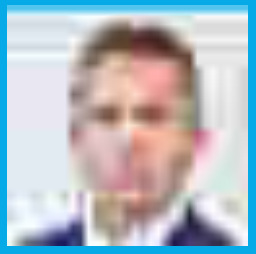
Deutsche Bank

Life After COVID

The Gradual Path to Restoring Public Health, Markets & the Economy

April 2020

Authors



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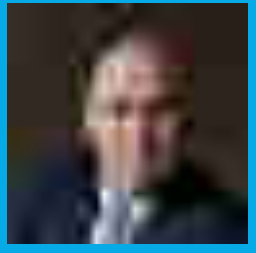

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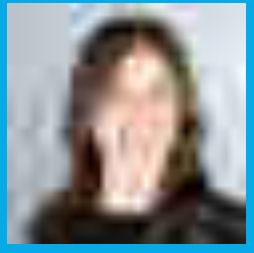

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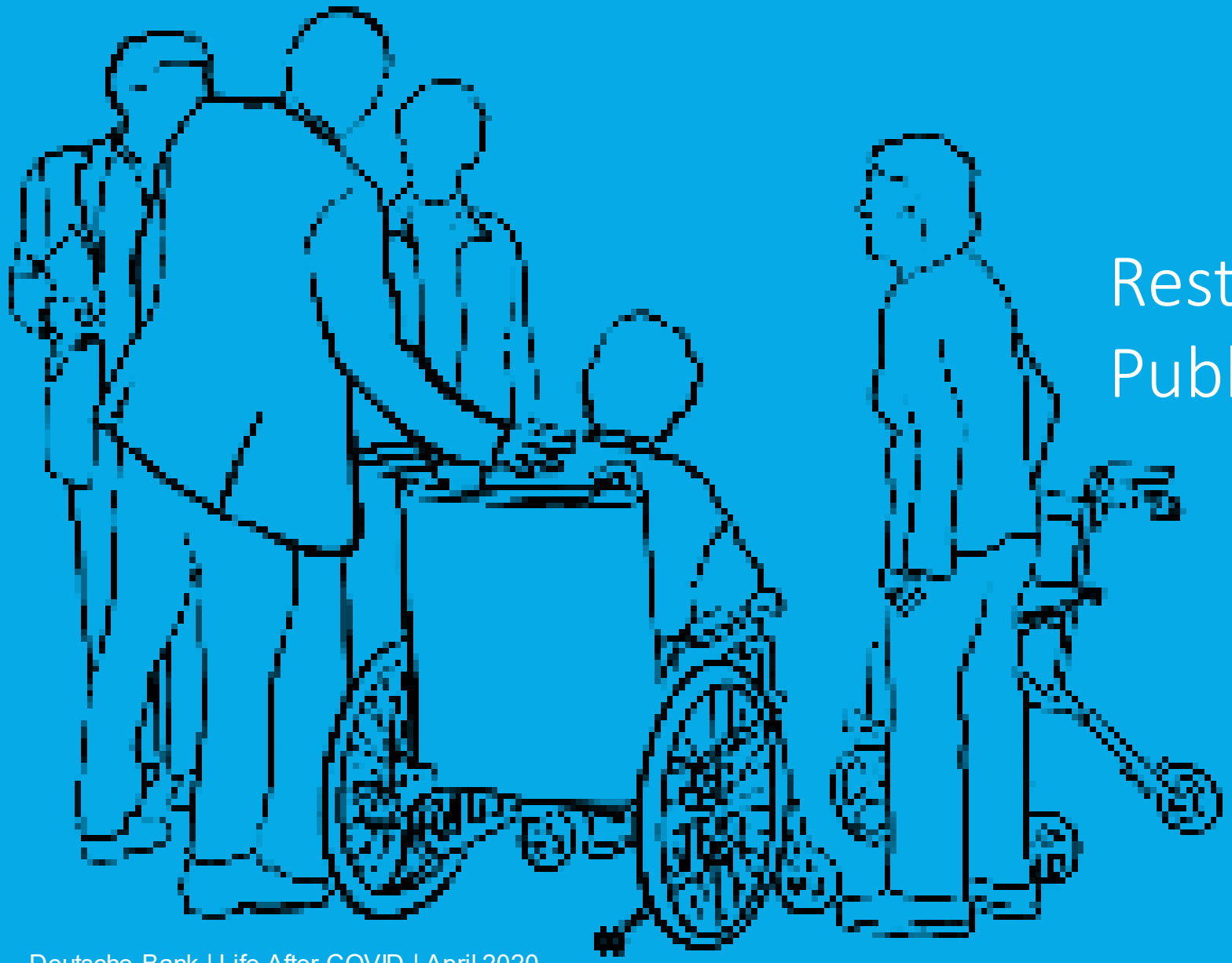
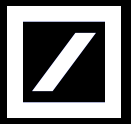


Restoring Public Health

A.



"What's true of all the evils in the world is true of plague as well. It helps men to rise above themselves."

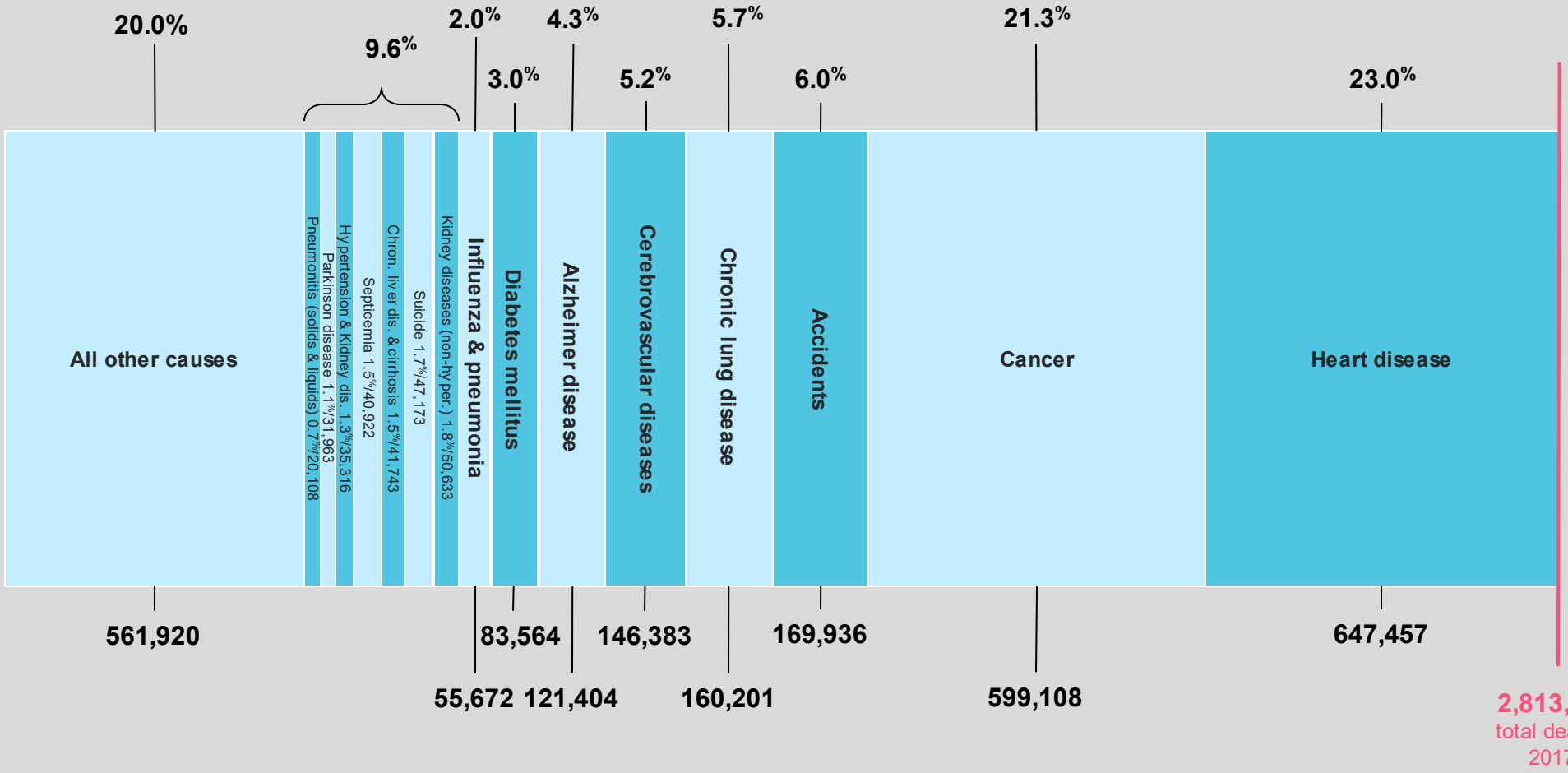
Albert Camus, French-Algerian philosopher and Nobel Prize-winning author (1913-1960)

Restoring Public Health

- Transmission: Once in a Century
- Suppression: Virus Response Matters Most
- Lockdown: Unprecedented
- Exit Risk: Resurgence & Return
- Co-Existence: Testing & Tracing Infrastructure

Causes of Death in the United States

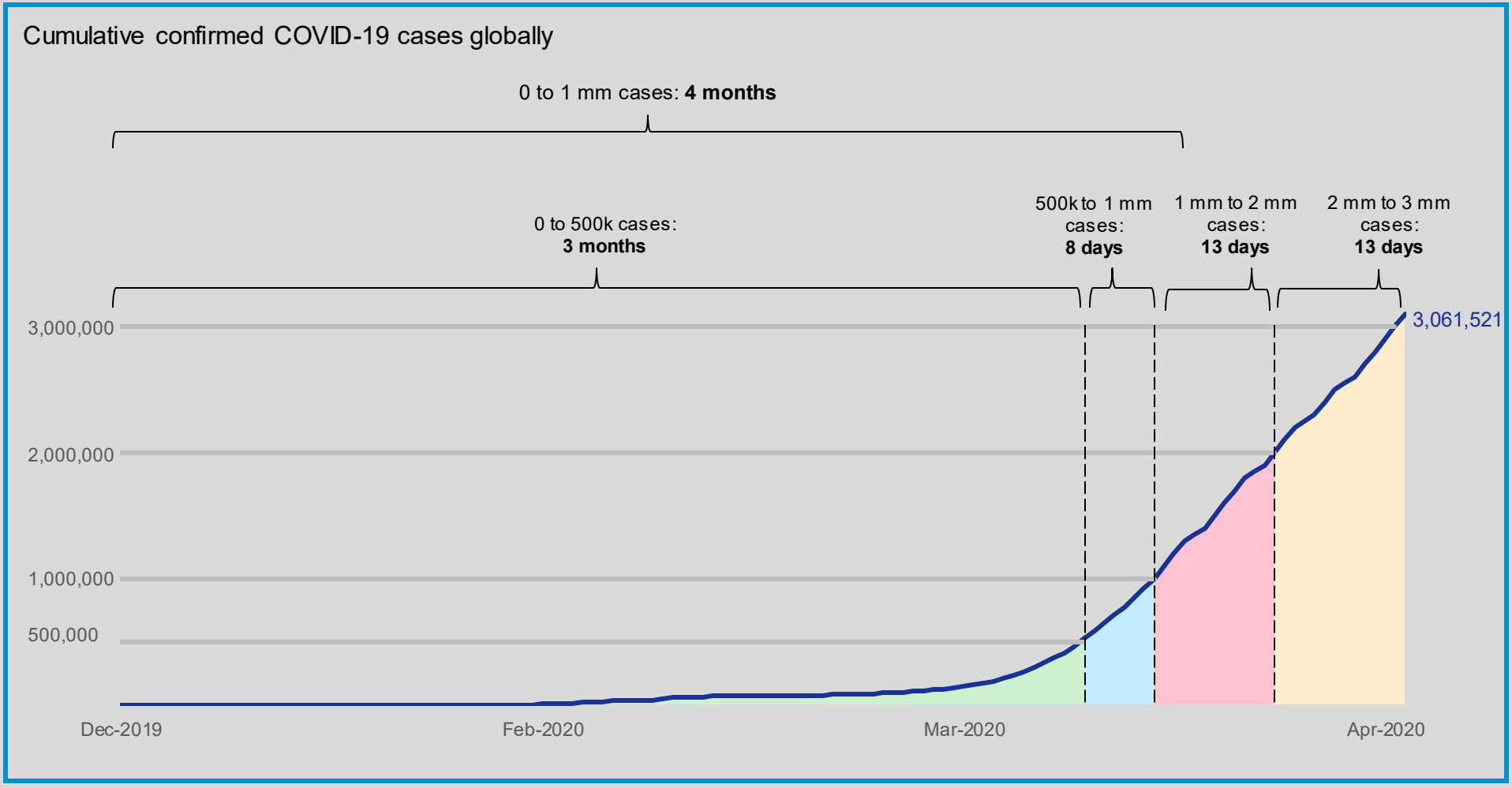
With a projected 75-100k deaths expected, COVID-19 is not likely to become a top 5 driver of US mortalities in 2020. However, in the absence of strict social distancing measures, it is the uniquely high transmission and hospitalization rates of COVID-19 that pose the greatest threats to public health, the economy and markets.



Source: CDC, World Bank, U.S. Census, Imperial College London, POLITICO staff reports. *Latest data available

Once in a Century Transmission

COVID-19 has now spread to more than 3 million people in over 180 countries and all 50 US states, a rate of infection that has not been seen in more than a century. While it took 3 months for the virus to spread to 500 thousand people globally, it only took 8 days for cases to double to 1 million and another 13 days to reach 2 and 3 million, respectively.



Source: (1) Johns Hopkins Coronavirus COVID-19 Global Cases Tracker. Data as of April 28, 2020.

The Importance of Virus Suppression

From the narrow lens of economic analysis, the true impact of COVID-19 comes from its extraordinarily high transmission, the highest in a century, even among young people. In our view, virus suppression and the restoration of public health therefore becomes aligned with favorable economic outcomes. While we need to re-open the economy, and learn to coexist with the virus, it is our view that simply "ring-fencing the elderly" and going "back to work" without "virus suppression" will lead to unfavorable economic outcomes.

1. COVID-19 has the highest transmission rate of any virus in over a century (180 countries in 3 months).
2. Much higher hospitalization and ICU rates than seasonal flu, including for younger adults.
3. Without social distancing, COVID-19 transmission can completely debilitate major healthcare and hospital systems within weeks.
4. Regardless of Government re-open dates, people will sharply limit discretionary activity and spending until they feel "safe" (consumer is 70% of US GDP, and >50% of that spending is discretionary).
5. Viruses are not stagnant, but mutate, and sometimes strengthen, as they adapt to the human condition (i.e., 1918 experience).
6. High transmission in Northern Hemisphere, increases transmission to Southern Hemisphere now entering their winter, which then increases probability of return back to the North in the Fall.
7. "Back to work" during high transmission creates formidable litigation, insurance and employee management challenges for public and private institutions.
8. High percentage of US and global population live in urban-suburban settings.

Most Impacted Countries

The US has just over 6x South Korea's population, but its peak new daily confirmed case count was more than 40x higher (36,000 vs 850). While the US accounts for 4% of the global population, it accounts for over 25% of global COVID fatalities.

Top 20 countries on confirmed cases per 1 million people		
1.	Luxembourg	6,136
2.	Spain	4,968
3.	Qatar	4,286
4.	Belgium	4,144
5.	Ireland	4,048
6.	Switzerland	3,436
7.	Italy	3,300
8.	United States	3,091
9.	Singapore	2,652
10.	France	2,476
11.	Portugal	2,366
12.	United Kingdom	2,364
13.	Netherlands	2,230
14.	Sweden	1,927
15.	Germany	1,915
16.	Bahrain	1,790
17.	Israel	1,755
18.	Austria	1,736
19.	Denmark	1,527
20.	Panama	1,442

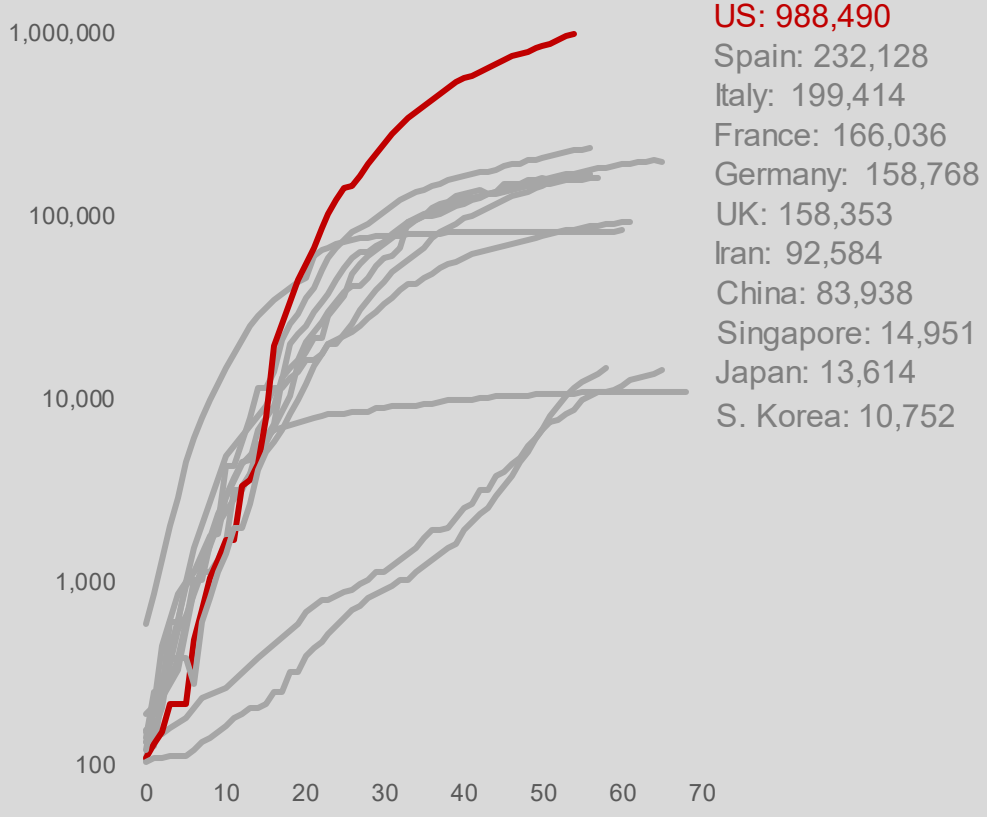
Top 20 countries on confirmed deaths per 1 million people		
1.	Belgium	642
2.	Spain	510
3.	Italy	446
4.	France	348
5.	United Kingdom	317
6.	Netherlands	265
7.	Sweden	231
8.	Ireland	227
9.	Switzerland	197
10.	United States	174
11.	Luxembourg	145
12.	Portugal	92
13.	Denmark	75
14.	Germany	74
15.	Canada	73
16.	Iran	72
17.	Austria	64
18.	Slovenia	42
19.	Panama	40
20.	Ecuador	39

Source: (1-2) RealClearPolitics. Coronavirus global deaths. Data as of April 28, 2020.

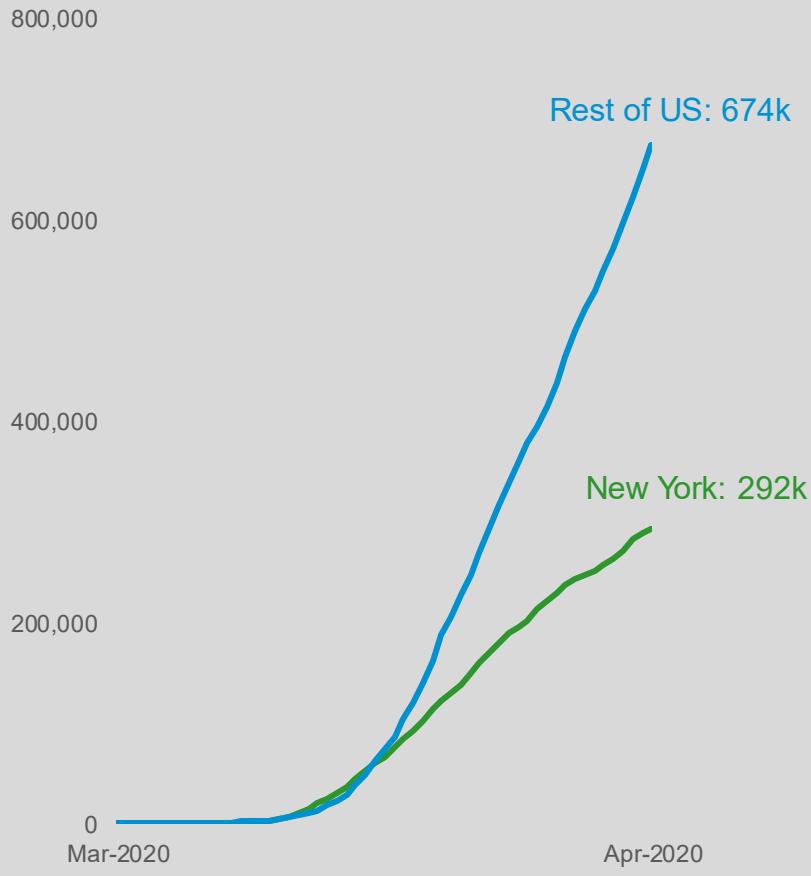
Flattening, then Bending, the Curve

While the US has made much progress on "flattening" the curve, our more relaxed version of social distancing makes the effort of "bending" the curve closer to zero a slower process

Growth in total cases over 70 days following 100 confirmed cases



Cumulative confirmed COVID-19 cases

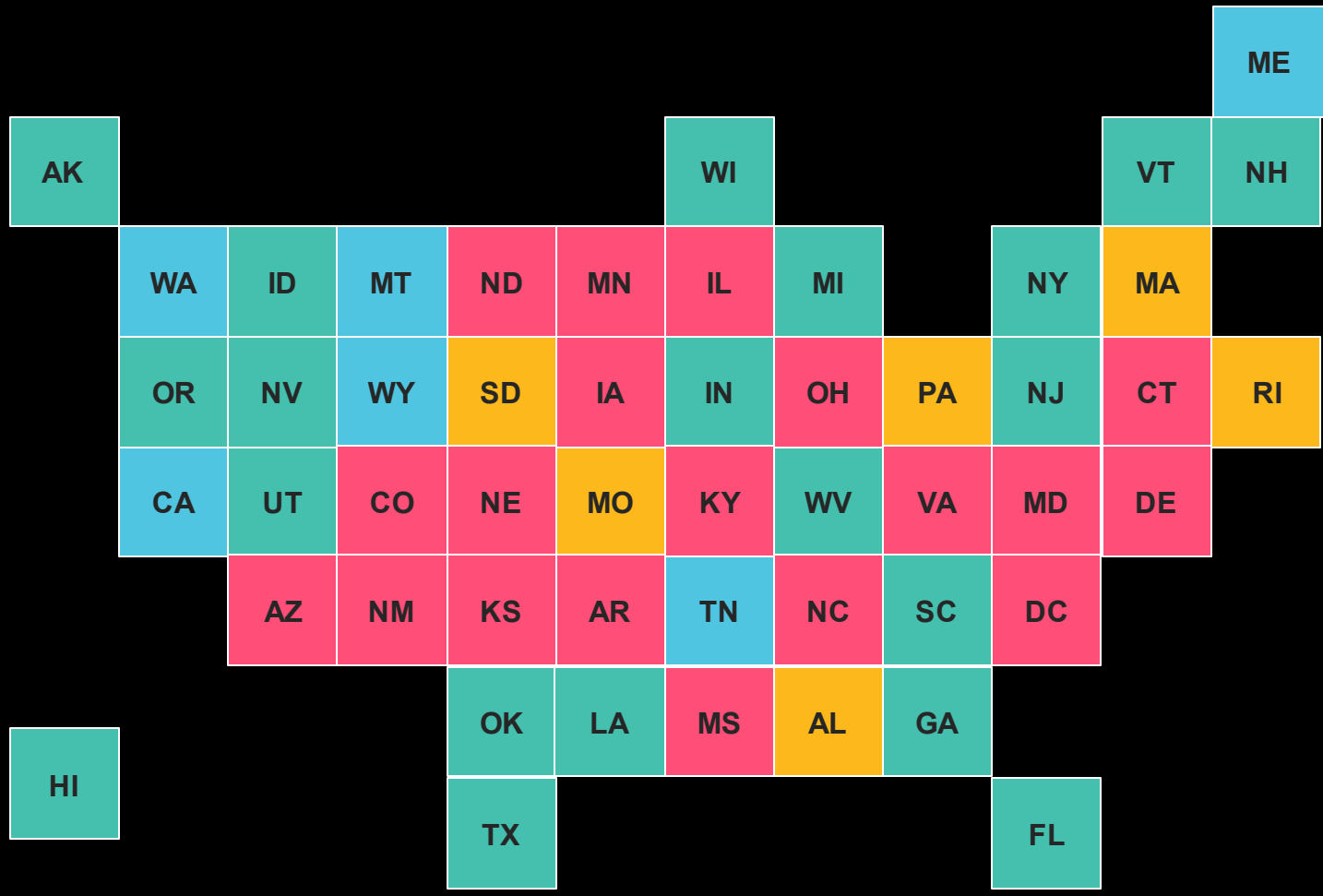


Source: (1-2) Johns Hopkins Coronavirus COVID-19 Global Cases Tracker. Data as of April 28, 2020. Chart shows only first 70 days after first day of over 100 reported cases, end label is data as of April 28, 2020. Axis is on logarithmic scale.

