid19/Policy-Responses-to-COVID-19>

A nighttime cityscape featuring a dense cluster of illuminated skyscrapers and a complex multi-level highway interchange in the foreground. The scene is lit with a mix of warm yellow and cool blue tones, creating a vibrant urban atmosphere.

MOODY'S
INVESTORS SERVICE

Access is everything™

Richard Cantor

Chief Credit Officer

Richard.Cantor@moody's.com

+1 (212) 553-3620

moody's.com

This publication does not announce a credit rating action. For any credit ratings referenced in this publication, please see the ratings tab on the issuer/entity page on www.moodys.com for the most updated credit rating action information and rating history.

© 2020 Moody's Corporation, Moody's Investors Service, Inc., Moody's Analytics, Inc. and/or their licensors and affiliates (collectively, "MOODY'S"). All rights reserved.

CREDIT RATINGS ISSUED BY MOODY'S INVESTORS SERVICE, INC. AND ITS RATINGS AFFILIATES ("MIS") ARE MOODY'S CURRENT OPINIONS OF THE RELATIVE FUTURE CREDIT RISK OF ENTITIES, CREDIT COMMITMENTS, OR DEBT OR DEBT-LIKE SECURITIES, AND MOODY'S PUBLICATIONS MAY INCLUDE MOODY'S CURRENT OPINIONS OF THE RELATIVE FUTURE CREDIT RISK OF ENTITIES, CREDIT COMMITMENTS, OR DEBT OR DEBT-LIKE SECURITIES. MOODY'S DEFINES CREDIT RISK AS THE RISK THAT AN ENTITY MAY NOT MEET ITS CONTRACTUAL, FINANCIAL OBLIGATIONS AS THEY COME DUE AND ANY ESTIMATED FINANCIAL LOSS IN THE EVENT OF DEFAULT. CREDIT RATINGS DO NOT ADDRESS ANY OTHER RISK, INCLUDING BUT NOT LIMITED TO: LIQUIDITY RISK, MARKET VALUE RISK, OR PRICE VOLATILITY. CREDIT RATINGS AND MOODY'S OPINIONS INCLUDED IN MOODY'S PUBLICATIONS ARE NOT STATEMENTS OF CURRENT OR HISTORICAL FACT. MOODY'S PUBLICATIONS MAY ALSO INCLUDE QUANTITATIVE MODEL-BASED ESTIMATES OF CREDIT RISK AND RELATED OPINIONS OR COMMENTARY PUBLISHED BY MOODY'S ANALYTICS, INC. CREDIT RATINGS AND MOODY'S PUBLICATIONS DO NOT CONSTITUTE OR PROVIDE INVESTMENT OR FINANCIAL ADVICE, AND CREDIT RATINGS AND MOODY'S PUBLICATIONS ARE NOT AND DO NOT PROVIDE RECOMMENDATIONS TO PURCHASE, SELL, OR HOLD PARTICULAR SECURITIES. NEITHER CREDIT RATINGS NOR MOODY'S PUBLICATIONS COMMENT ON THE SUITABILITY OF AN INVESTMENT FOR ANY PARTICULAR INVESTOR. MOODY'S ISSUES ITS CREDIT RATINGS AND PUBLISHES MOODY'S PUBLICATIONS WITH THE EXPECTATION AND UNDERSTANDING THAT EACH INVESTOR WILL, WITH DUE CARE, MAKE ITS OWN STUDY AND EVALUATION OF EACH SECURITY THAT IS UNDER CONSIDERATION FOR PURCHASE, HOLDING, OR SALE.

MOODY'S CREDIT RATINGS AND MOODY'S PUBLICATIONS ARE NOT INTENDED FOR USE BY RETAIL INVESTORS AND IT WOULD BE RECKLESS AND INAPPROPRIATE FOR RETAIL INVESTORS TO USE MOODY'S CREDIT RATINGS OR MOODY'S PUBLICATIONS WHEN MAKING AN INVESTMENT DECISION. IF IN DOUBT YOU SHOULD CONTACT YOUR FINANCIAL OR OTHER PROFESSIONAL ADVISER.