Where the Coronavirus Has Peaked?

States where the estimated percentage of positive COVID-19 tests:

- Met or Tied a New High, April 15-22
- Peaked, April 9-15
- Peaked, April 2-8
- Peaked, March 25 - April 1



Source: fivethirtyeight.com, "Coronavirus Cases Are Still Grow ing In Many U.S. States"

Where the Coronavirus May Not Have Peaked?

While numerous US states are past peak transmission (i.e., NY, CA), rising positive test results suggest that nearly half of all US states (representing over 150 million people) are still at or near peak transmission levels. This has raised concerns about the exit risks associated with the timing and pace of re-opening.

	Estimated share of positive tests for 7 day period ending:				
State	March 25	April 1	April 8	April 15	April 22
Arizona	5%	7%	10%	10%	13%
Arkansas	5	5	6	8	9
Colorado	11	20	23	24	25
Connecticut	11	25	35	35	39
D.C.	7	14	24	21	27
Delaware	3	7	16	17	22
Illinois	12	21	24	23	24
Iowa	3	8	10	13	23
Kansas	4	10	13	10	14
Kentucky	4	7	7	13	15
Maryland	4	11	20	24	24
Massachusetts	7	20	24	30	29
Minnesota	3	4	5	7	10
Mississippi	5	7	7	9	9
Missouri	3	8	12	12	11
Nebraska	2	5	8	9	18
New Jersey	19	46	55	53	54
New Mexico	2	3	6	7	7
North Carolina	3	6	9	8	10
North Dakota	1	3	3	3	8
Ohio	4	10	13	13	24
Pennsylvania	5	15	25	25	24
Rhode Island	6	11	11	17	16
South Dakota	2	4	10	24	21
Virginia	6	12	17	19	22

Source: fivethirtyeight.com, "Coronavirus Cases Are Still Grow ing In Many U.S. States"

Restoring Public Health

Transmission: Once in a Century

Suppression: Virus Response Matters Most

Lockdown: Unprecedented

Exit Risk: Resurgence & Return

Co-Existence: Testing & Tracing Infrastructure

Summary Progress of Virus Suppression

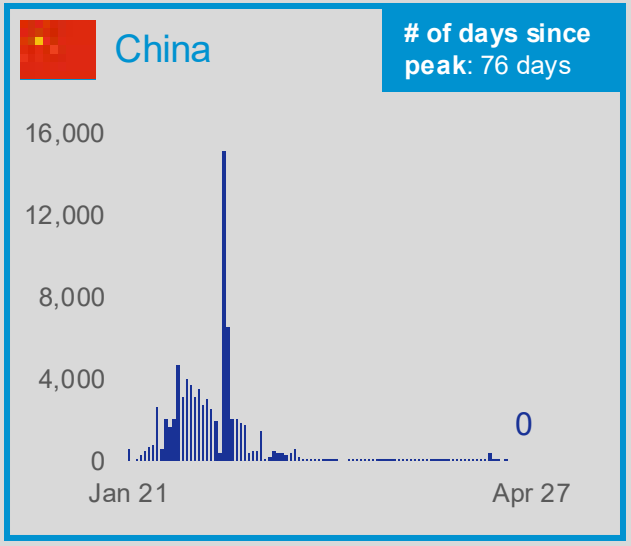
After appearing to reach peak confirmed cases in early April (as NY peaked), the US returned higher to new peaks just days ago, with daily confirmed case counts remaining stubbornly high above the 20K level for much of the month

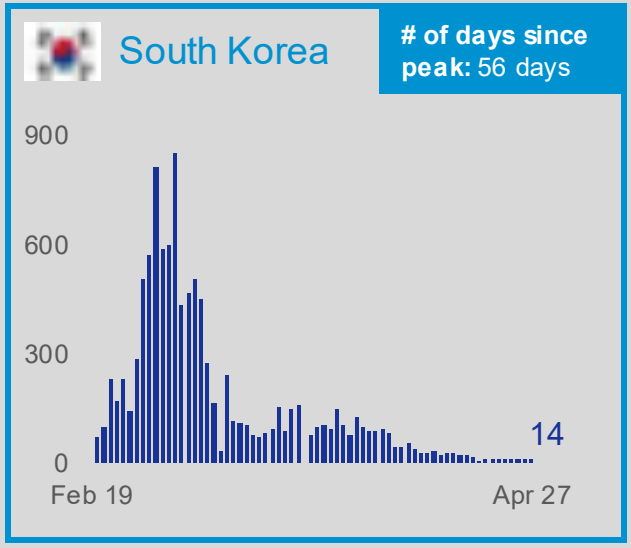
	Country	Peak date for daily new confirmed cases	# of peak daily new confirmed cases	# of current daily new confirmed cases	# of days since peak daily new cases
Asia-Pacific	China	Feb 13	15,100	0	76
	South Korea	Mar 3	851	14	56
	Australia	Mar 28	497	7	31
	Japan	Apr 17	1,200	712	11
	India	Apr 19	1,900	1,600	9
	Singapore	Apr 20	1,400	799	8
Europe	Italy	Mar 21	6,600	1,700	38
	Spain	Mar 25	9,600	2,800	34
	Austria	Mar 26	1,300	49	33
	Germany	Apr 2	6,900	988	26
	UK	Apr 10	8,700	4,300	18
	Netherlands	Apr 11	1,300	400	17
	France	Apr 12	26,800	3,700	16
	Belgium	Apr 15	2,500	553	13
NA	Canada	Apr 5	2,800	1,600	23
	US	Apr 24	36,200	22,400	4

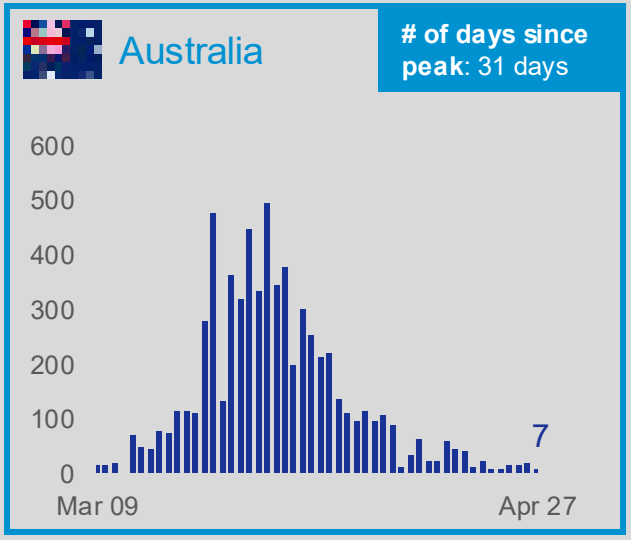
Source: Johns Hopkins Coronavirus COVID-19 Global Cases Tracker. Data as of April 28, 2020. Day 0 for number of days to peak daily new cases is the first day each country reached 100 cumulative cases.

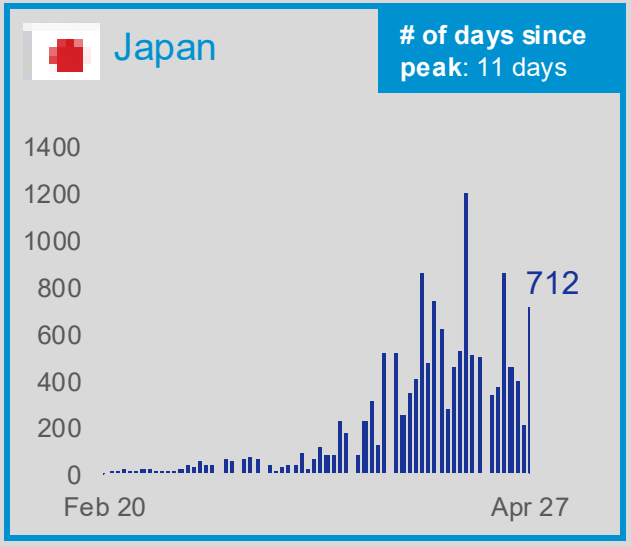
Progress of Virus Suppression

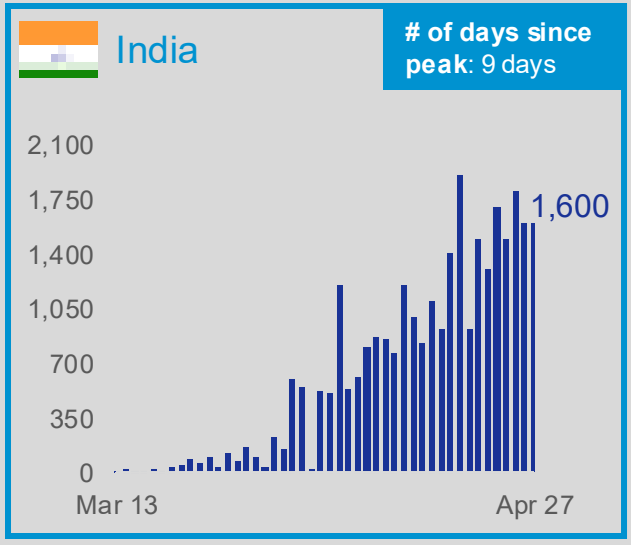
of daily new cases

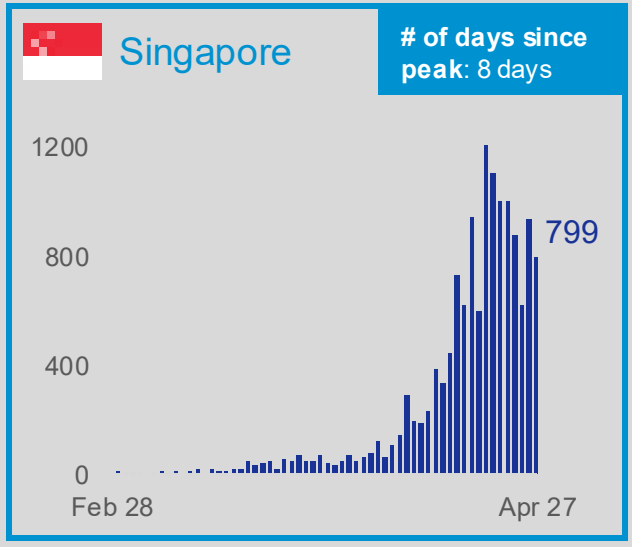












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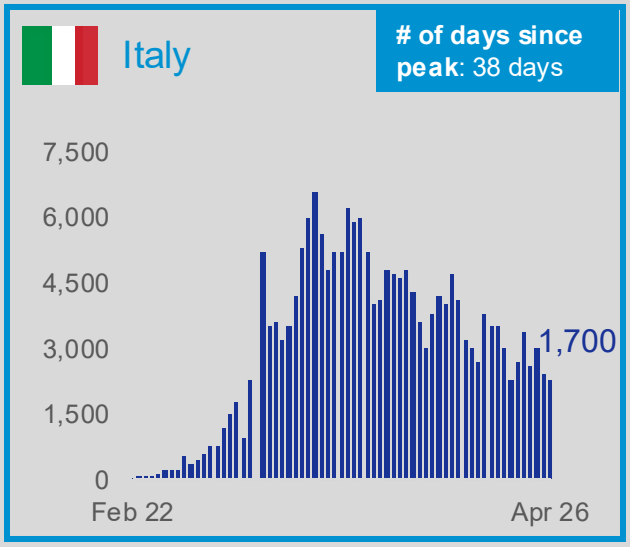

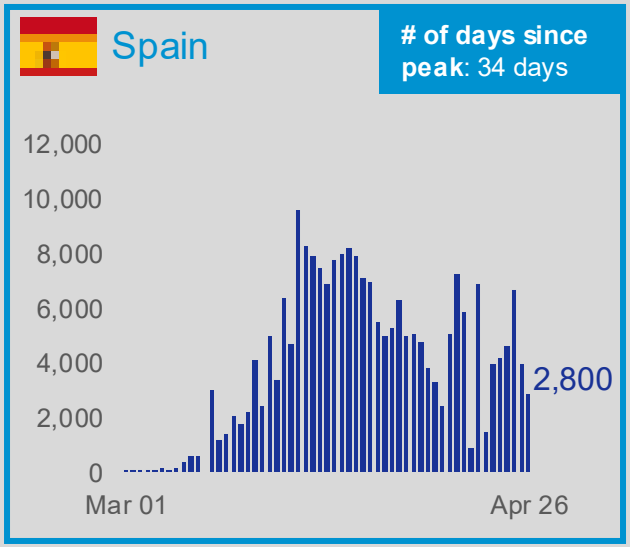

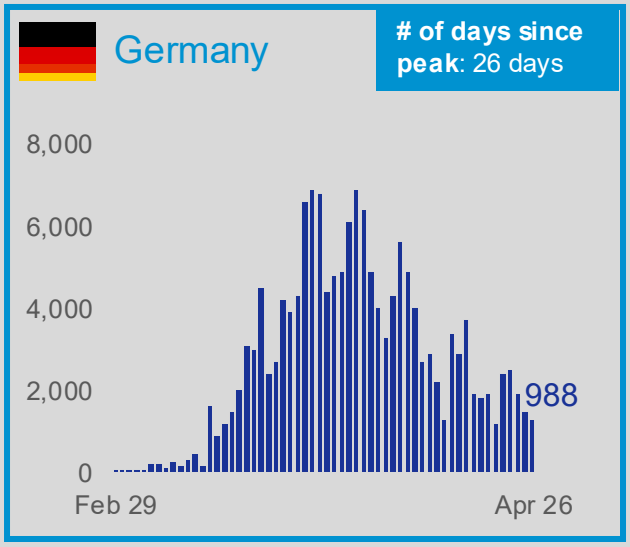

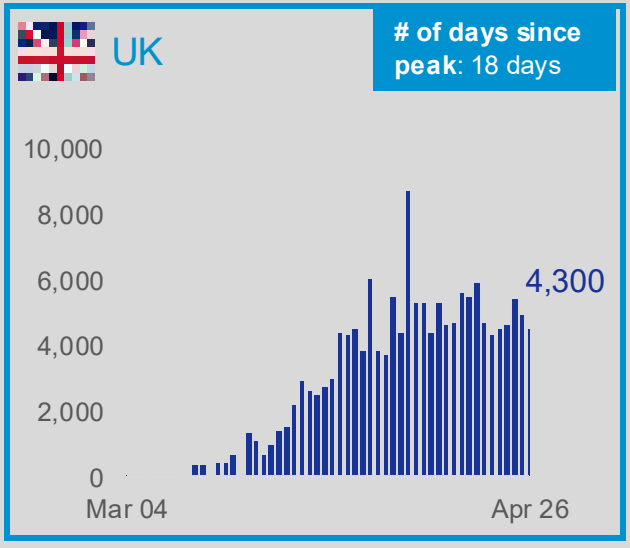

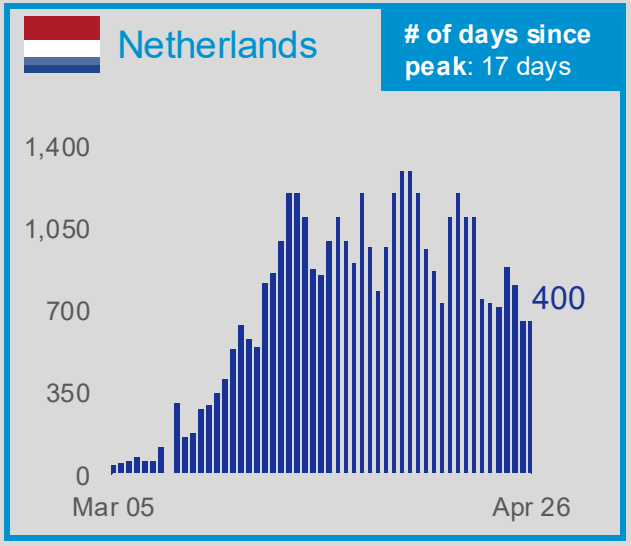

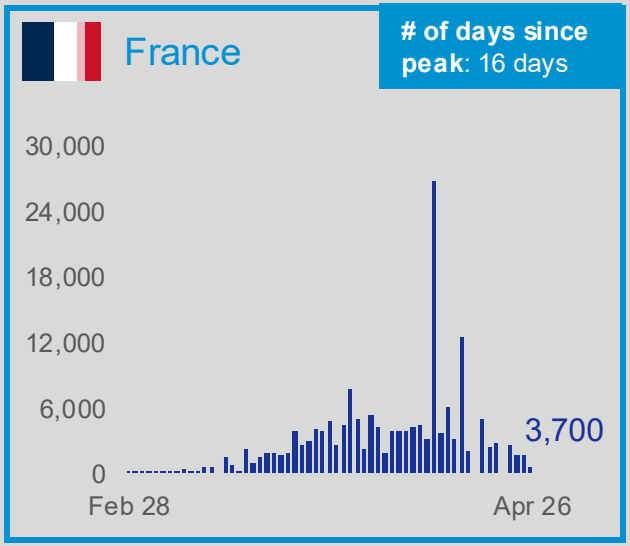

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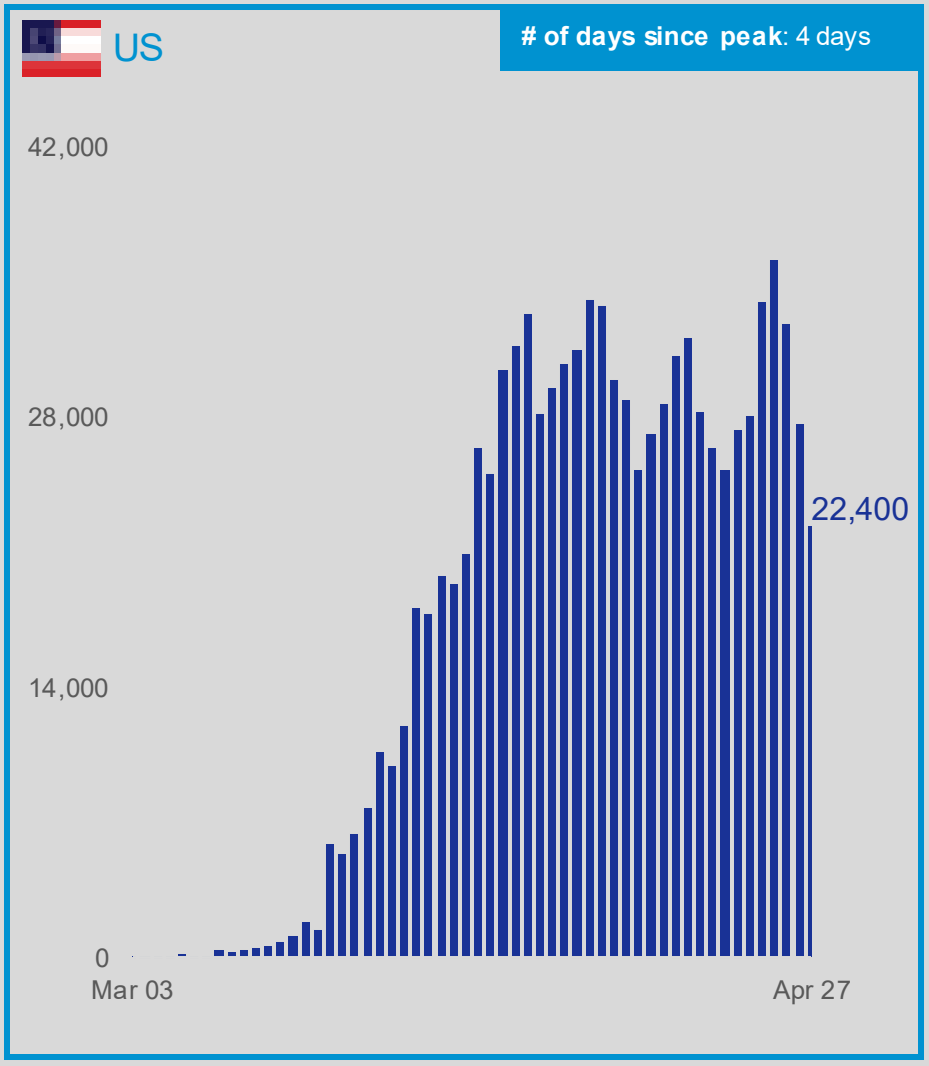

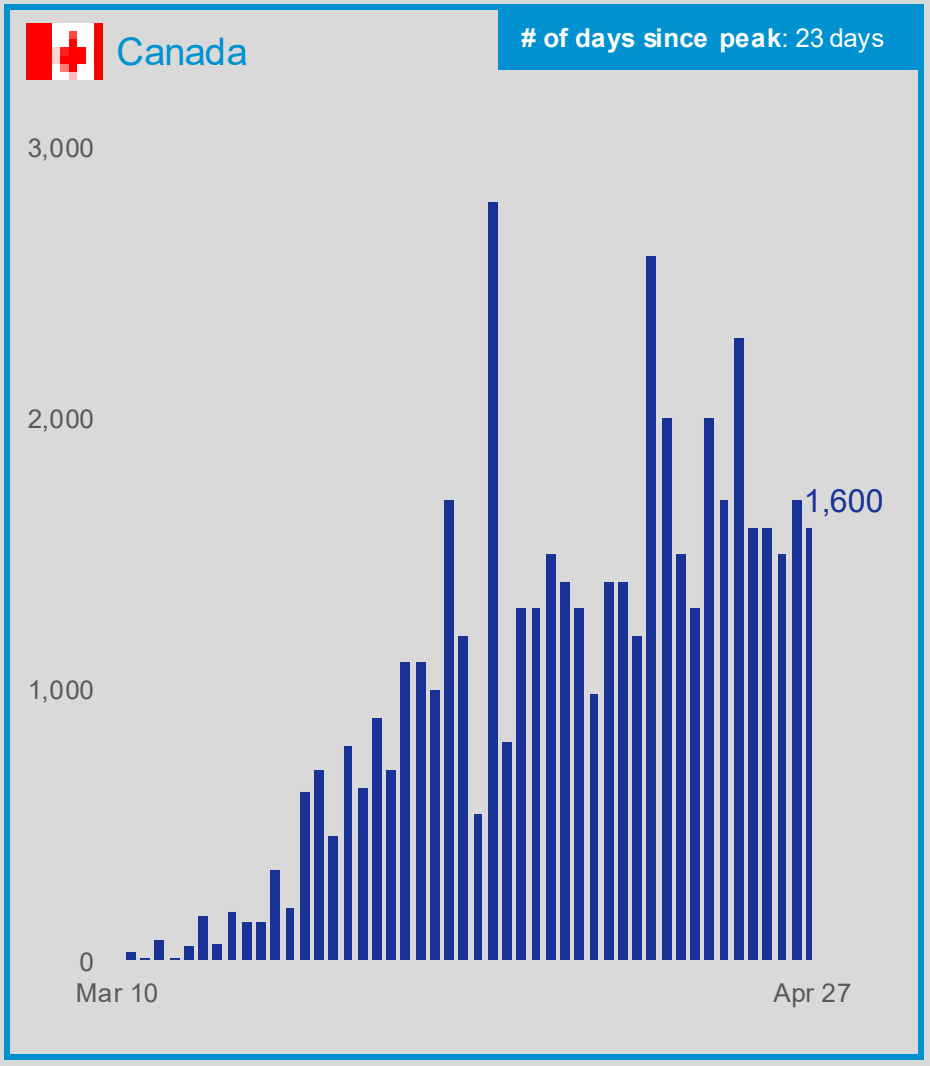

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Restoring Public Health

Transmission: Once in a Century

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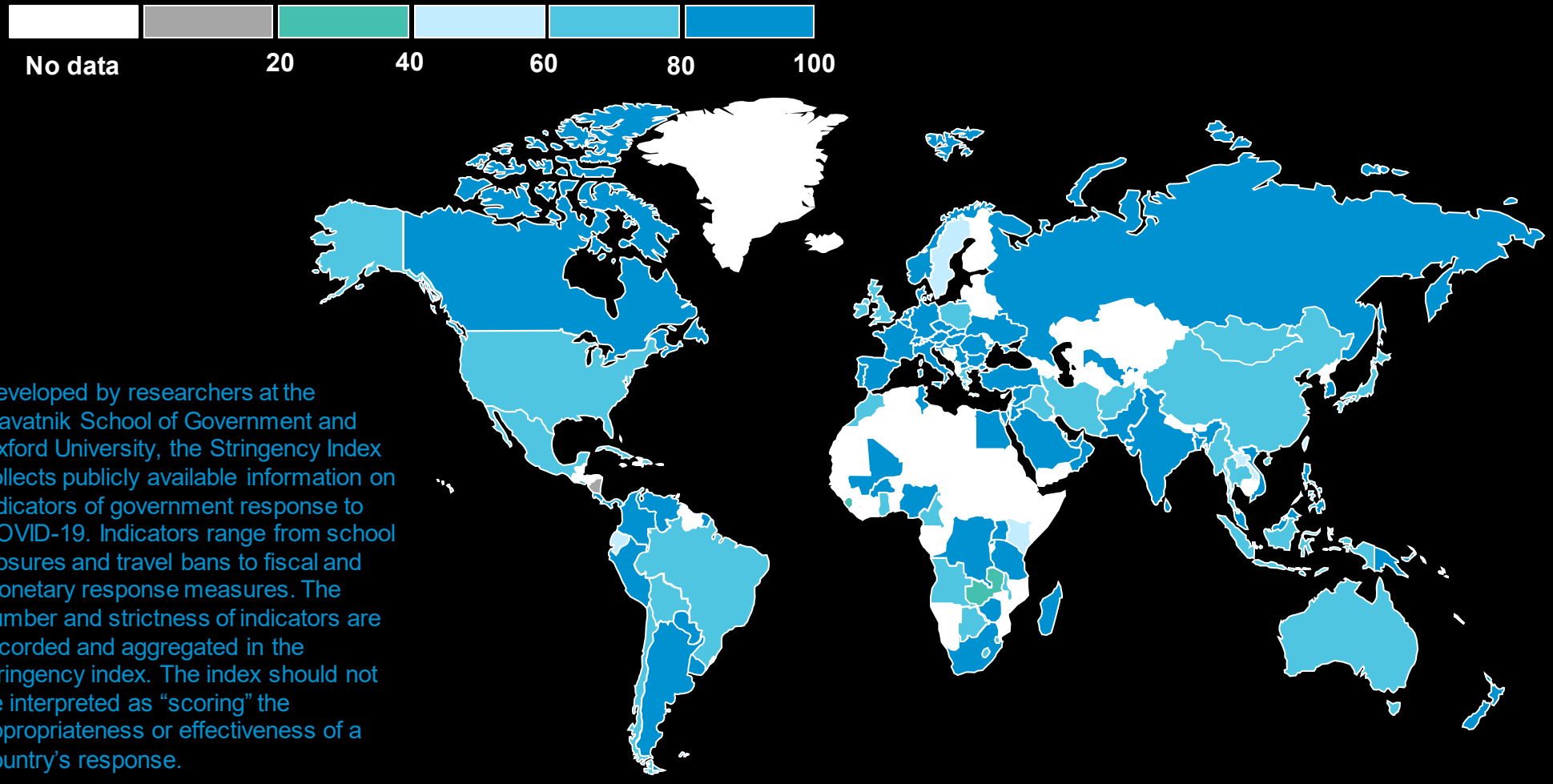
Global Economy on Lockdown

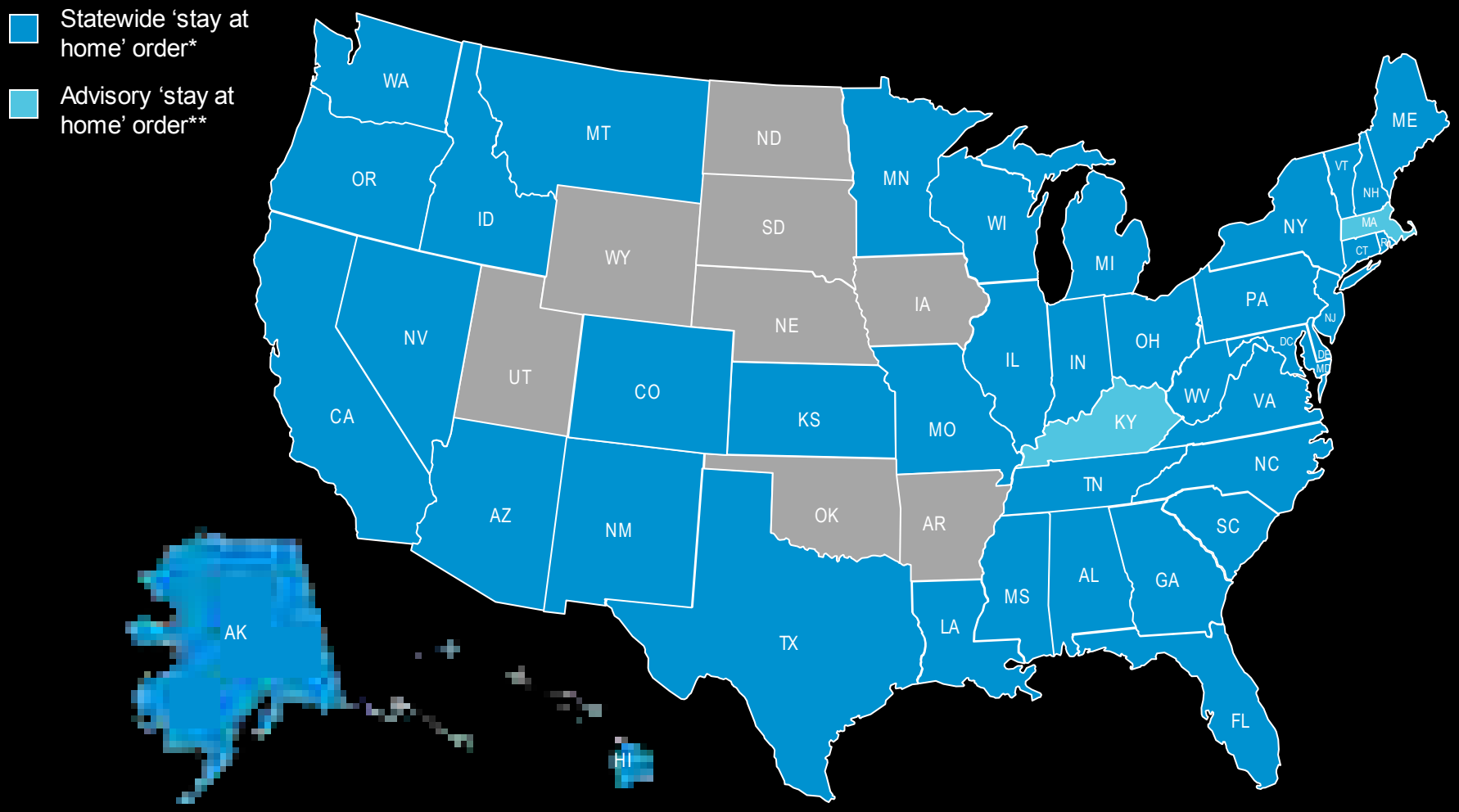
COVID-19 Government Response Stringency Index



Developed by researchers at the Blavatnik School of Government and Oxford University, the Stringency Index collects publicly available information on indicators of government response to COVID-19. Indicators range from school closures and travel bans to fiscal and monetary response measures. The number and strictness of indicators are recorded and aggregated in the stringency index. The index should not be interpreted as "scoring" the appropriateness or effectiveness of a country's response.

Source: Financial Times. Coronavirus tracked: the latest figures as the pandemic spreads. All data used for this map provided by the Blavatnik School of Government, University of Oxford. Data as of April 8.

Unprecedented US Containment Measures



Source: Financial Times. Coronavirus tracked: the latest figures as the pandemic spreads. John Hopkins University, CSSE; Worldometers; FT research
*Includes 'shelter in place' orders. **Includes Kentucky's 'healthy at home' order.

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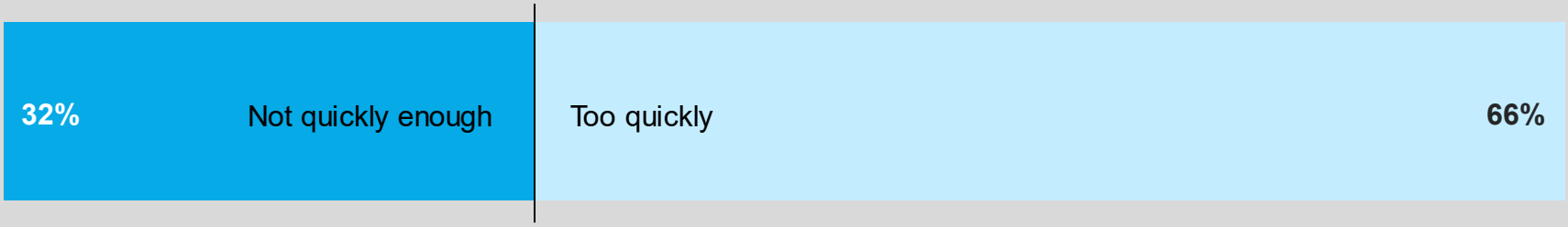
Americans Concerned About "Early Exit"

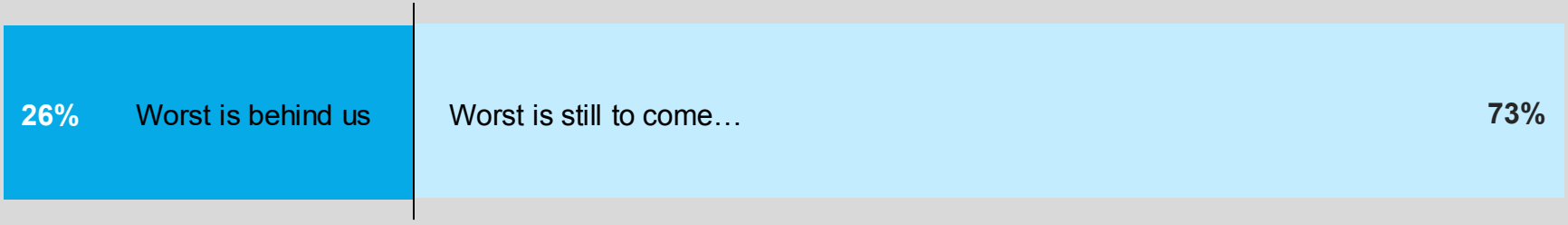
A recent national survey by Pew Research finds that while a majority of Americans favor a gradual phase-in, a growing "loud minority" are pushing for a re-open sooner than later. The risk of virus resurgence and return therefore becomes a prominent one for markets.

% who say…

Greater concern is that state governments will lift restrictions on public activity…



When it comes to the problems the U.S. is facing from the outbreak the…

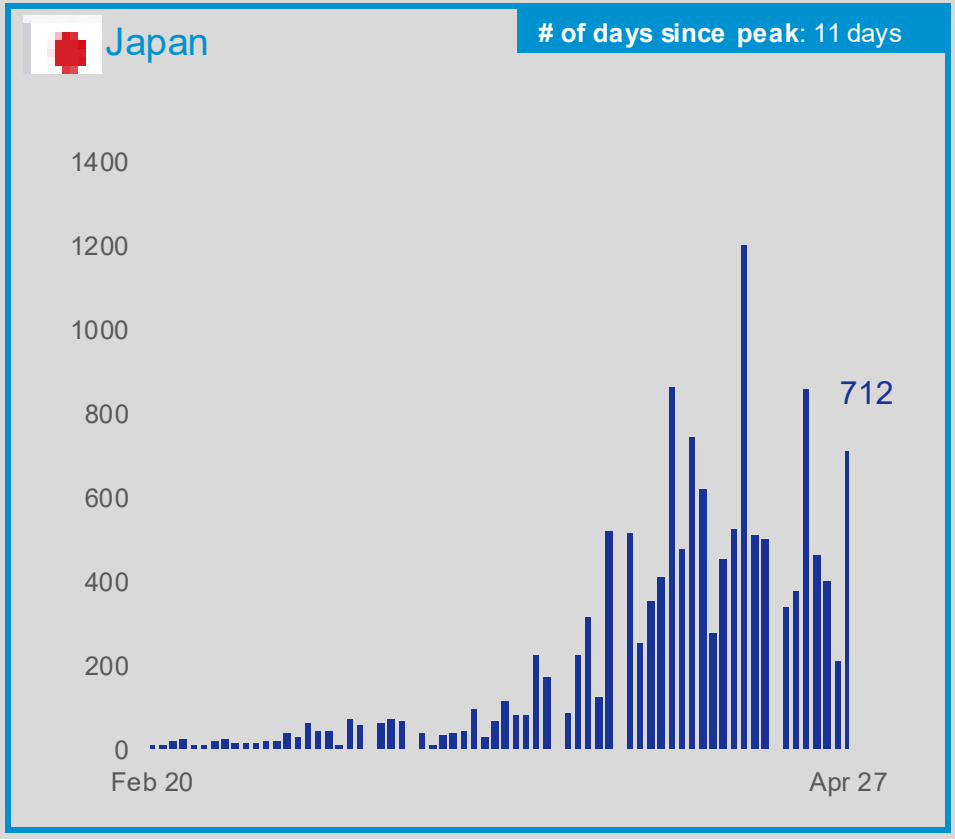


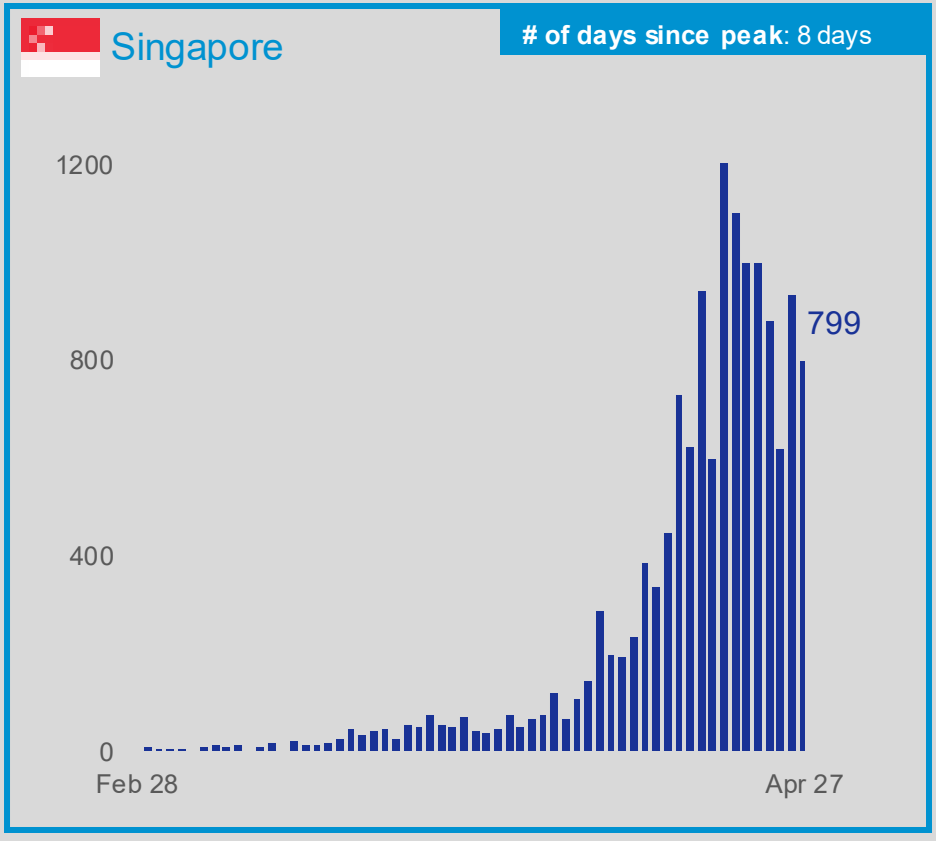
Source: Pew Research Survey of U.S. adults conducted April 7-12, 2020. Note: no answer responses not shown.

Resurgence & Exit Risk

After early success on virus suppression, Japan and Singapore are both battling "2nd waves" of virus resurgence. In Japan, a national state of emergency has since been declared in the world's 3rd largest economy. And Singapore, a city-state with just 5.7 million people, now has the highest daily case count in Southeast Asia. China is also on-guard for a 2nd wave of new cases, though data transparency remains low.

Daily increase in new cases





Source: (1-2) Johns Hopkins Coronavirus COVID-19 Global Cases Tracker. Data as of April 28, 2020. Day 0 for number of days to peak daily new cases is the first day each country reached 100 cumulative cases.

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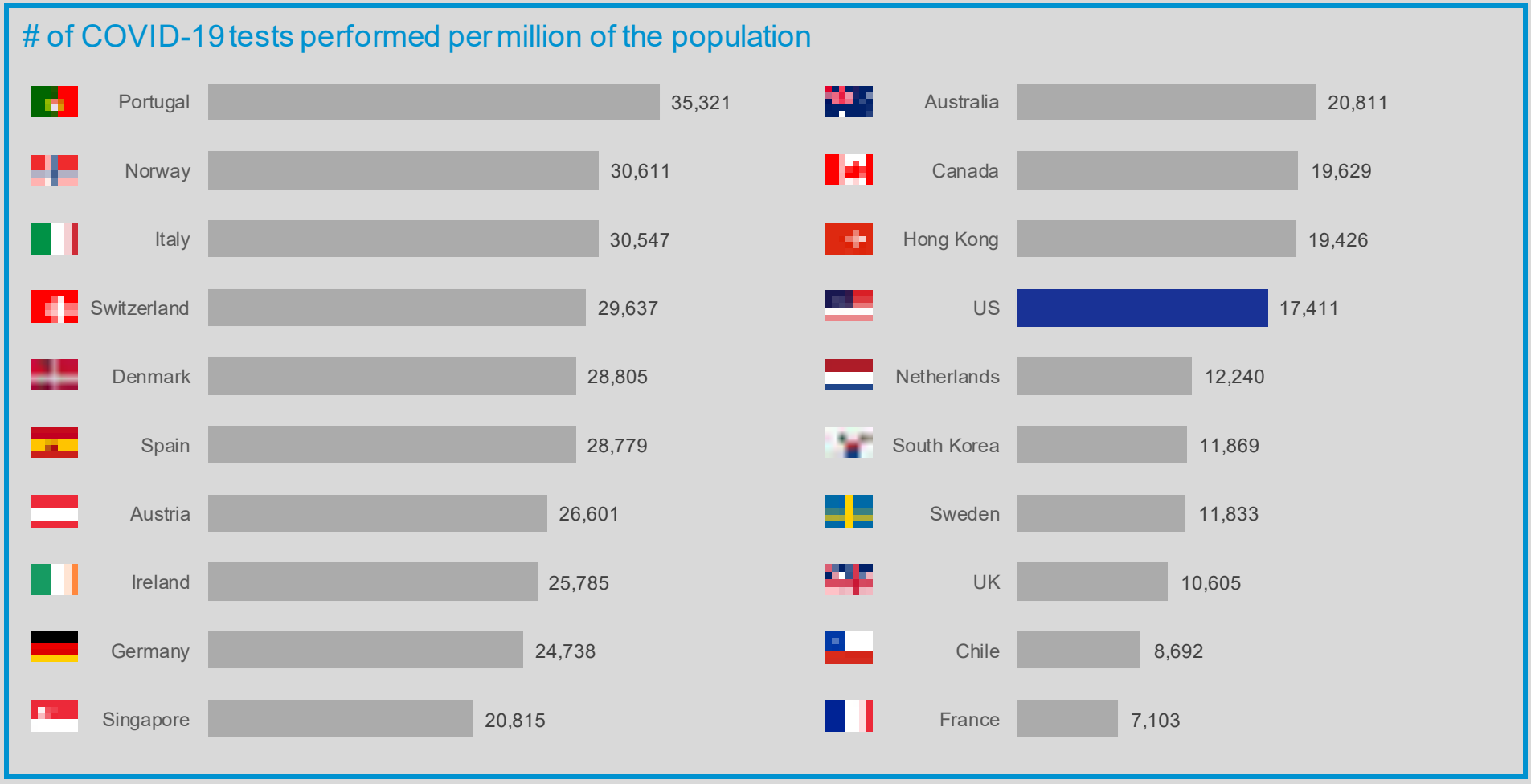
Scalable Testing Critical to Re-Opening

The United States lags well behind other major countries in arguably the single most important part of the virus response - early, vigilant and broad-based testing. While the reasons are numerous, coordination challenges at multiple levels (federal, state, local, CDC, FDA and HHS), and a failure to prioritize this need sooner, contributed to the current shortfall. This, in turn, will have implications for the phased-in re-opening of the economy.



Source: (1) Worldometers Coronavirus Pandemic. Data as of April 28, 2020.

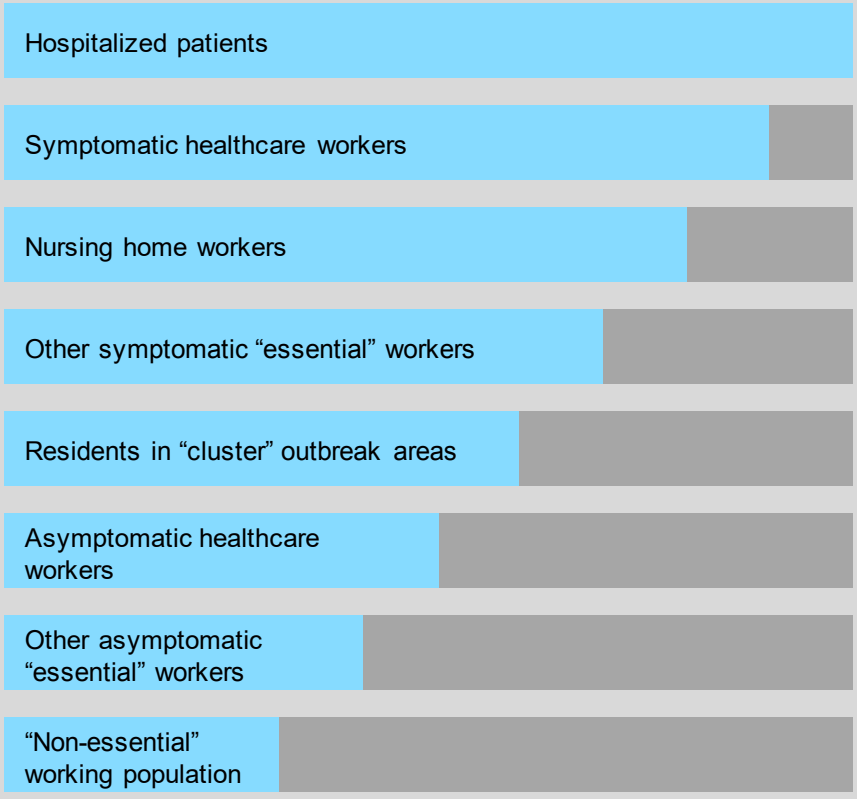
Types of Testing Needed for Re-Opening

As the economy necessitates that we learn to co-exist with the virus, broad based testing becomes critical to re-opening

Both diagnostic and antibody testing will be important

Diagnostic Tests	Antibody Tests
What?	
▪ Polymerase chain reaction (PCR) test to identify the presence of the diseases' genetic material	▪ Serologic (blood) test to identify antibody presence
Why?	
▪ Identify active cases, even when asymptomatic ▪ Important for patient treatment and understanding virus spread	▪ Understand disease presence and post-infection immunity
How Many Needed in the US?	
▪ Estimates vary widely ▪ 750 k per week to 5 million per day for initial re-opening ▪ As many as 20 million per day for full economic remobilization	▪ Dependent on durability of immunity
Current Status	
▪ 1 million per week	▪ Many antibody tests currently unreliable ▪ Immunity duration & durability not known

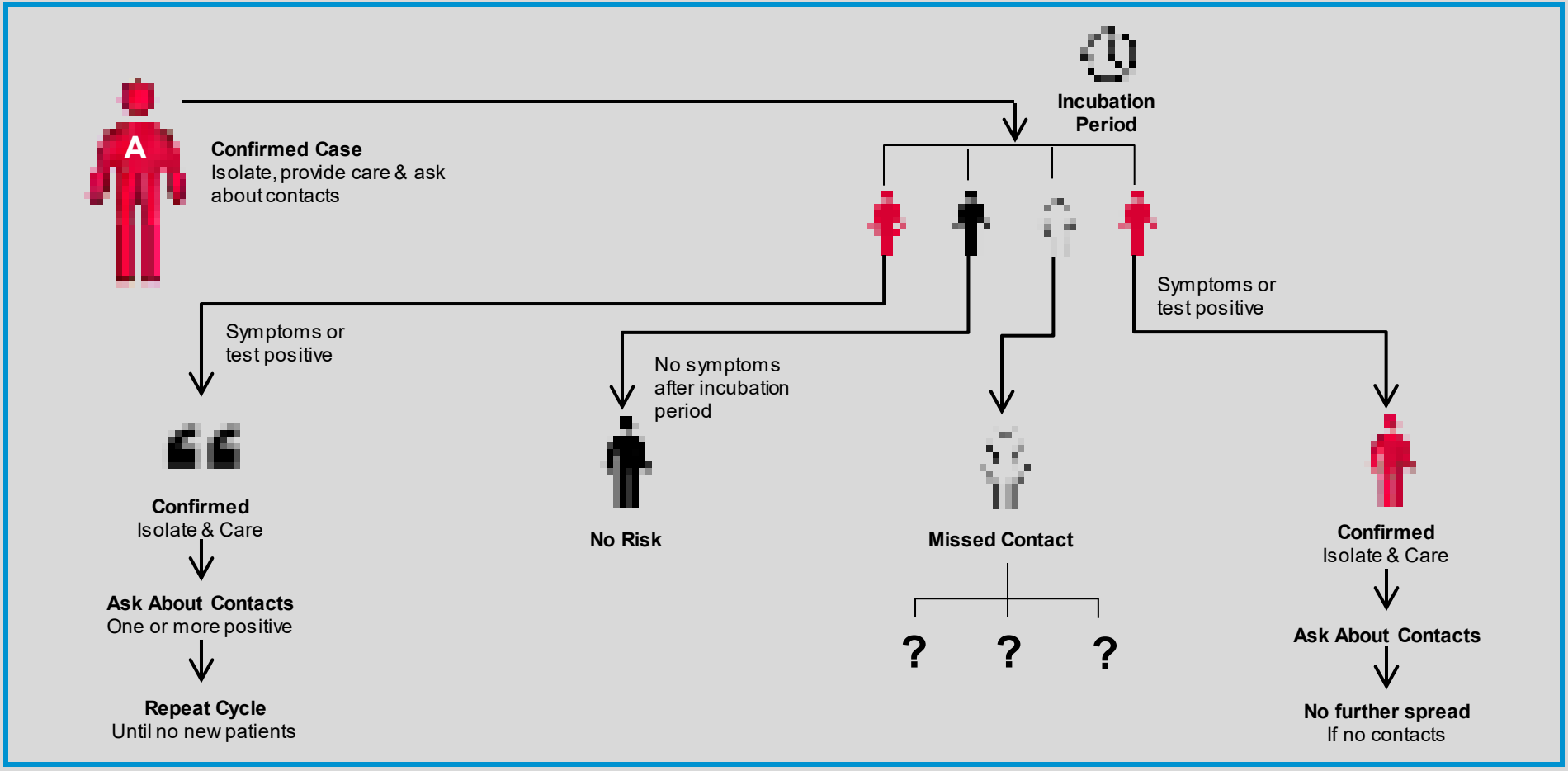
With a fully re-opened economy requiring millions more daily tests than currently available, a "targeted" testing approach, which is scaled over time, becomes necessary



Source: Harvard Business Review "How Digital Contact Tracing Slow ed Covid-19 in East Asia". Harvard Safra Center "Roadmap to Pandemic Resilience". Center for American Progress. American Enterprise Institute.