ALL INFORMATION CONTAINED HEREIN IS PROTECTED BY LAW, INCLUDING BUT NOT LIMITED TO, COPYRIGHT LAW, AND NONE OF SUCH INFORMATION MAY BE COPIED OR OTHERWISE REPRODUCED, REPACKAGED, FURTHER TRANSMITTED, TRANSFERRED, DISSEMINATED, REDISTRIBUTED OR RESOLD, OR STORED FOR SUBSEQUENT USE FOR ANY SUCH PURPOSE, IN WHOLE OR IN PART, IN ANY FORM OR MANNER OR BY ANY MEANS WHATSOEVER, BY ANY PERSON WITHOUT MOODY'S PRIOR WRITTEN CONSENT.

CREDIT RATINGS AND MOODY'S PUBLICATIONS ARE NOT INTENDED FOR USE BY ANY PERSON AS A BENCHMARK AS THAT TERM IS DEFINED FOR REGULATORY PURPOSES AND MUST NOT BE USED IN ANY WAY THAT COULD RESULT IN THEM BEING CONSIDERED A BENCHMARK.

All information contained herein is obtained by MOODY'S from sources believed by it to be accurate and reliable. Because of the possibility of human or mechanical error as well as other factors, however, all information contained herein is provided "AS IS" without warranty of any kind. MOODY'S adopts all necessary measures so that the information it uses in assigning a credit rating is of sufficient quality and from sources MOODY'S considers to be reliable including, when appropriate, independent third-party sources. However, MOODY'S is not an auditor and cannot in every instance independently verify or validate information received in the rating process or in preparing the Moody's publications.

To the extent permitted by law, MOODY'S and its directors, officers, employees, agents, representatives, licensors and suppliers disclaim liability to any person or entity for any indirect, special, consequential, or incidental losses or damages whatsoever arising from or in connection with the information contained herein or the use of or inability to use any such information, even if MOODY'S or any of its directors, officers, employees, agents, representatives, licensors or suppliers is advised in advance of the possibility of such losses or damages, including but not limited to: (a) any loss of present or prospective profits or (b) any loss or damage arising where the relevant financial instrument is not the subject of a particular credit rating assigned by MOODY'S.

To the extent permitted by law, MOODY'S and its directors, officers, employees, agents, representatives, licensors and suppliers disclaim liability for any direct or compensatory losses or damages caused to any person or entity, including but not limited to by any negligence (but excluding fraud, willful misconduct or any other type of liability that, for the avoidance of doubt, by law cannot be excluded) on the part of, or any contingency within or beyond the control of, MOODY'S or any of its directors, officers, employees, agents, representatives, licensors or suppliers, arising from or in connection with the information contained herein or the use of or inability to use any such information.

NO WARRANTY, EXPRESS OR IMPLIED, AS TO THE ACCURACY, TIMELINESS, COMPLETENESS, MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE OF ANY SUCH RATING OR OTHER OPINION OR INFORMATION IS GIVEN OR MADE BY MOODY'S IN ANY FORM OR MANNER WHATSOEVER.

Moody's Investors Service, Inc., a wholly-owned credit rating agency subsidiary of Moody's Corporation ("MCO"), hereby discloses that most issuers of debt securities (including corporate and municipal bonds, debentures, notes and commercial paper) and preferred stock rated by Moody's Investors Service, Inc. have, prior to assignment of any rating, agreed to pay to Moody's Investors Service, Inc. for appraisal and rating services rendered by it fees ranging from \$1,500 to approximately \$2,500,000. MCO and MIS also maintain policies and procedures to address the independence of MIS's ratings and rating processes. Information regarding certain affiliations that may exist between directors of MCO and rated entities, and between entities who hold ratings from MIS and have also publicly reported to the SEC an ownership interest in MCO of more than 5%, is posted annually at www.moodys.com under the heading "Investor Relations — Corporate Governance — Director and Shareholder Affiliation Policy."