Manual Contact Tracing

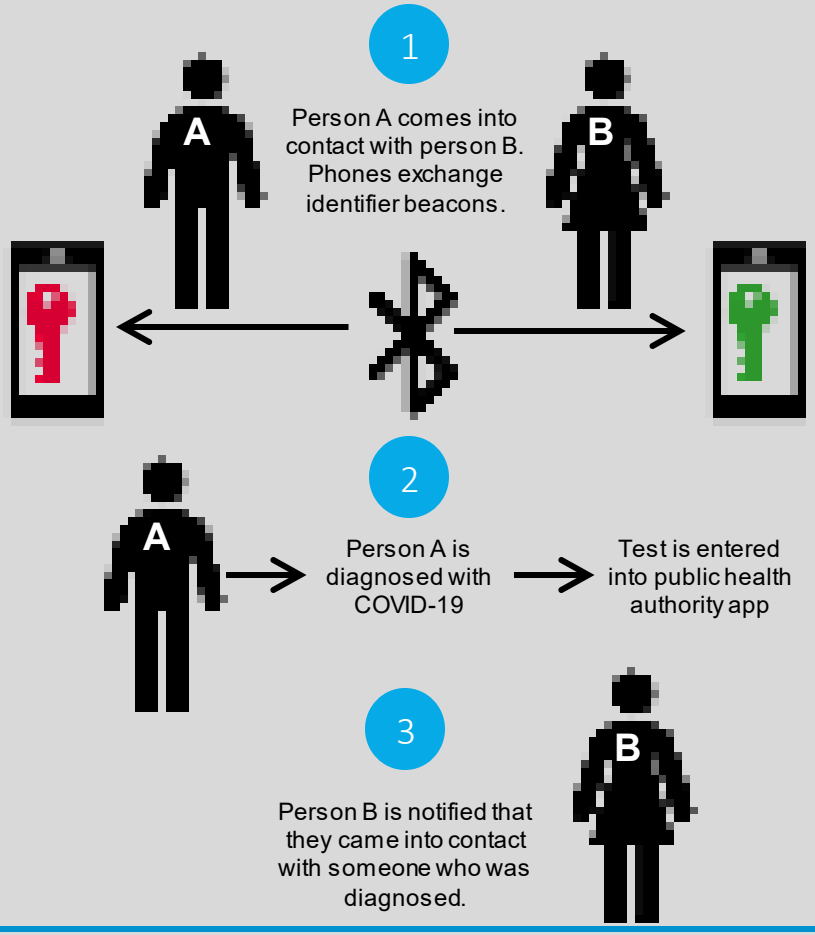
Manual contact tracing requires public health workers to interview all confirmed COVID cases, track their contacts in the prior weeks and interview those people for symptoms. Key challenges to manual contact tracing include: i) in the US alone, up to 100,000 people would need to be hired and trained to conduct tracing interviews; ii) with 20-40% of cases asymptomatic, manual tracing can be slow and overlook cases; iii) the process is reliant on human memory which can be inconsistent.



Source: Harvard Business Review "How Digital Contact Tracing Slowed Covid-19 in East Asia". Harvard Safra Center "Roadmap to Pandemic Resilience". Center for American Progress. American Enterprise Institute.

Digitized Contact Tracing

Digitized contact tracing could utilize cell phone Bluetooth and GPS data to instantaneously notify individuals who have had contact with a person who tests positive for COVID-19. If used effectively, this would allow individuals to isolate and test to prevent further spread. However, digital tracing networks require high smartphone penetration and population adoption which has been a challenge in numerous jurisdictions. Data privacy is also a concern.



- The US and many other Western democracies do not currently have the technological infrastructure to support automatic tracing apps
  - Many East Asian countries already have infrastructure in place from prior outbreaks (2015 MERS outbreak in South Korea, 2003 SARS outbreak in Taiwan)
- In order to be effective, adoption must be universal
  - Need a minimum utilization of approximately 70% to be effective
  - Government mandate or voluntary use
  - Enforcement of use and isolation if necessary
  - Alternatives for people without smartphones (older & lower income populations)
- To combat the spread of the virus, sharing data on confirmed and suspected cases is essential, but also raises serious concerns over data privacy
  - Concerns over privacy and civil liberties, particularly in Western democracies
  - Data sovereignty and anonymity

Source: Harvard Business Review "How Digital Contact Tracing Slowed Covid-19 in East Asia". Harvard Safra Center "Roadmap to Pandemic Resilience". Center for American Progress. American Enterprise Institute.

Digital Testing & Immunity Passports

As we begin the new phase of gradually re-opening the economy, testing and tracing become critical to preventing a resurgence in COVID cases and a second wave of economic stoppage. Digital tracing and health QR codes could become commonplace in the "new normal" we return to.

Green

Enables its holder to move unrestricted and travel freely

Yellow

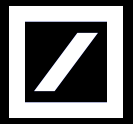
Report immediately. May be asked to stay home for 7 days.

Red

Report immediately. Two-week quarantine required.

Source: New York Times, March 1, 2020

Re-Opening the Economy



"The notion that there's a control room in the West Wing and that this group will gather around the President and say 'Go ahead, press the button, sir, we are going to restart' – that's not how the US economy works."

Douglas Holtz-Eakin, Former Head of the US Council of Economic Advisors under President George Bush

Re-Opening the Economy

- Phased-In Re-Opening
- Hierarchy of Activity Resumption
- The Mandated Recession
- Crisis from the Bottom
- Monetary & Fiscal Bridges

Roadmap for Re-Opening the Economy

Similar to the monetary and fiscal response, scalability remains an enormous challenge in the virus response. Re-opening the economy will be a gradual process that will require a robust testing and tracing architecture in order to be successful.

#1 Virus Suppression
- Consistent pattern of declining cases
- Consistent pattern of declining hospitalizations
- CDC guidelines specify 14 declining days

#2 Strengthen Healthcare Capacity
- Beds, ventilators and IC units
- PPE for healthcare workers
- Technology enabled coordination and communication

#3 Scalable Testing
- Diagnostic, antibody and fever testing
- Hierarchy of targets (healthcare & essential workers)
- 2-6% of population, daily (over time)

#4 Scalable Contact Tracing
- Manual & digitally based
- Isolation & quarantines
- 40-80% thresholds needed to succeed (over time)
- Apple-Google JV on peer tracing apps

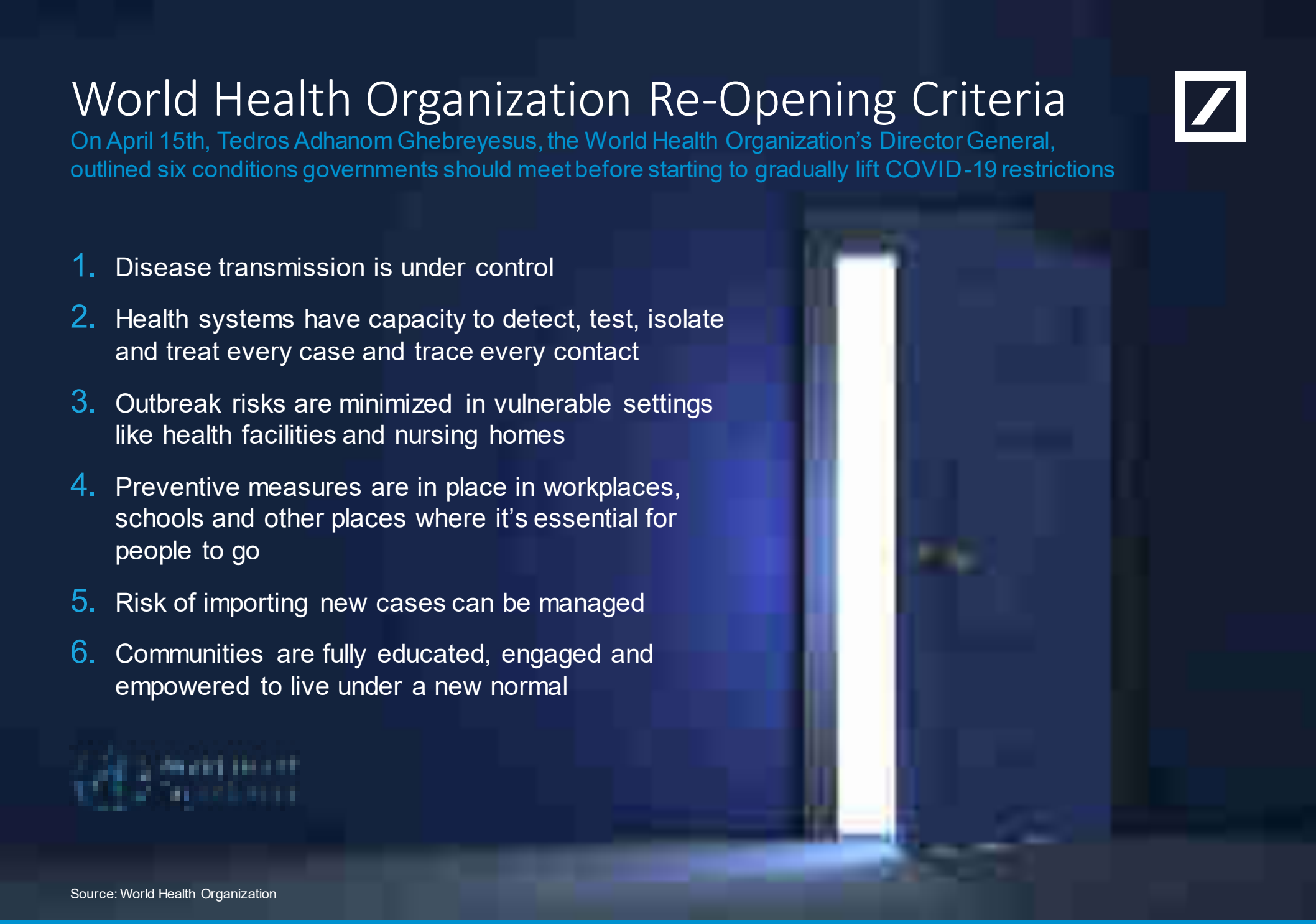
#5 Gradual Re-opening (State-by-State)
- Expand essential workforce (over time)
- Ring-fence elderly & preconditions
- Phased-in activity resumption
- Mask-wearing transition period

#6 Accelerate Production of Treatments
- Streamlined and scalable clinical trials
- Therapeutic treatments (plasma, manufactured antibodies)
- RNA vaccines

Source: Center for American Progress "A National and State Plan to End the Coronavirus Crisis", The American Enterprise Institute "National Coronavirus Response: A Road Map to Re-opening". Harvard University, Edmond J. Safra Center for Ethics "Roadmap to Pandemic Resilience".

World Health Organization Re-Opening Criteria

On April 15th, Tedros Adhanom Ghebreyesus, the World Health Organization's Director General, outlined six conditions governments should meet before starting to gradually lift COVID-19 restrictions



1. Disease transmission is under control
2. Health systems have capacity to detect, test, isolate and treat every case and trace every contact
3. Outbreak risks are minimized in vulnerable settings like health facilities and nursing homes
4. Preventive measures are in place in workplaces, schools and other places where it's essential for people to go
5. Risk of importing new cases can be managed
6. Communities are fully educated, engaged and empowered to live under a new normal

Source: World Health Organization

White House "Re-Opening" Protocols

Although the White House "re-opening" plan requires US states to have 14 straight days of declining confirmed cases, numerous US states have nonetheless prematurely begun to relax selected social distancing measures.

"Gating Criteria" should be met before starting Phase 1 and again before moving to subsequent phases

- Symptoms: Downward trajectory over 14 day period
- Cases: Downward over 14 day period
- Hospitals: Adequate treatment capacity and available testing for at-risk healthcare staff

Phase 1	Phase 2	Phase 3
For states & regions that satisfy the gating criteria	With no evidence of rebound and when gating criteria is met for a second time	With no evidence of rebound and when gating criteria is met for a third time
Individuals: ▪ "Ring-fence" vulnerable individuals ▪ Continue social distancing in public ▪ Avoid groups of 10 or more ▪ Minimize non-essential travel	Individuals: ▪ "Ring-fence" vulnerable individuals ▪ Continue social distancing in public ▪ Non-essential travel can resume	Individuals: ▪ Vulnerable individuals practice social distancing ▪ Low risk individuals minimize time spent in crowded environments
Employers: ▪ Encourage telework where possible ▪ Return to work in phases where possible ▪ Close common areas ▪ Minimize non-essential travel	Employers: ▪ Encourage telework where possible ▪ Close common areas ▪ Non-essential travel can resume	Employers: ▪ Resume unrestricted staffing
Specific Types of Businesses: ▪ **Schools** remain closed ▪ **Large venues** open with strict physical distancing protocols ▪ **Gyms** can open if they use physical distancing and sanitation protocols ▪ **Bars** remain closed	Specific Types of Businesses: ▪ **Schools** can re-open ▪ **Large venues** open with moderate physical distancing protocols ▪ **Gyms** can open if they use physical distancing and sanitation protocols ▪ **Bars** can open with reduced capacity	Specific Types of Businesses: ▪ **Large venues** open with limited physical distancing protocols ▪ **Gyms** can open if they use sanitation protocols ▪ **Bars** to operate with increased capacity

Source: Politico. WSJ. The White House "Opening Up America Again".

Re-Opening Models: State by State Estimates

The University of Washington's Institute for Health Metrics and Evaluation (IHME) has modeled when states may begin to gradually "re-open". Estimated re-open dates are based on numerous variables including declining case counts to 1 per 1 million population. The actual re-opening dates may be subject to political considerations and could vary from the model.

State	Gov't Mandated Social Distancing				Projected Gradual Re-Opening Date
	Mass Gathering Restrictions	Schools Closed	Non-Essential Services Closed	Stay at Home Orders	
Alabama	Mar 20	Mar 19	Mar 28	Apr 4	May 18
Alaska	Mar 24	Mar 16	Mar 28	Mar 28	May 11
Arizona	Mar 30	Mar 16	N/A	Mar 30	June 8
Arkansas	Mar 27	Mar 17	N/A	N/A	June 22
California	Mar 11	Mar 19	Mar 19	Mar 19	May 18
Colorado	Mar 19	Mar 23	Mar 26	Mar 26	May 25
Connecticut	Mar 12	Mar 17	Mar 23	N/A	June 1
Delaware	Mar 16	Mar 16	Mar 24	Mar 24	May 18
D.C.	Mar 13	Mar 16	Mar 25	Mar 30	June 8
Florida	Apr 3	Mar 17	N/A	Apr 3	June 1

State	Gov't Mandated Social Distancing				Projected Gradual Re-Opening Date
	Mass Gathering Restrictions	Schools Closed	Non-Essential Services Closed	Stay at Home Orders	
Georgia	Mar 24	Mar 18	N/A	Apr 3	June 15
Hawaii	Mar 16	Mar 19	Mar 25	Mar 25	May 4
Idaho	Mar 25	Mar 23	Mar 25	Mar 25	May 11
Illinois	Mar 13	Mar 17	Mar 21	Mar 21	May 25
Indiana	Mar 12	Mar 19	Mar 24	Mar 25	May 25
Iowa	Mar 17	Apr 4	N/A	N/A	June 29
Kansas	Mar 17	Mar 17	N/A	Mar 30	June 1
Kentucky	Mar 19	Mar 20	Mar 26	N/A	June 8
Louisiana	Mar 13	Mar 16	Mar 22	Mar 23	May 18
Maine	Mar 18	Mar 16	Mar 25	Apr 2	May 18

Note: Re-opening date refers to the date when it may be possible to relax social distancing measures with containment strategies (testing, contact tracing, isolation, and limiting gathering sizes). Dates based on when expected infection rates will drop below 1 per 1 million people in a given area and are informed by public health funding.
Source: (1) University of Washington. IHME Health Data.

Re-Opening Models: State by State Estimates

State	Gov't Mandated Social Distancing				Projected Gradual Re-Opening Date
	Mass Gathering Restrictions	Schools Closed	Non-Essential Services Closed	Stay at Home Orders	
Maryland	Mar 16	Mar 16	Mar 23	Mar 30	June 8
Massachusetts	Mar 13	Mar 17	Mar 24	N/A	June 8
Michigan	Mar 13	Mar 16	Mar 23	Mar 24	May 18
Minnesota	Mar 27	Mar 18	N/A	Mar 27	May 25
Mississippi	Mar 24	Mar 19	Apr 3	Arp 3	June 1
Missouri	Mar 23	Mar 23	N/A	Apr 5	June 1
Montana	Mar 24	Mar 15	Mar 26	Mar 26	May 4
Nebraska	Mar 16	Apr 2	N/A	N/A	June 29
Nevada	Mar 19	Mar 16	Mar 21	Mar 31	May 18
New Hampshire	Mar 16	Mar 16	Mar 28	Mar 27	May 11
New Jersey	Mar 16	Mar 18	Mar 21	Mar 21	June 1
New Mexico	Mar 12	Mar 13	Mar 24	N/A	May 18
New York	Mar 12	Mar 18	Mar 22	Mar 22	June 1
North Carolina	Mar 14	Mar 14	Mar 30	Mar 30	May 11
North Dakota	N/A	Mar 16	N/A	N/A	June 29
Ohio	Mar 12	Mar 16	Mar 23	Mar 23	May 18

State	Gov't Mandated Social Distancing				Projected Gradual Re-Opening Date
	Mass Gathering Restrictions	Schools Closed	Non-Essential Services Closed	Stay at Home Orders	
Oklahoma	Mar 24	Mar 17	Apr 1	N/A	June 15
Oregon	Mar 12	Mar 16	N/A	Mar 23	May 25
Pennsylvania	Apr 1	Mar 17	Mar 23	Apr 1	June 1
Rhode Island	Mar 17	Mar 16	N/A	Mar 28	June 8
South Carolina	Mar 18	Mar 16	N/A	Apr 7	June 1
South Dakota	Apr 6	Mar 16	N/A	N/A	June 22
Tennessee	Mar 23	Mar 20	Apr 1	Apr 2	May 25
Texas	Mar 21	Mar 19	N/A	Apr 2	June 1
Utah	Mar 17	Mar 16	N/A	N/A	June 15
Vermont	Mar 13	Mar 18	Mar 25	Mar 24	May 4
Virginia	Mar 15	Mar 16	N/A	Mar 30	June 8
Washington	Mar 11	Mar 13	Mar 25	Mar 23	May 18
West Virginia	Mar 24	Mar 14	Mar 24	Mar 25	May 4
Wisconsin	Mar 17	Mar 18	Mar 25	Mar 25	May 18
Wyoming	Mar 20	Mar 19	N/A	N/A	May 25

Note: Re-opening date refers to the date w hen it may be possible to relax social distancing measures w ith containment strategies (testing, contact tracing, isolation, and limiting gathering sizes). Dates based on w hen expected infection rates will drop below 1 per 1 million people in a given area and are informed by public health funding.
Source: (1) University of Washington. IHME Health Data.

Re-Opening the Economy

Phased-In Re-Opening

Hierarchy of Activity Resumption

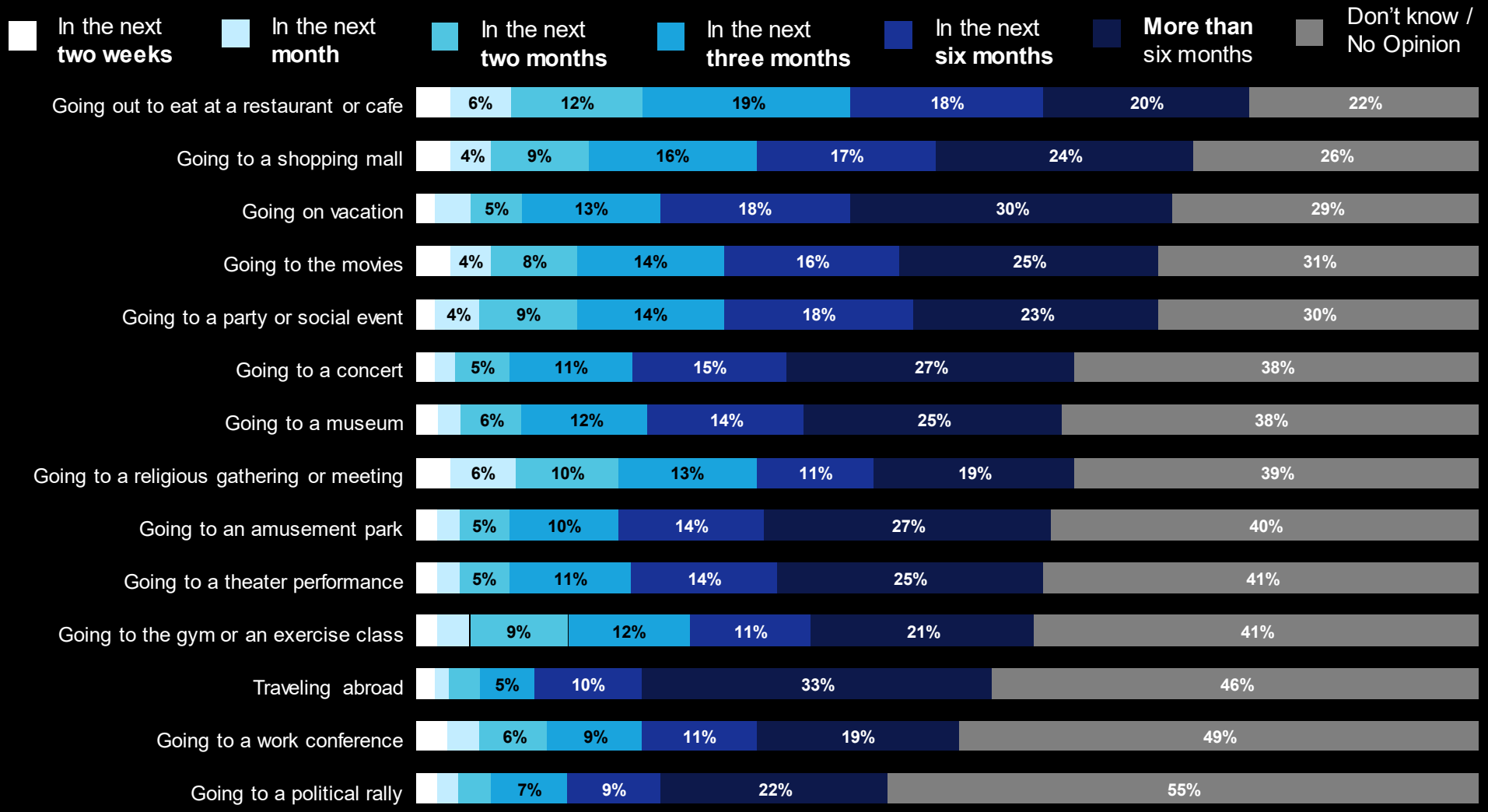
The Mandated Recession

Crisis from the Bottom

Monetary & Fiscal Bridges

Comfort Level With Resuming Activity

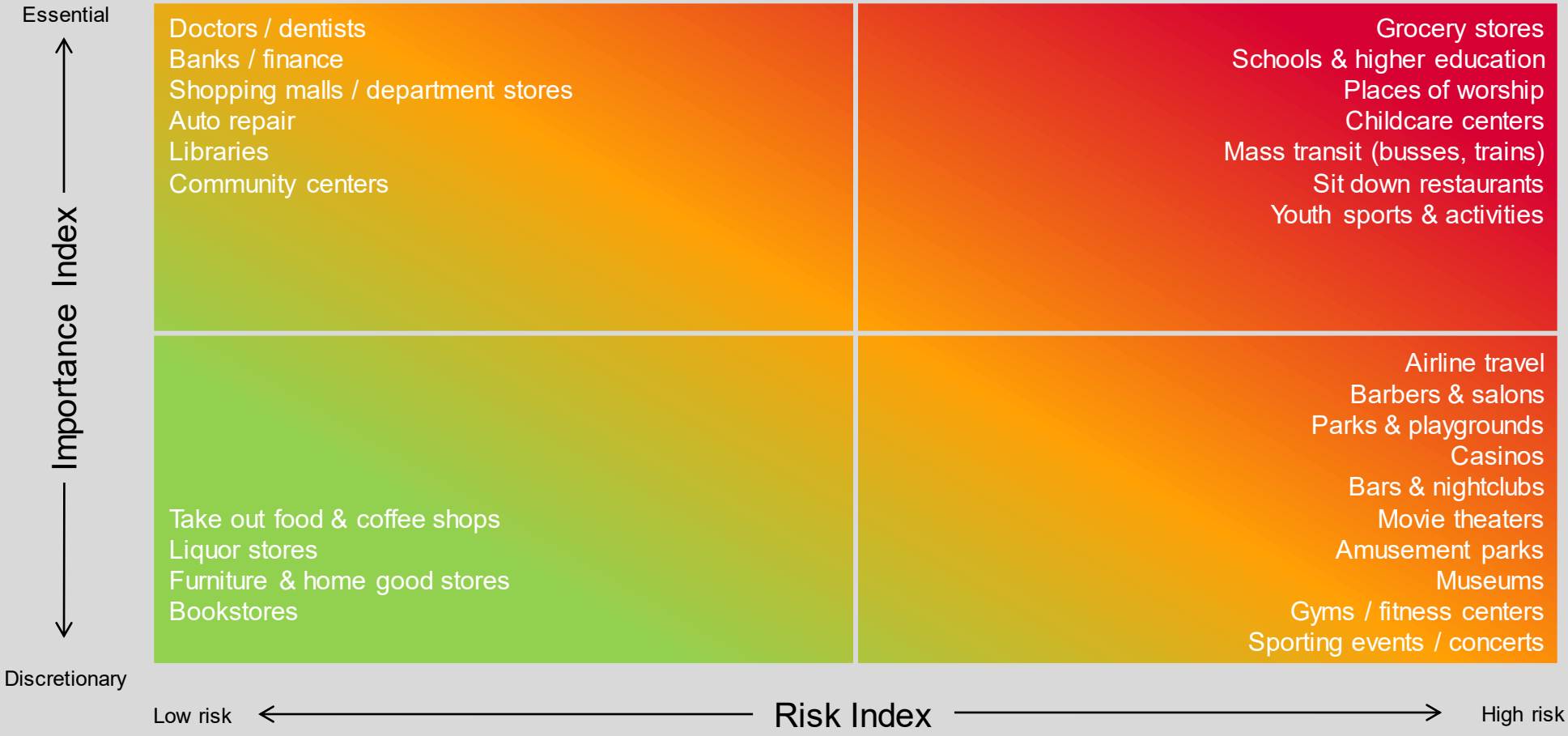
Despite some US states beginning to lift COVID-19 distancing restrictions, many US consumers don't expect to feel comfortable returning to social activities for 6 months or more. Ultimately, consumer comfort, rather than government policy, will have the most profound impact on the shape of the US recovery.



Source: Morning Consult, When Consumers Say They'll Feel OK About Dining Out and Other Activities. Survey of 2,200 US adults taken between April 7-9, 2020.

Activity Importance & Risk Matrix for Re-Opening

As the US and other economies move towards a gradual re-opening, higher importance and lower risk activities will return at a more rapid pace than higher risk and non-essential services



Source: Benzell, Seth and Collis, Avinash and Nicolaides, Christos, Rationing Social Contact During the COVID-19 Pandemic: Transmission Risk and Social Benefits of US Locations (April 18, 2020). DB Global Markets Research (Torsten Slok).

Risk Considerations in a Phased Re-Opening

Johns Hopkins' Bloomberg School for Public Health produced a high-level risk assessment of various sectors and activities to assist US Governors as they begin phased re-opening of the economy

Sector risk assessment: Contact Intensity refers to contact type (close to distant); # of Contacts addresses the number of people in the setting

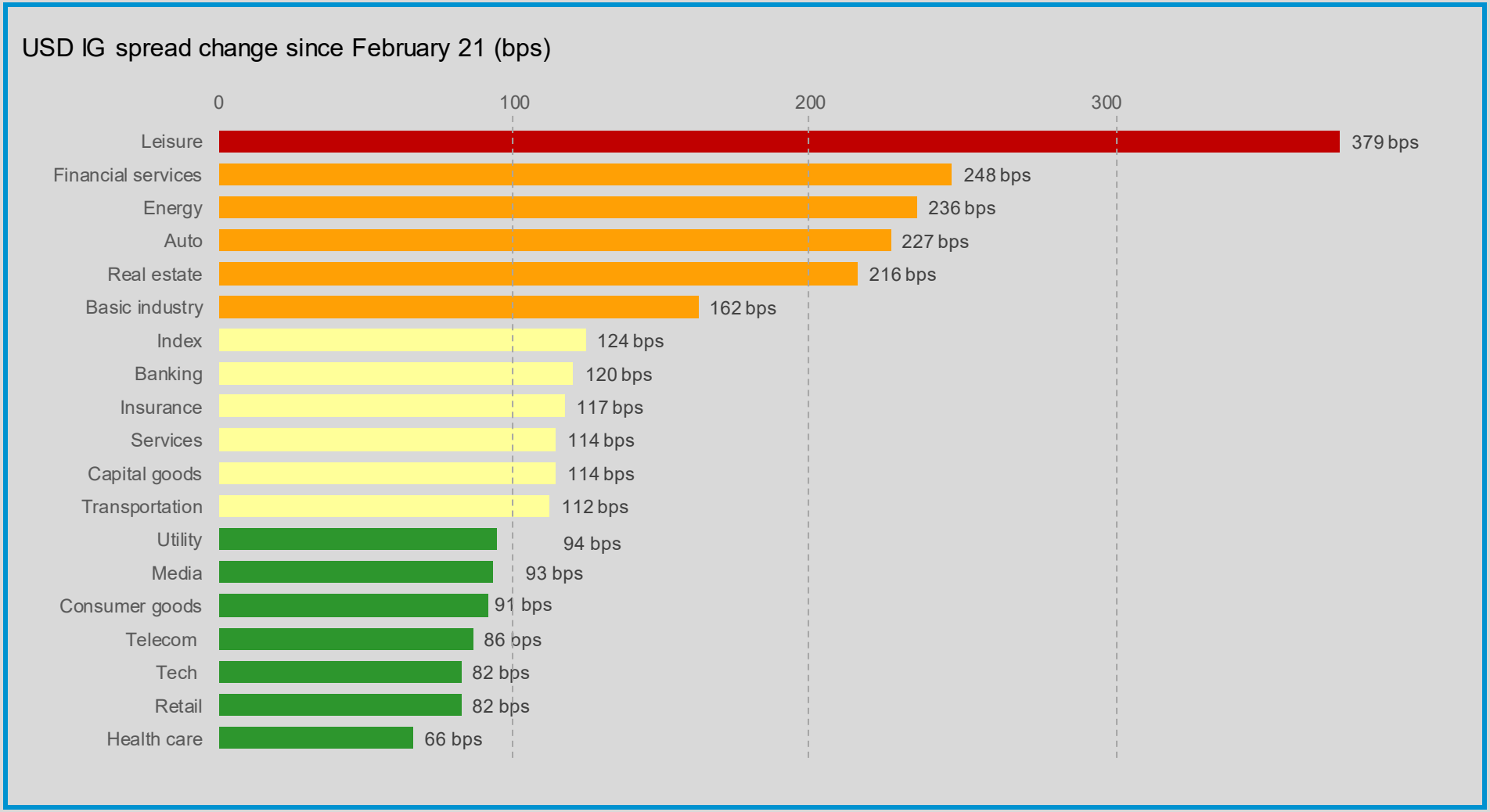
Category	Contact Intensity	# of Contacts
"Nonessential" Businesses		
Restaurants	Medium	Medium
Bars	High	High
Salons / spas	Medium/High	Low
Retailers	Low	Medium
Shopping malls	Low	Medium
Fitness centers	Medium	Medium
Theaters & museums	Medium	High
Large venues	High	High
Schools & Childcare Facilities		
Childcare facilities	High	Medium/High
Schools	High	High
Contact school sports	High	Medium/High
Noncontact school sports	Low	Medium
Summer camps	High	High
Higher education	High	High
Residence halls	High	Medium
Outdoor Spaces		
Parks / walking paths	Low	Low
Athletic fields	Medium	Medium
Pools	Medium	Low
Beaches	Low	High
Playgrounds	Medium	Medium

Category	Contact Intensity	# of Contacts
Community Gathering Spaces		
Places of worship	High	High
Libraries	Low	Low
Community centers	Medium	High
Transportation		
Buses	High	High
Metros / rail	High	High
Airplanes	High	High
Rideshare / taxis	High	Low
Mass Gatherings		
Sporting events	High	High
Sports training	High	Medium
Religious mass gatherings	High	High
Business mass gatherings	High	High
Concerts / festivals	High	High
Political rallies / polling centers	High	High
Interpersonal Gatherings		
Small social gatherings (birthday parties)	High	Medium
Large social gatherings (weddings)	High	High

Source: (1) Johns Hopkins, Bloomberg School of Public Health. "Public Health Principles for a Phased Re-opening During COVID-19: Guidance for Governors".

Credit Spread Widening by Industry

Industry sectors that are high beta to the economy's performance and discretionary consumer spending have been most adversely impacted in US corporate credit markets



Source: (1) CreditSights. Spread data through April 24, 2020. BofAML indices.

Re-Opening the Economy

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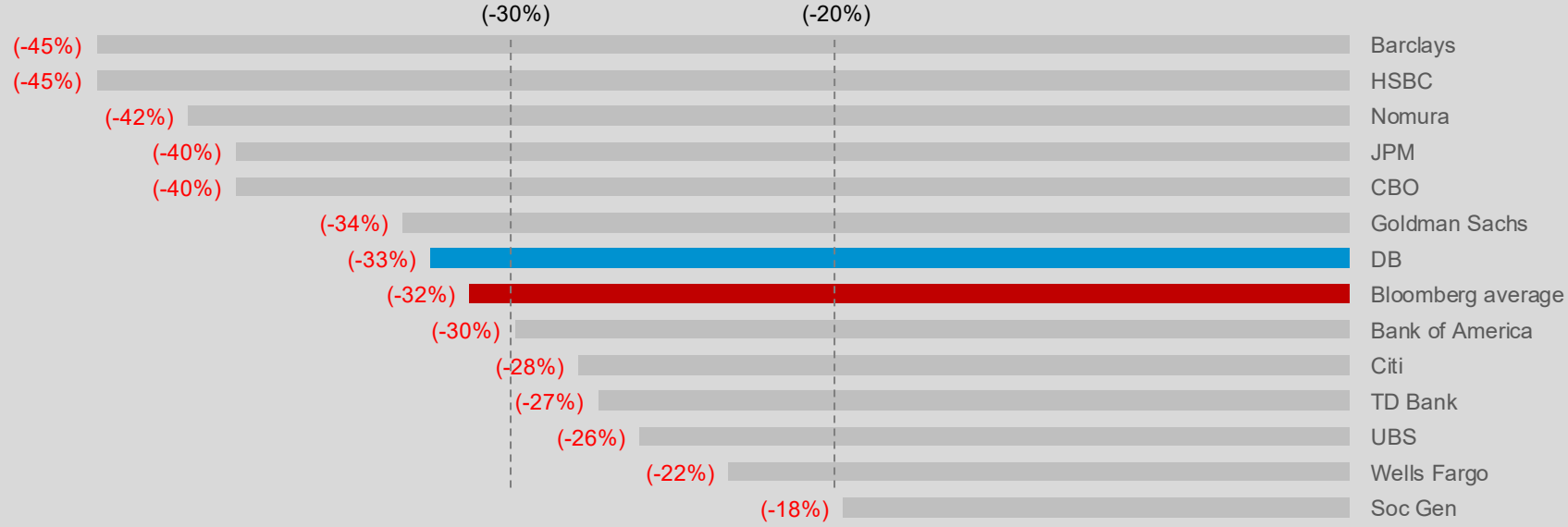
Historic US Q2 GDP Contraction

According to DB's US Economics Research team, US high frequency economic data has plunged as much as 25 standard deviations from average, the largest in a century. Similarly, consensus Q2 GDP forecasts of a 30-40% contraction are 3-4x the largest quarterly decline in the modern era. Baseline expectations for the 2H are for just a 40% recovery of lost output, with a full recovery not expected until between late 2021 and early 2023, depending on virus severity.

Largest quarterly US GDP declines since WWII, prior to COVID-19

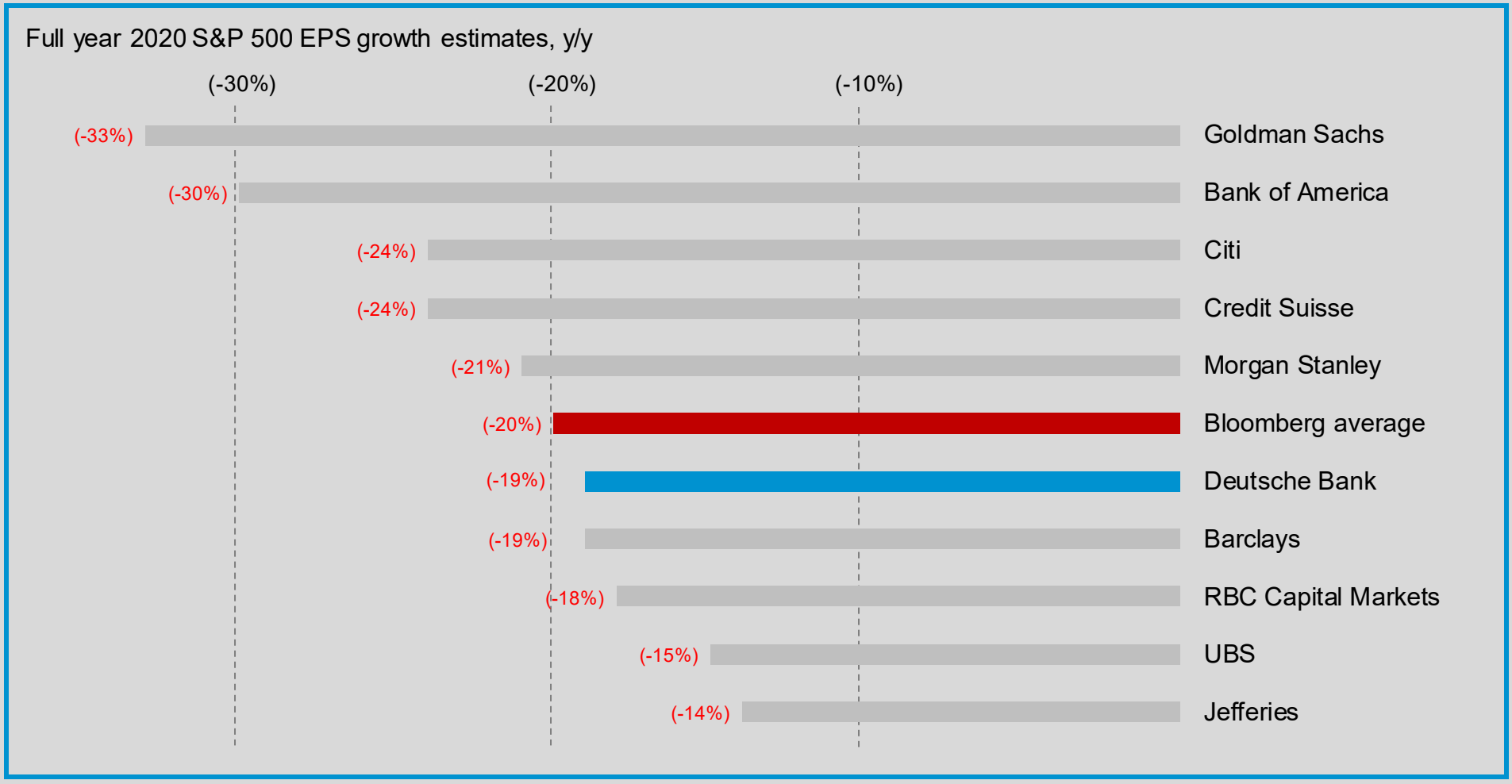
Q2 US GDP forecast (% q/q, annualized)



Source: (1-2) Bloomberg. Data as of April 28, 2020. CBO is Congressional Budget Office.

Selected 2020 S&P 500 Earnings Estimates

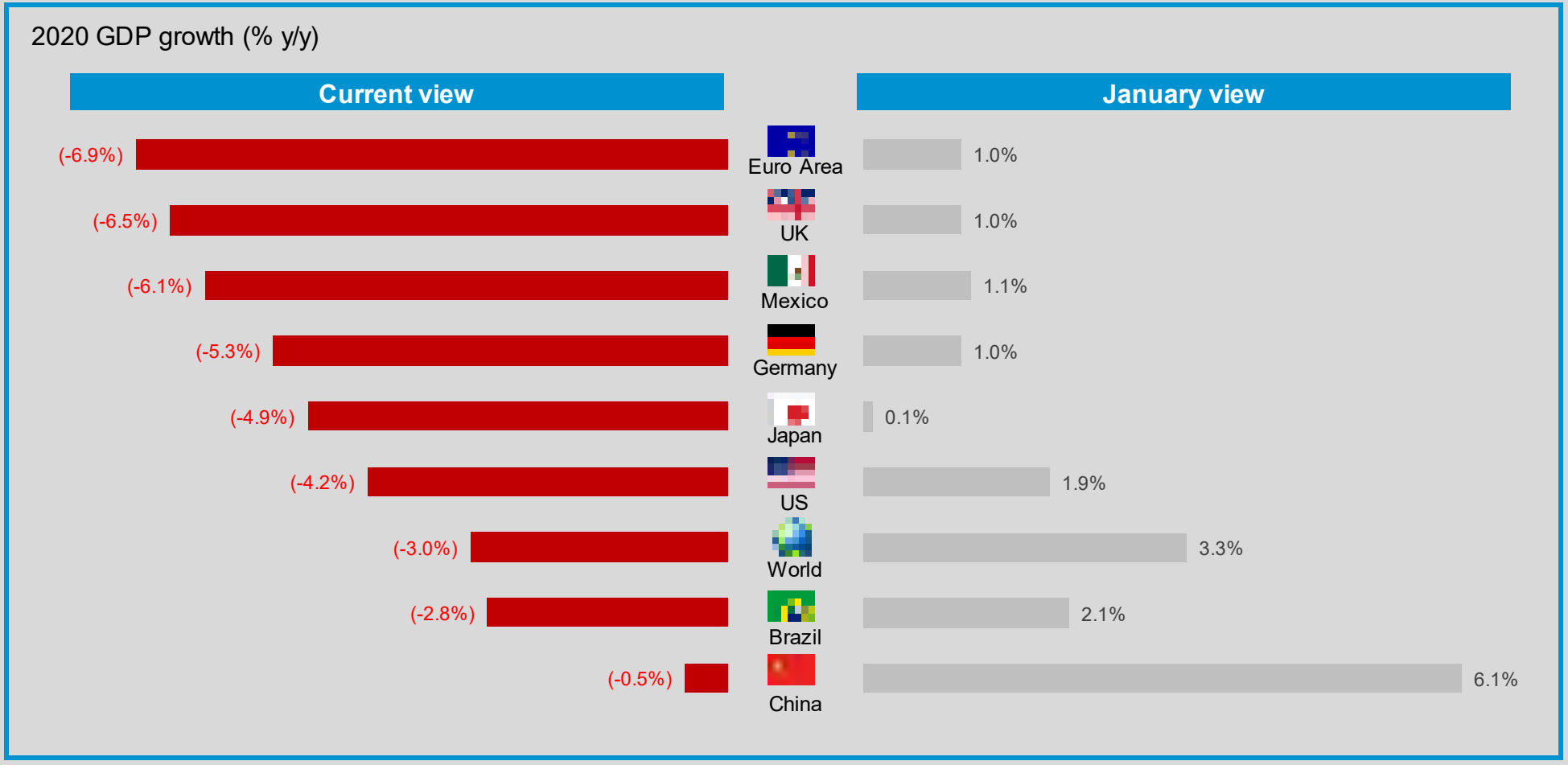
With visibility on earnings exceptionally low, over 75% of S&P 500 companies have already suspended guidance. Consensus earnings forecasts for full year 2020 have also declined sharply from +9% in January to (-20%) today, with many projecting even sharper declines. On a more granular level, sector differentiation remains high, with technology and defensive industries strongly outperforming cyclicals and energy.



Source: (1) Bloomberg. Data as of April 28, 2020. DB Global Markets Research (Chadha).

The “Mandated” Global Recession

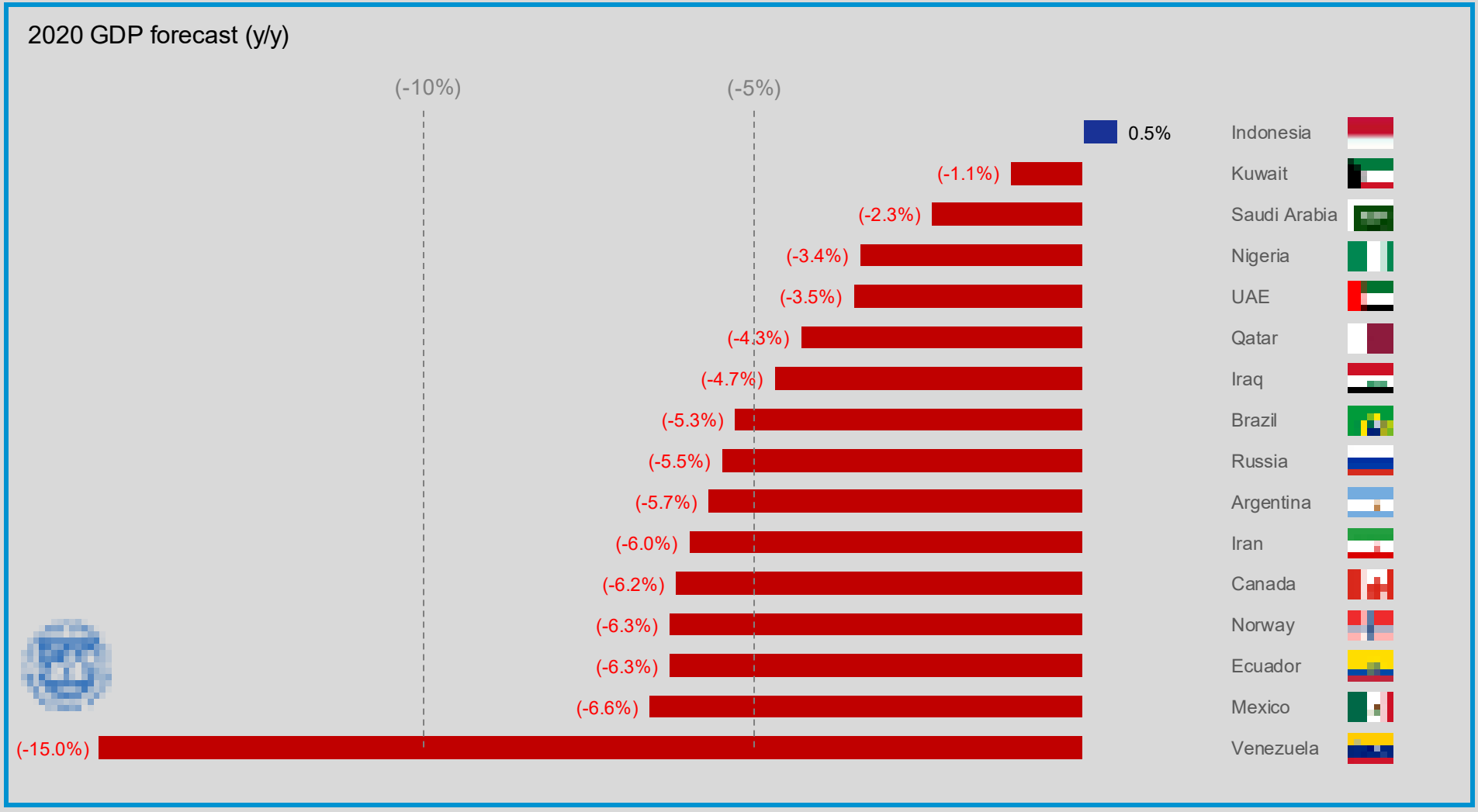
The global economy entered this COVID-19 period vulnerable after the US-China trade war with global growth only 3% by year end, and 23 major economies in a manufacturing recession last summer. With a low starting point, the “Great Lockdown” recession is expected to be the steepest in almost a century, and only the 5th global recession in the post WWII period. The IMF is forecasting a (-3%) contraction in global growth in 2020, much sharper than the (-0.1%) decline during the 2008 financial crisis.



Source: (1) DB Global Markets Research “Impact of Covid-19 on the global economy: Beyond the abyss” (David Folkerts-Landau). “US outlook update: Quantifying the know n unknow ns” (Luzzetti, Ryan, Weidner). World GDP forecast is from IMF.

Outsized GDP Contraction for Large Oil Producers

The dual shock of oil's decline will have an outsized impact on the fiscal balances and rate of GDP contraction for larger oil producing nations in particular, especially in EM.



Source: (1) IMF.

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Small Business & the "Crisis from the Bottom"

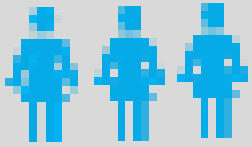
The COVID-19 virus and the "economics of stoppage" have created a "crisis from the bottom" for the 30 million small and medium sized businesses that employ over 130mm in the US alone. Scalability therefore becomes a core challenge of the policy response, as does the viability of many business models, even with Government support.

# of small businesses in the US

30 million

# of women-owned businesses in the US

12 million



# of restaurants in the US

>1 million

% of US employment by small business

48%

% of US employment by small & medium sized business

83%

Total annual sales of US small business

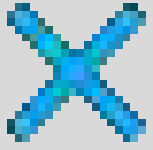
$8.8 trillion

% of US corporate revenue from small & medium business

50%

# of US businesses that fail annually (1,600 / day)

600k



# of US businesses created annually (1,500 / day)

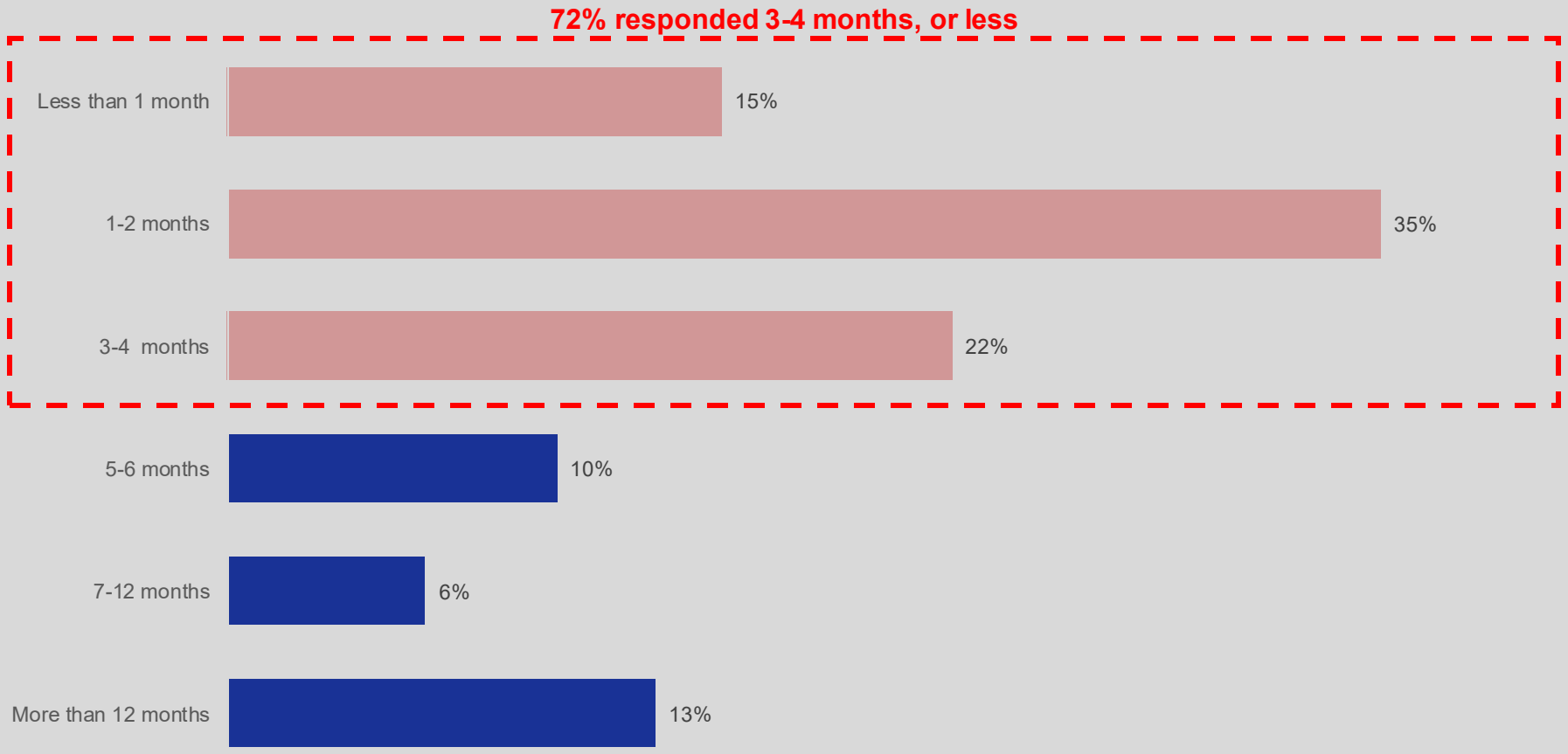
550k

Source: Small Business Administration. Statista. DB Markets Research (Torsten Slok).

US Small Businesses Vulnerable to Shutdown

A March survey by the National Federation of Independent Business (NFIB) showed that half of the US's small businesses don't expect to be able to survive under current economic conditions for more than two months

How long will you be able to operate under current economic conditions?

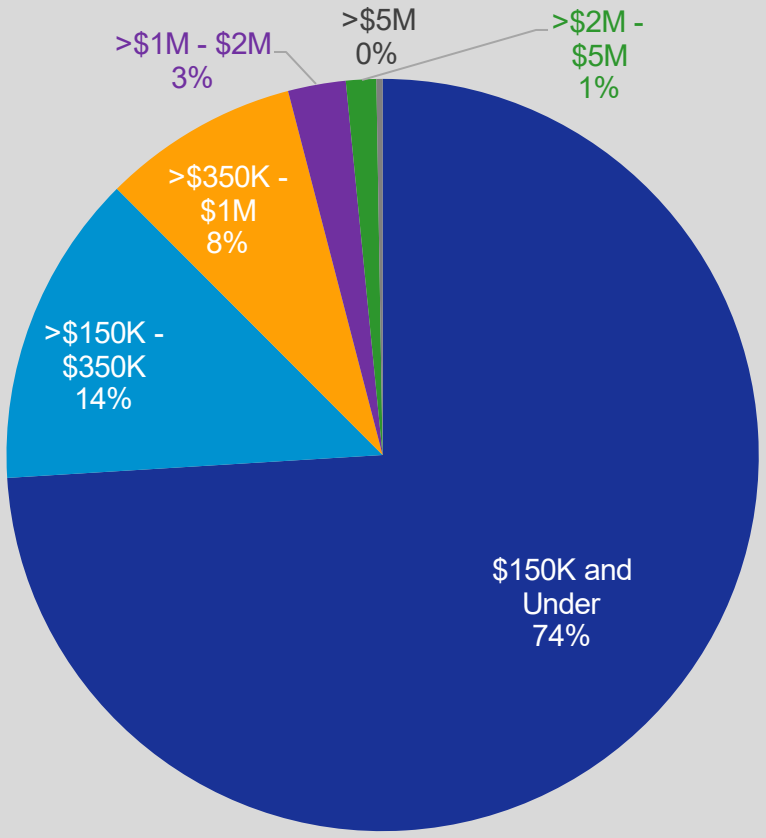


Source: (1) Bloomberg. NFIB March 30 survey of 627 firms.

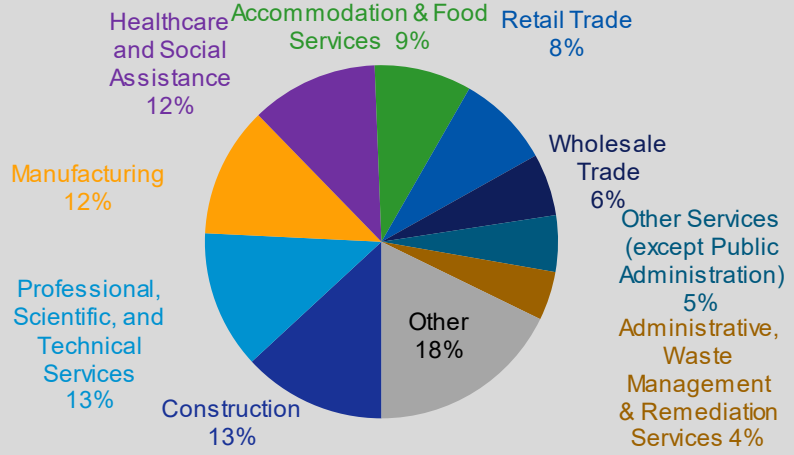
$729 Bn Aid for Small Businesses

More than half of the $729 Bn allocated to relief for small businesses in the US fiscal stimulus plans has been allocated. Similar to other programs, scalability and slow processing remain formidable challenges.

Number of approved PPP loans by loan size



PPP loan dollars by sector

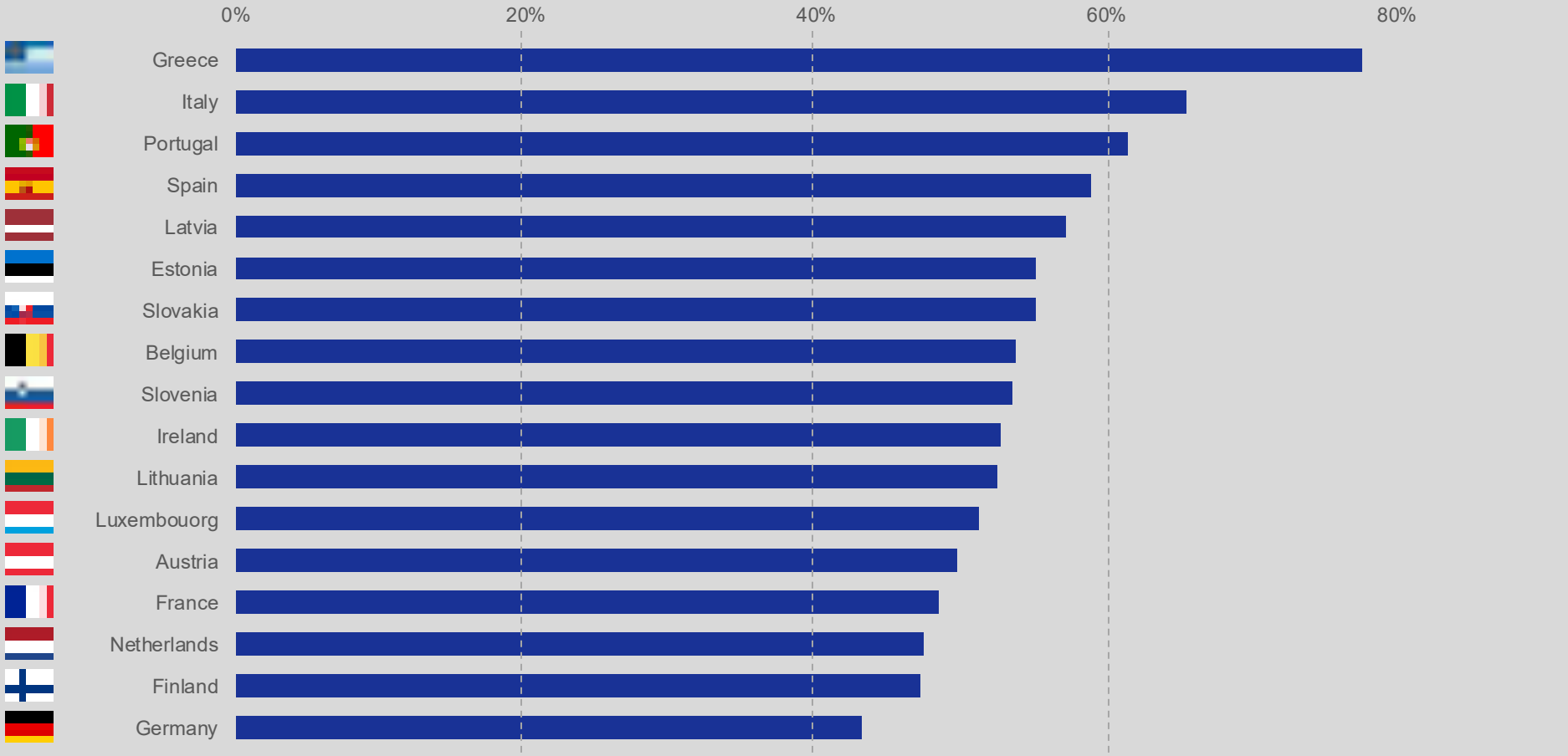


Other – Sectors under 4%	
Real Estate and Rental and Leasing	3.1%
Transportation and Warehousing	3.1%
Finance and Insurance	2.4%
Educational Services	2.4%
Information	2.0%
Arts, Entertainment, and Recreation	1.4%
Agriculture, Forestry, Fishing and Hunting	1.3%
Mining	1.1%
Management of Companies and Enterprises	0.3%
Public Administration	0.3%
Utilities	0.3%

Source: (1) US Small Business Administration "Paycheck Protection Program (PPP) Report – Approvals through 4/16/2020". (2) US Small Business Administration "Paycheck Protection Program (PPP) Report – Approvals through 4/16/2020".

Europe's Vulnerable Labor Market Structure

Numerous countries across Southern Europe have a more vulnerable labor market structure, by virtue of both higher dependence on tourism, as well as the smaller average size of companies driving employment



Source: FT. Moodys "Coronavirus' lasting credit impact will depend on crisis duration and fiscal exit strategies."

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The Fed's 2020 Crisis Playbook

Leveraging the 2008-9 playbook, the Fed's policy response has been swift and comprehensive in alleviating market dislocations and restoring functionality to markets. The Fed, however, cannot fight the virus, and cannot create demand.

Easing Financial Conditions | Addressing Market Dislocations | Restoring Funding Markets

Emergency interest rate cut
Fed Funds Rate to 0% lower bound

Bank repo facilities
Current estimated capacity around $3 trillion

Lower bank reserve requirements
Cut to 0%

Revised discount window terms
25 bps, 90 days

Primary Dealer Credit Facility
Discount Window rate, up to 90 days

Paycheck Protection Program Liquidity Facility
Eligible collateral of up to $659 bn from PPP loans

Unlimited Quantitative Easing
Over $1 trillion UST and $250 billion MBS purchases in April

Central Bank swap lines
14 global central banks at reduced rates and extended terms

US Dollar repo facility
US Dollar liquidity for USD $3 trillion of foreign CB UST holdings

Money Market Mutual Fund Liquidity Facility
Eligible size of potential purchases around $700 billion

Commercial Paper Funding Facility
Eligible size of potential market estimated at over $1 trillion

Main Street Business Lending Program
Up to $600 bn in lending

Primary Market Corporate Credit Facility
Up to $500 bn new financing

Secondary Market Corporate Credit Facility
Up to $250 bn new financing

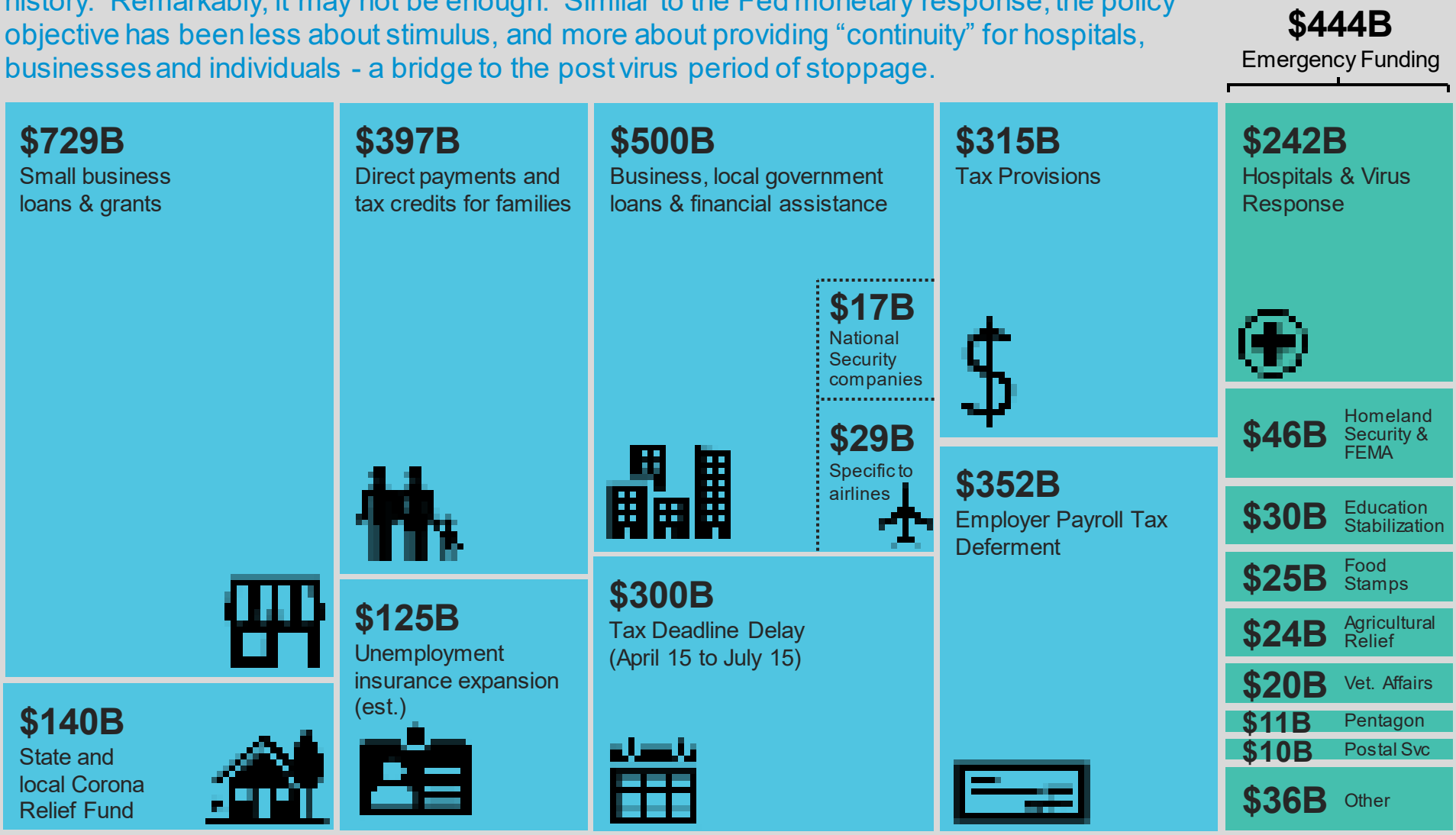
Term Asset-Backed Securities Loan Facility
Up to $100 bn new financing

Municipal Liquidity Facility
Up to $500 bn in lending

Source: Federal Reserve

Record $3.3 Trillion US Fiscal Stimulus

At roughly 15% of GDP, the $3.3 trillion US fiscal response to COVID-19 has been the largest in history. Remarkably, it may not be enough. Similar to the Fed monetary response, the policy objective has been less about stimulus, and more about providing "continuity" for hospitals, businesses and individuals - a bridge to the post virus period of stoppage.



Source: DB Global Markets Research (Ryan, Luzzetti, Weidner. "Higher debt is a necessary price to pay"; "What's in the $2 trillion stimulus package?"). US Senate, Committee for a Responsible Federal Budget, Bloomberg Research

Consumer Psyche & Change

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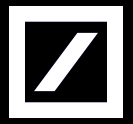


"Few people realize the immensity of vacancy in which the dust of the universe swims."

H.G. Wells, prolific English author, in The War of the Worlds (1897)

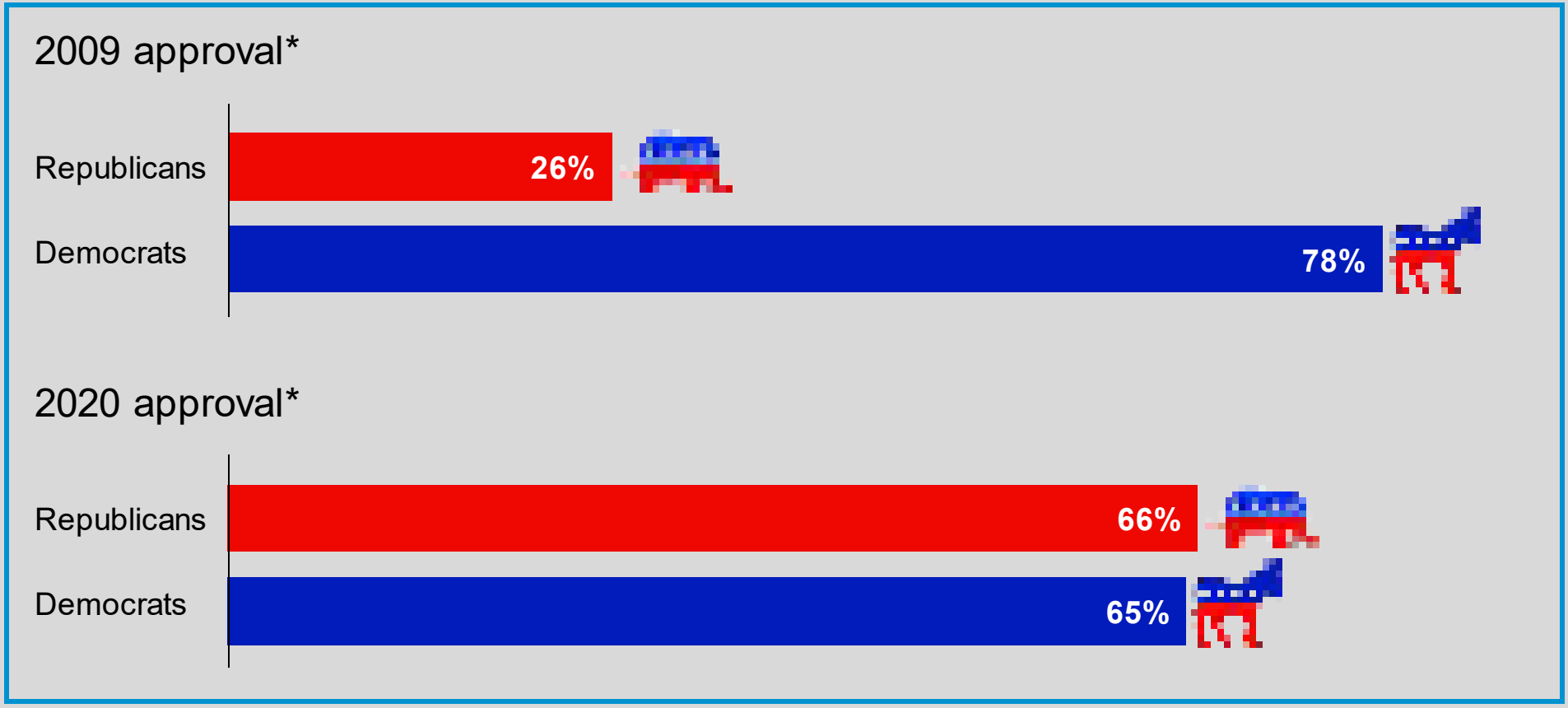
Consumer Psyche & Change

- Fear & Public Opinion
- Unemployment Scars
- Discretionary Spending Pullback
- Rising Savings Rate
- The Contact Free Economy

Higher Tolerance for Government Support

Unlike the 2009 financial crisis, bipartisan support is much more aligned with a greater role of Government in the COVID-19 crisis response. In addition to being an economic crisis "from the bottom" as opposed to a "Wall Street bailout," the moral imperatives of an expanded Government role during a health crisis are more clear.

Support for US Government Role in Crisis Response (2009 & 2020)

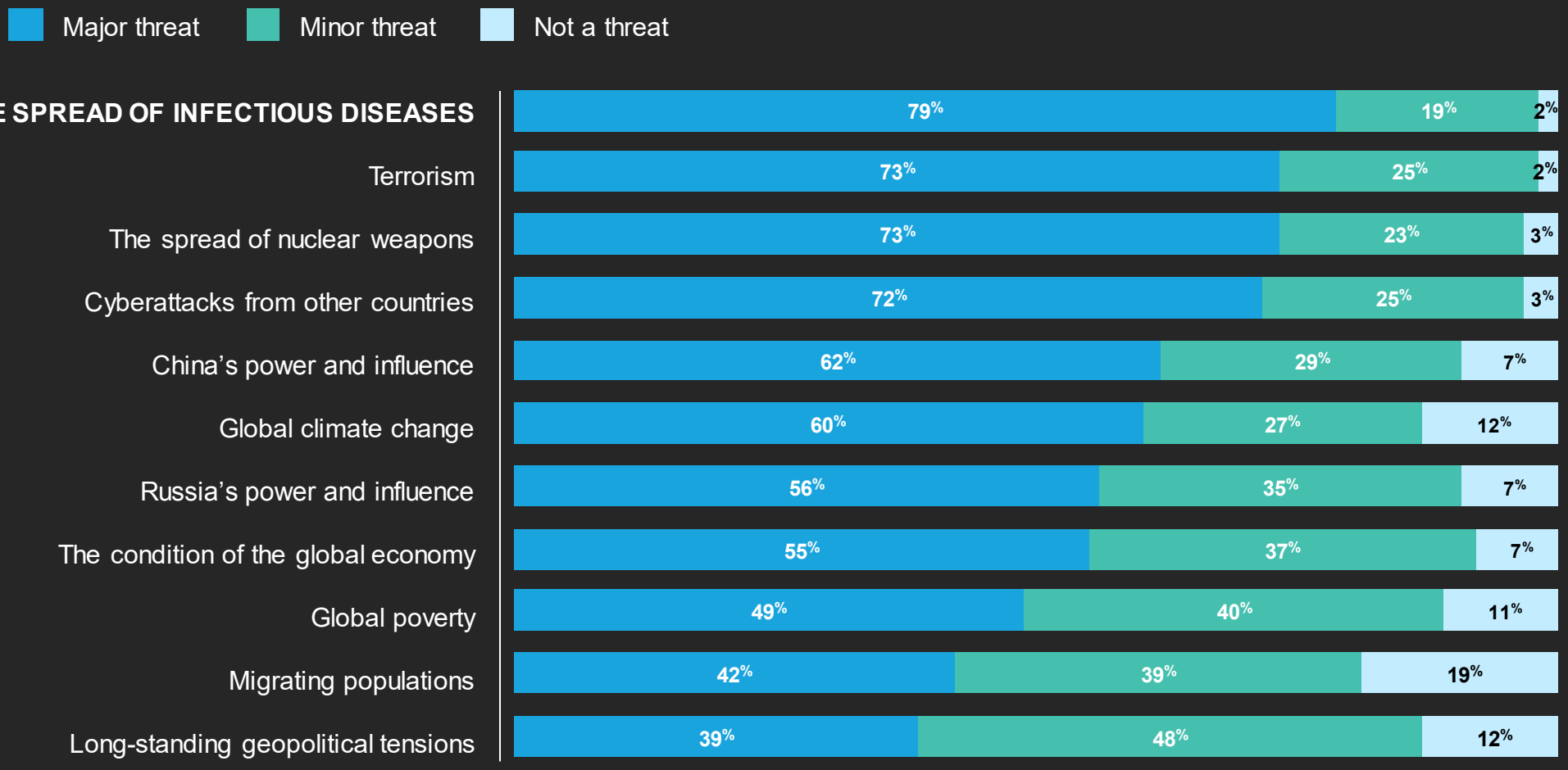


Source: *March 2009 Gallop Poll. WSJ/NBC News telephone poll of 900 registered voters conducted from April 13-15; margin of error +/-3.27 pct. pts.

Infectious Disease Spread a Top Concern for Americans

In the wake of the COVID-19 outbreak, a new pew research poll found that Americans ranked the spread of infectious diseases as the top international threat to the United States

% who say __ is a major threat, minor threat, or not a threat to the United States

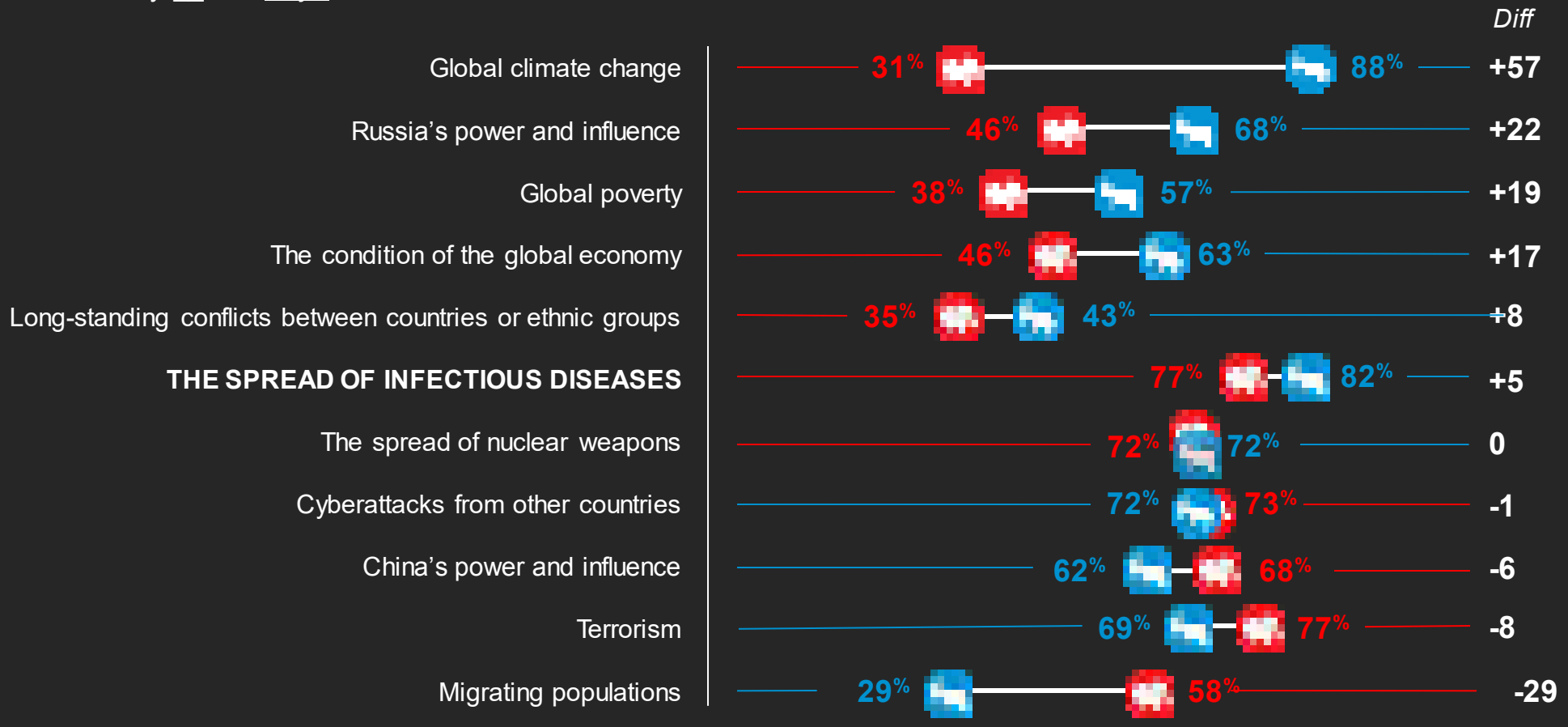


Source: Pew Research "Americans See Spread of Disease as Top International Threat, Along With Terrorism, Nuclear Weapons, Cyberattacks". Pew Research Study conducted betw een March 3 and March 29, 2020.

Democrats and Republicans Similarly Concerned on Infectious Disease Spread

While Democrats show more worry on climate change and Russia, and Republicans exhibit higher concern on immigration, the threat posed by the spread of infectious disease is a rare point of agreement for both Republicans and Democrats

% who say __ is a major threat to the United States



Source: Pew Research "Americans See Spread of Disease as Top International Threat, Along With Terrorism, Nuclear Weapons, Cyberattacks". Pew Research Study conducted betw een March 3 and March 29, 2020.

Consumer Psyche & Change

Fear & Public Opinion

Unemployment Scars

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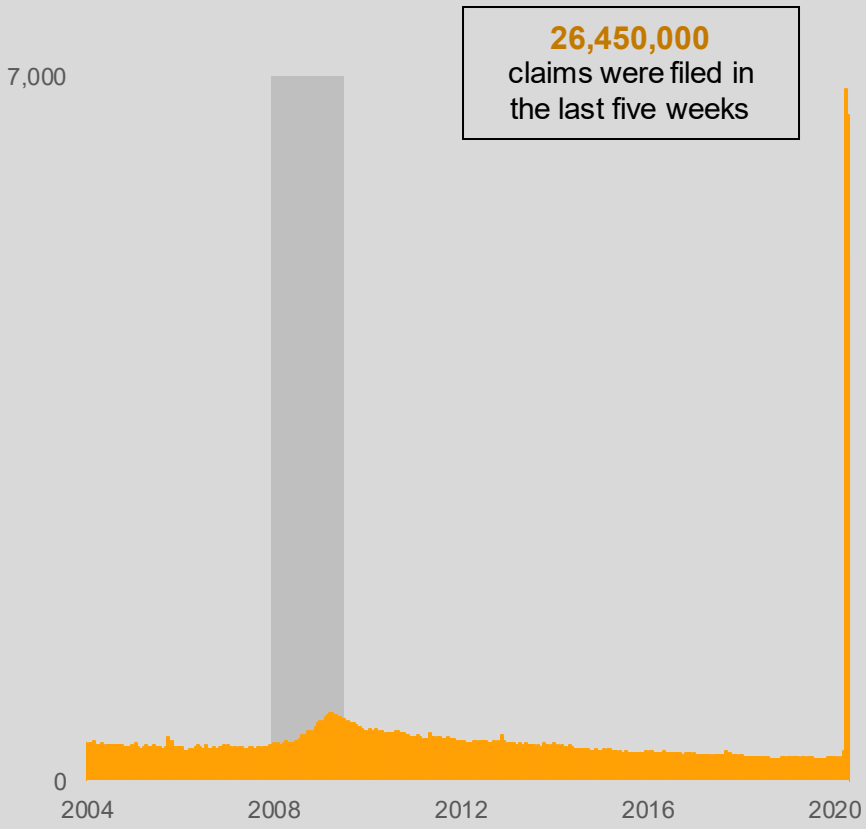
Historic Rise in Unemployment

With over 26 million new jobless claims, the US has undone the job creation of the entire post crisis decade in just 5 weeks. For perspective, DB and consensus forecasts for peak US unemployment in Q2 are in the 17-20% area, nearly double the highest US unemployment rate of the post WWII era (which was just over 10% in 2009).

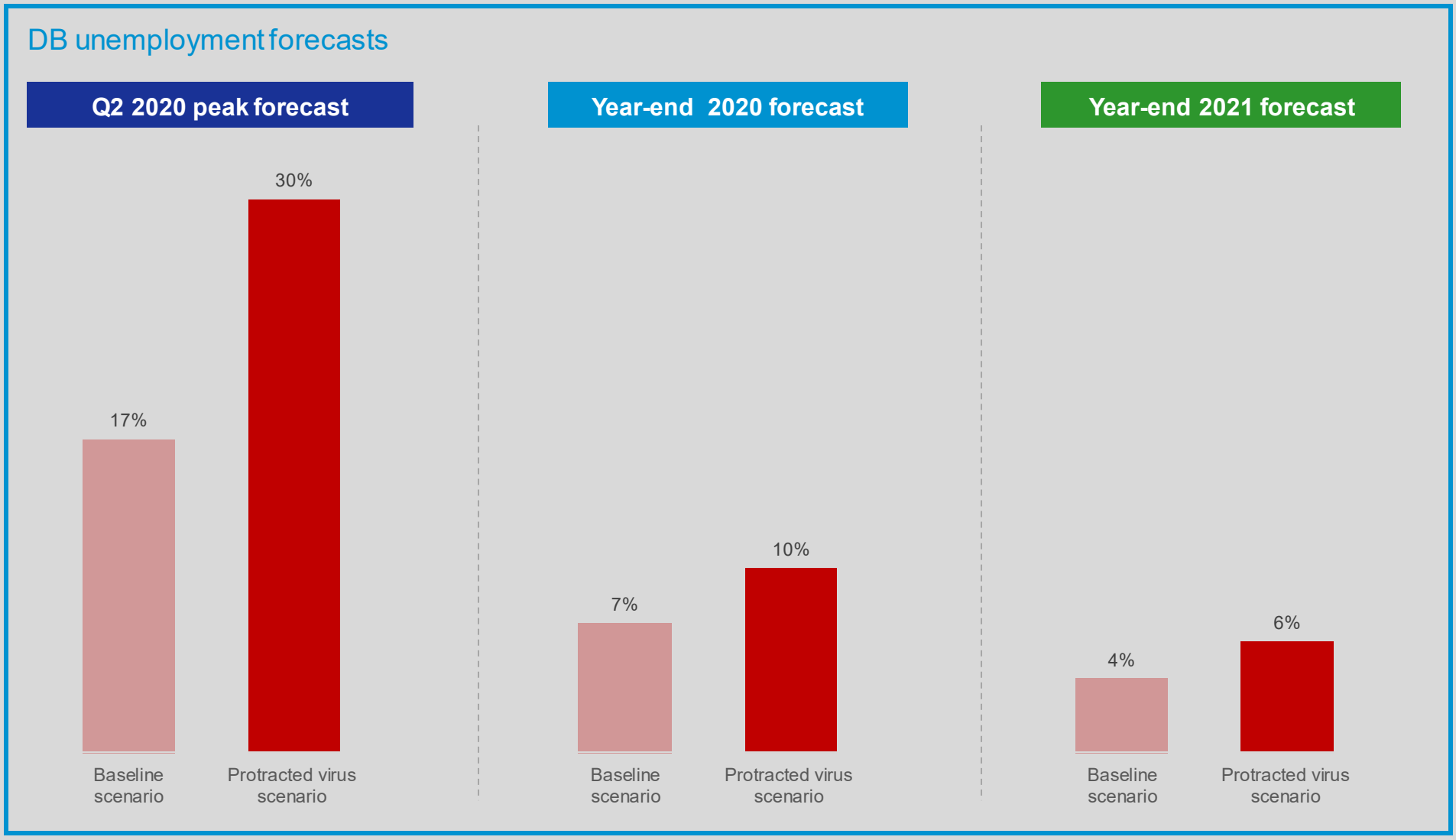
Weekly jobless claims, 1,000s



Job losses

Source: (1) Bloomberg. Data as of April 28, 2020. (2) Department of Labor. Bureau of Labor Statistics.

DB Baseline & Tail Risk Unemployment Projections

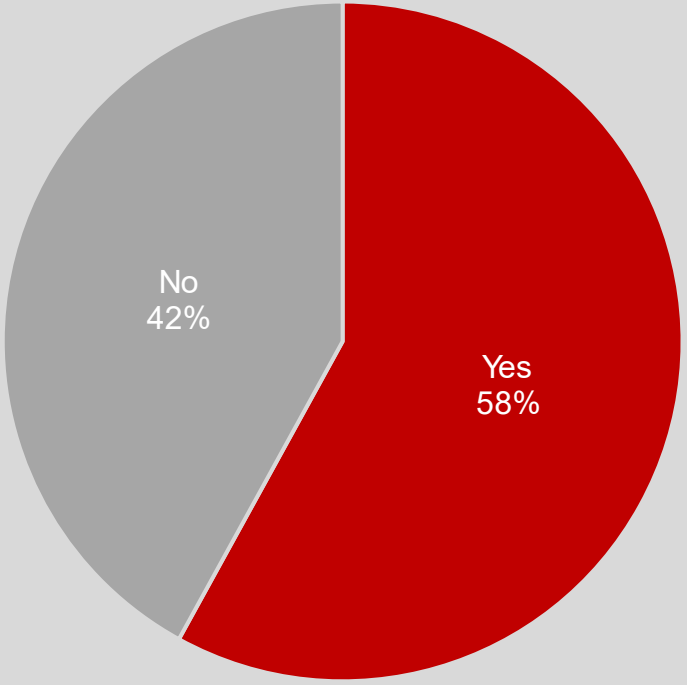


Source: (1) DB Global Markets Research (Luzzetti, Ryan, Weidner).

Small Business Layoffs

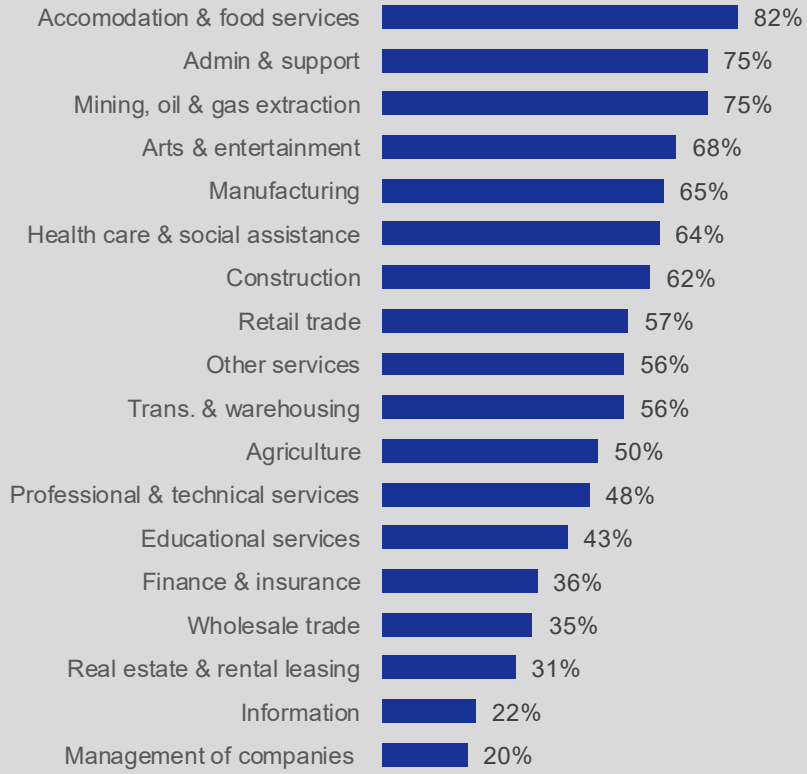
According to a Lending Tree Survey, 58% of small businesses have laid off employees due to coronavirus-related circumstances

Have you laid off any employees due to coronavirus-related circumstances?



Small business layoffs have occurred across most major industries with accommodation and food services hit the hardest

Percentage of small business owners who laid off employees due to coronavirus-related circumstances (by industry)



Source: (1-2) LendingTree survey of 1,260 small business ow ners.

Consumer Psyche & Change

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Unemployment Scars

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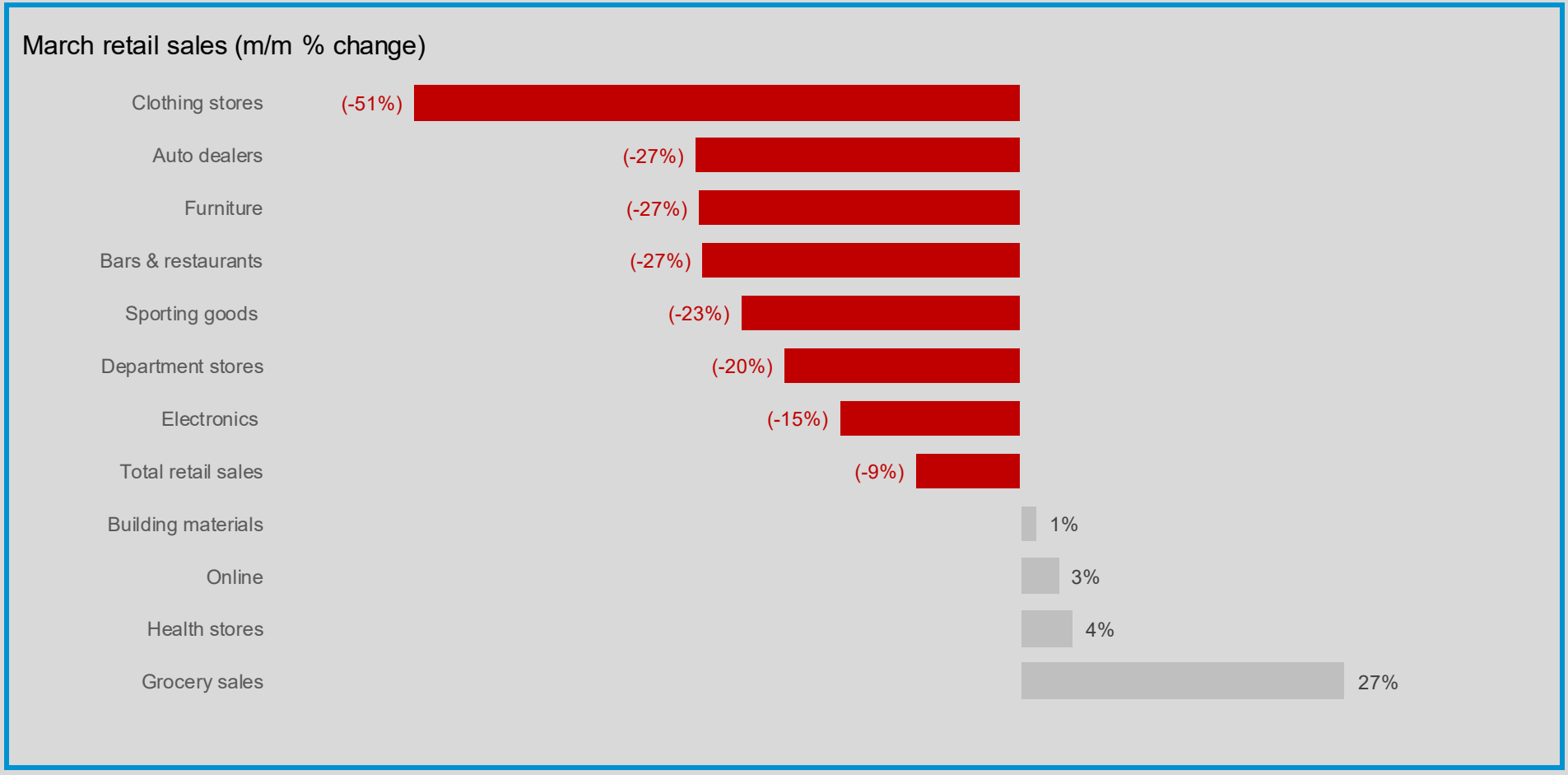
Rising Savings Rate

The Contact Free Economy

March Retail Sales: Largest Monthly Decline

Despite frontloading of essential purchases ahead of lockdown orders, Retail Sales fell nearly 9% in March, their worst decline on record. With nearly 90% of the US under some form of social distancing order and non-essential businesses forced to close, the sharp decline in discretionary purchases far outweighed the rise in demand for essential goods.

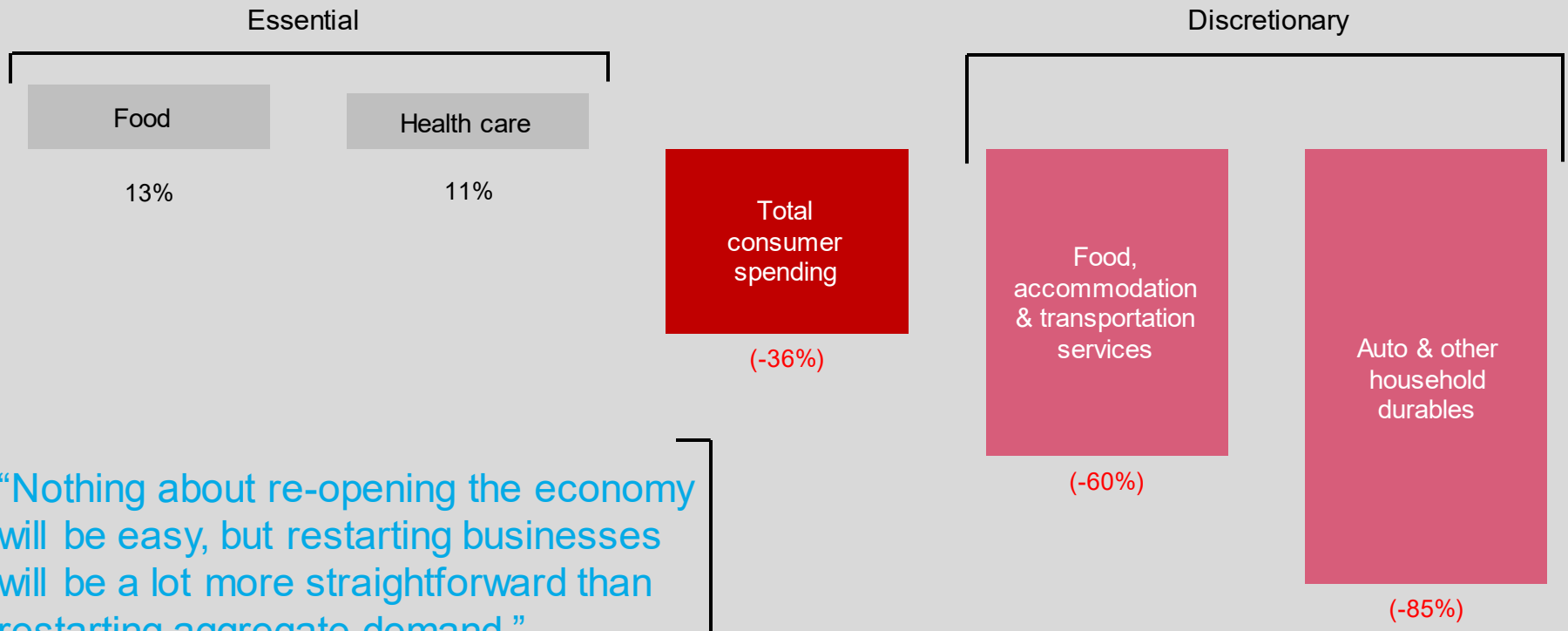


Source: (1) Commerce Department. Seasonally adjusted.

Q2 Consumer Spending Projections

While US consumer spending is expected to decline in Q2 at the highest rate on record, there is significant variance between "essential" and "discretionary" spending.

DB Q2 US consumer spending forecast (q/q, annualized)



"Nothing about re-opening the economy will be easy, but restarting businesses will be a lot more straightforward than restarting aggregate demand."
Mark Zandi, Moody's Chief US Economist

Source: (1) DB Global Markets Research (Luzzetti).

Consumer Psyche & Change

Fear & Public Opinion

Unemployment Scars

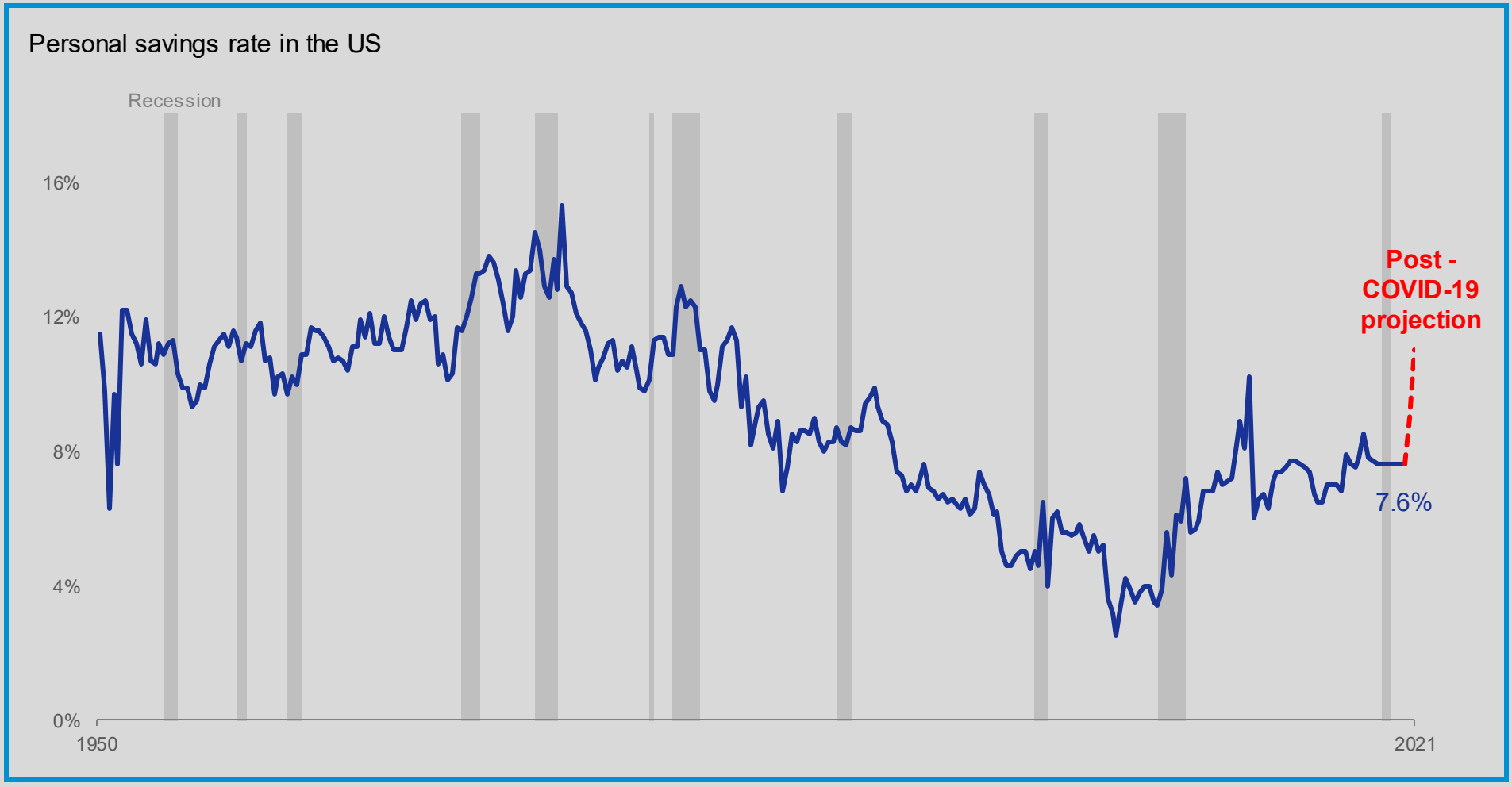
Discretionary Spending Pullback

Rising Savings Rate

The Contact Free Economy

The Savings Rate Increases After Recessions

Historically, US savings rates typically increase approximately 2%, but could rise 3% this time to 11% area. This, in turn, could impact as much as $500bn of growth in the US economy in 2021.



Source: (1) DB Global Markets Research (Slok, Weidner). FRED. US Census. BEA.

Consumer Psyche & Change

Fear & Public Opinion

Unemployment Scars

Discretionary Spending Pullback

Rising Savings Rate

The Contact Free Economy

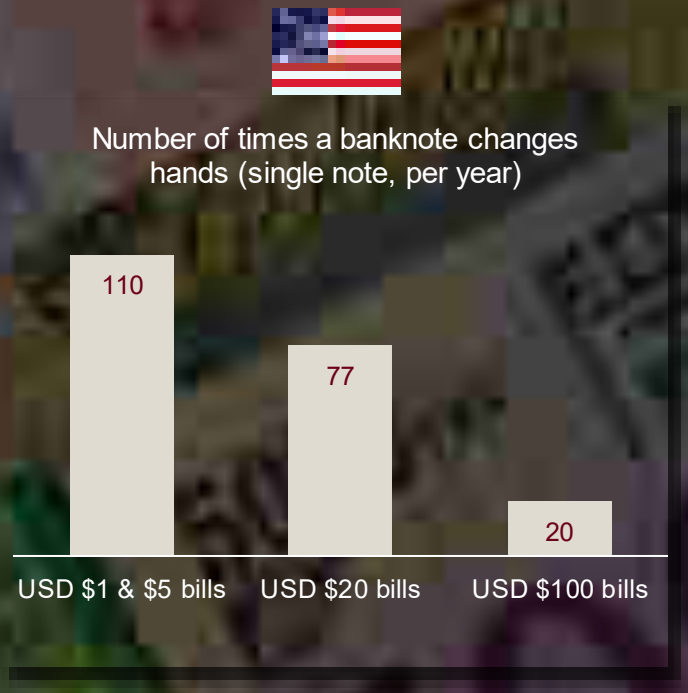
Contact Free Economy

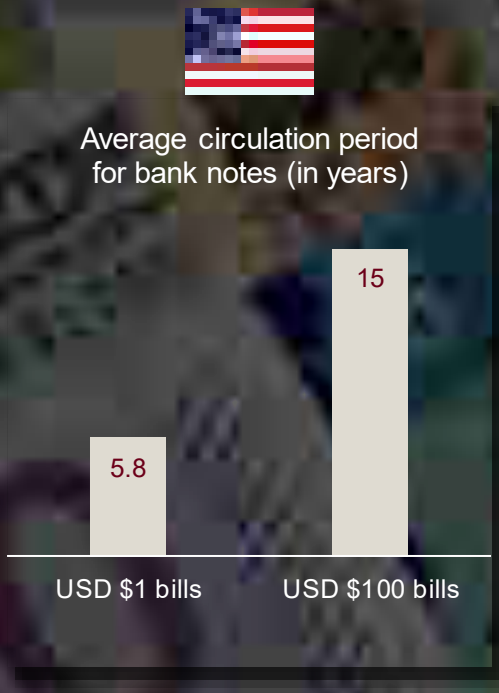
- Acceleration of personal technology adoption across age groups
- Acceleration of digital e-commerce trends
- More rapid adoption of digital payment technologies (less cash)
- Videoconference over audio and in-person alternatives
- Slow return to airline travel; rise of digital "experiences"
- More remote "work from home"
- Remote, computer-based learning gains on institutional platforms (i.e., universities)
- Virtual health and video-enabled fitness
- Proliferation of technology enabled, on-demand services
- Rise of telemedicine
  - Cost and speed advantages, with high quality
  - Point-of-care diagnostics
  - Connecting systems, automation and AI

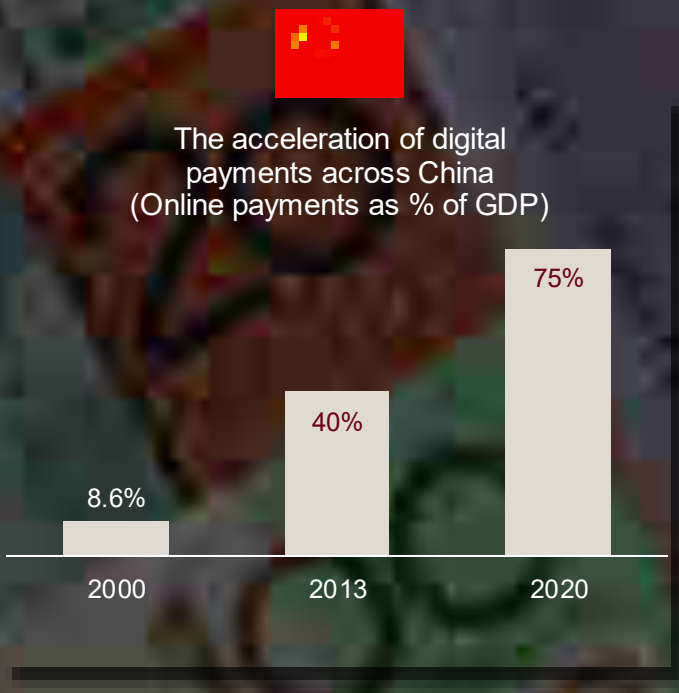
Source: DB Capital Markets Strategy. McKinsey Institute, BCG, Deloitte, PWC, Brookings Institute, Council of Foreign Relations

The Acceleration Toward Digital Payment Systems

An interesting new report by DB Research Analyst Marion Laboure highlights the risk of virus transmission through physical currency use. Notably, human influenza virus has been found alive and infectious on banknotes for up to 17 days. To this end, China went so far as to destroy bank notes circulating in high risk areas for the COVID-19 virus. Looking ahead, COVID-19 global contagion may be the catalyst that drives acceleration in the US and Europe toward digital payment systems.

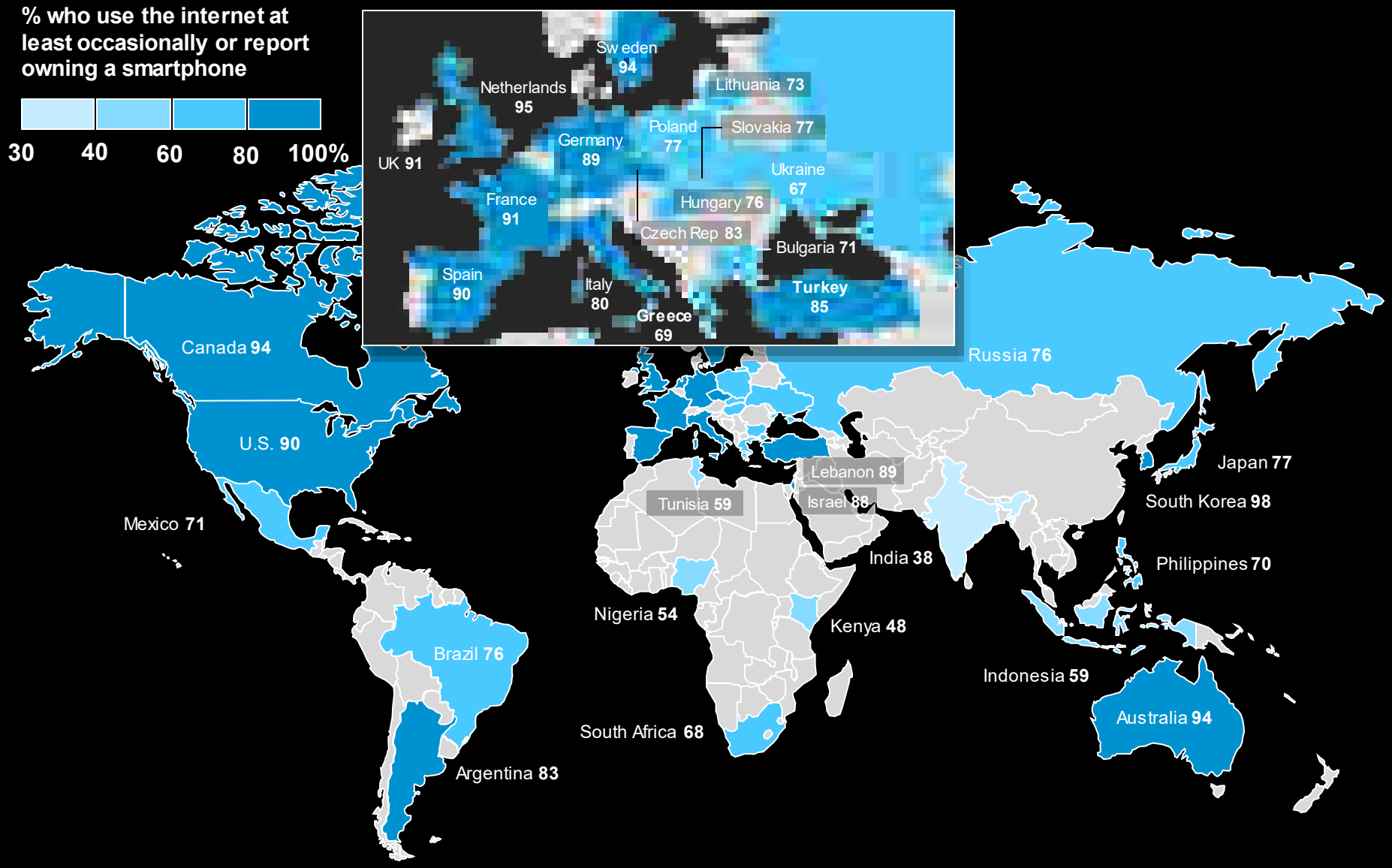






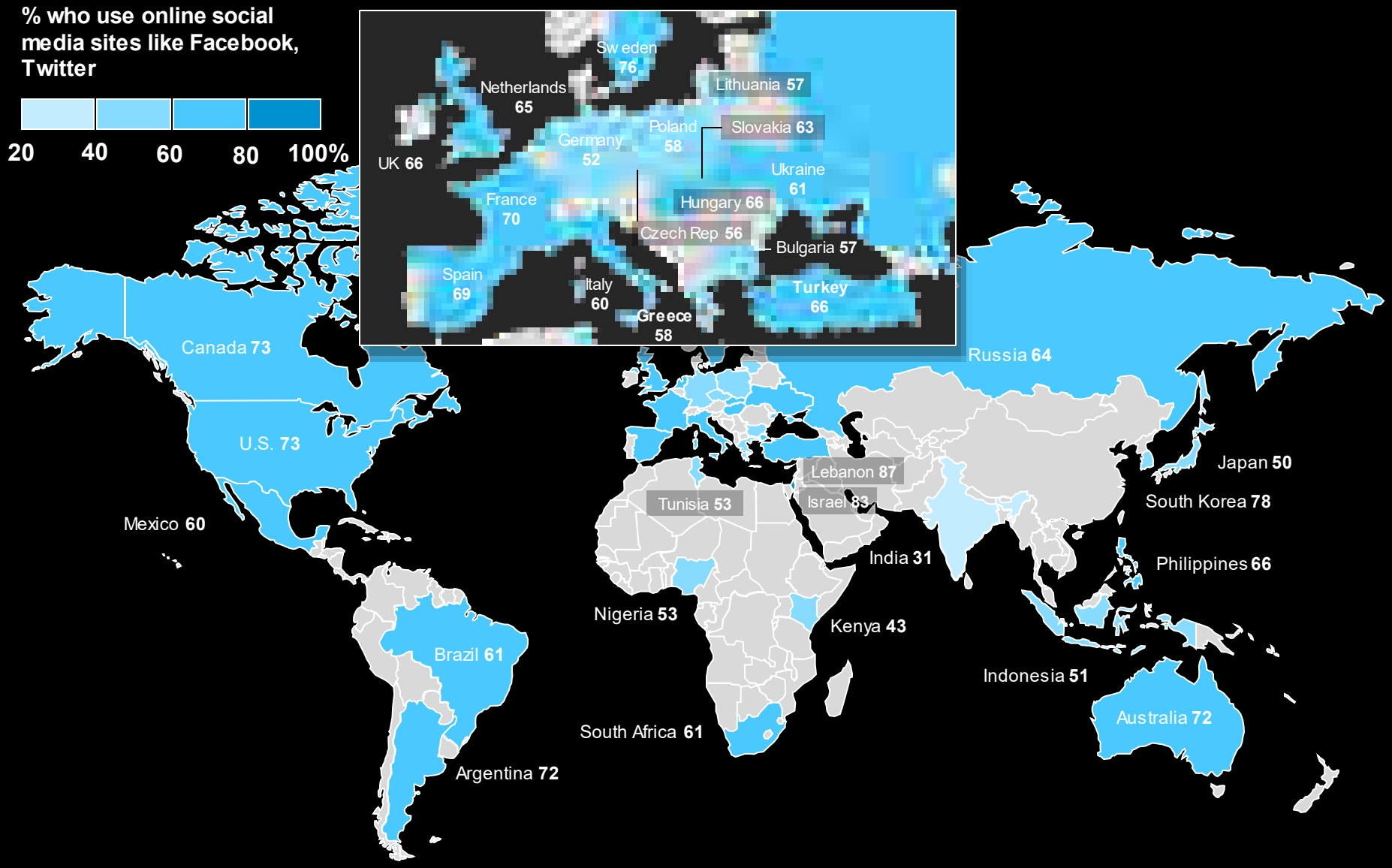
Source: Federal Reserve. US Treasury. DB Global Markets Research (Marion Laboure: "Infectious Cash & Digital Payments", March 5, 2020).

% of Population Using Internet



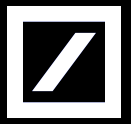
Source: Pew Research Center, April 2, 2020. Spring 2019 Global Attitudes Survey. Q51 & 53. U.S. data is from a Pew Research Center survey conducted Jan 8-Feb 7, 2019.

% of Population Using Social Media



Source: Pew Research Center, April 2, 2020. Spring 2019 Global Attitudes Survey. Q54.

New World Order



"These days everyone has the same data about the present, and the same ignorance regarding the future."

Howard Marks, Co-Founder & Co-Chairman of Oaktree Capital Management

New World Order

- Human Behavior Changes
- Corporate Behavior Changes
- Geopolitical Rebalancing
- Navigating the Unknowns
- Impact on the 2020 Election

Human Behavioral Changes

More rapid technology adoption and digitization

- Payment technologies
- E-commerce
- Virtual experiences and communication
- Remote work and learning
- Support for “on-demand” service sector (“demand to door”)

Increased consumer caution

- Essential purchases over discretionary (especially near term)
- Rising savings rates (2-3% higher typical for recession)
- Higher healthcare and insurance premiums and costs
- Possible slowdown in urbanization trends

More demands on government and public sector regarding:

- Social safety net
- Healthcare reform
- Labor protections

More tolerance of government incursion in the economy

- Increased regulation and private sector influence
- Privacy tradeoffs for health security
- Health and technology based surveillance
- Potential mandatory testing and vaccinations

Rise of virus-free credentials at point of entry

- Conditionality for entrance (buildings, airports, public spaces)
- Digitally enabled immunity passports
- Digitally enable virus testing results
- Contact tracing and surveillance
- Body temperature testing and recording apps

Emergence of new employer-employee social contracts

- Remote working frameworks and guidelines
- Technology enabled organizational behavior
- Regulation and workers’ rights

Rising inequality and political feedback loops

- Impact of COVID-19 on lower skilled jobs
- Impact of rising automation and digitization
- Digitally driven economic and education systems

Source: DB Capital Markets Strategy, McKinsey Institute, BCG, Deloitte, PWC, Brookings Institute, Council of Foreign Relations

New World Order

Human Behavior Changes

Corporate Behavior Changes

Geopolitical Rebalancing

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Impact on the 2020 Election

Corporate Behavior Changes

Rise of "stakeholder capitalism"

- Acceleration of ESG rebalancing to employees and customers
- Focus on the "triple bottom line": profit, people and planet
- Resilience as a more important ESG factor
- Downward pressure on buybacks and dividends
- Community and employee investment priorities
- More attention to healthcare needs

"Resilience" as an elevated strategic priority

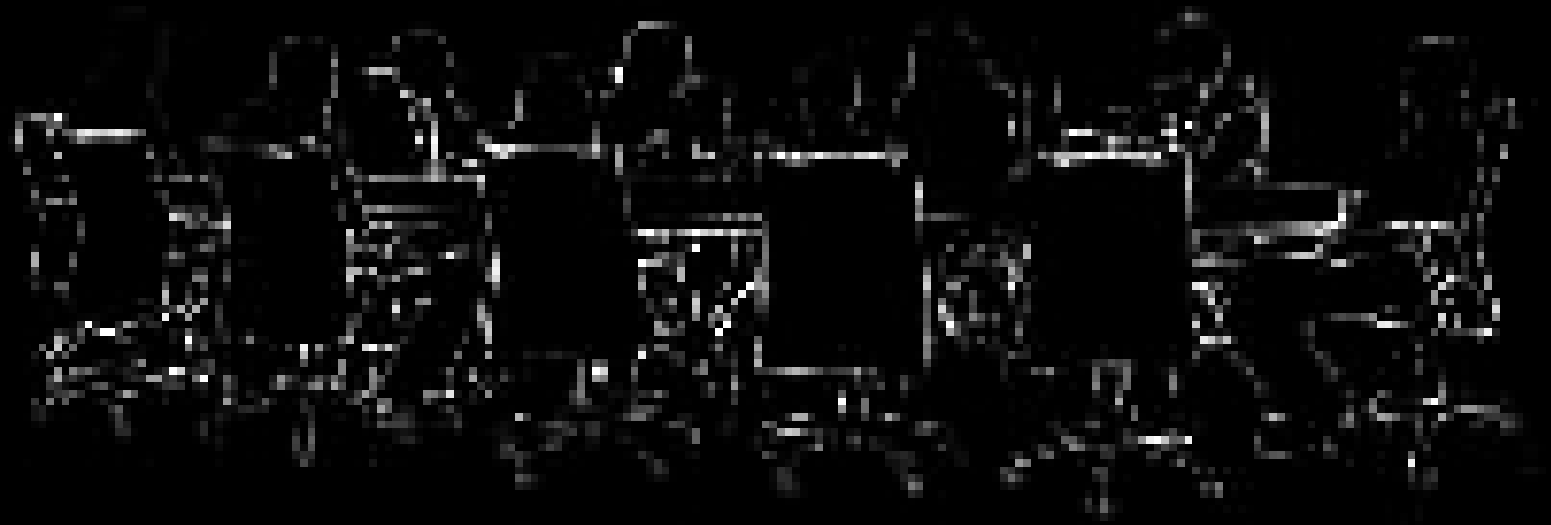
- Liquidity, funding and operational risk management
- Supply chain security over speed and cost
- Physical footprint risk and vulnerabilities
- Data and cyber security

Supply chains revisited

- Resilience and security prioritized over cost and speed (i.e., just-in-time supply chains)
- Diversifying exposures, and moving closer to home where possible
- Government mandates on proximity of pharma, medical and technology
- Re-examining China risk and profile
- Contingency planning for tail-risk scenarios

Capex reallocations toward strategic priorities

- Redirecting more constrained investment resources
- Ensuring revenue growth in the face of slower GDP growth
- Investing in digitization, security and the future



Source: DB Capital Markets Strategy, McKinsey Institute, BCG, Deloitte, PWC, Brookings Institute, Mary Meeker, Oaktree Capital, Council of Foreign Relations, AEI, Center for American Progress.

Corporate Behavior Changes

"Reputation" as an important part of brand

- Company role and behavior during the crisis
- Corporate leaders as early movers on social distancing
- Companies leading as technology and communication platform innovators
- Companies leading on PPE, ventilators and testing equipment
- Companies leading on virus R&D (vaccination, testing, treatments)

Centralized Treasury functionality

- COVID stretched business continuity challenges
- Management of FX cash pools, liquidity, hedging strategies, trade and supply chain finance

Accelerating digital transformation: more virtual, less physical

- Evolving technology channels for customer engagement
- Digital processes, automation and AI as productivity drivers
- Data driven strategy and decision-making
- Lighter physical space footprints
- Leaner employee headcount, slower rehiring
- More tolerance of remote working
- Lowering barriers for improvisation and experimentation

More nationalist protectionism in the corporate sector

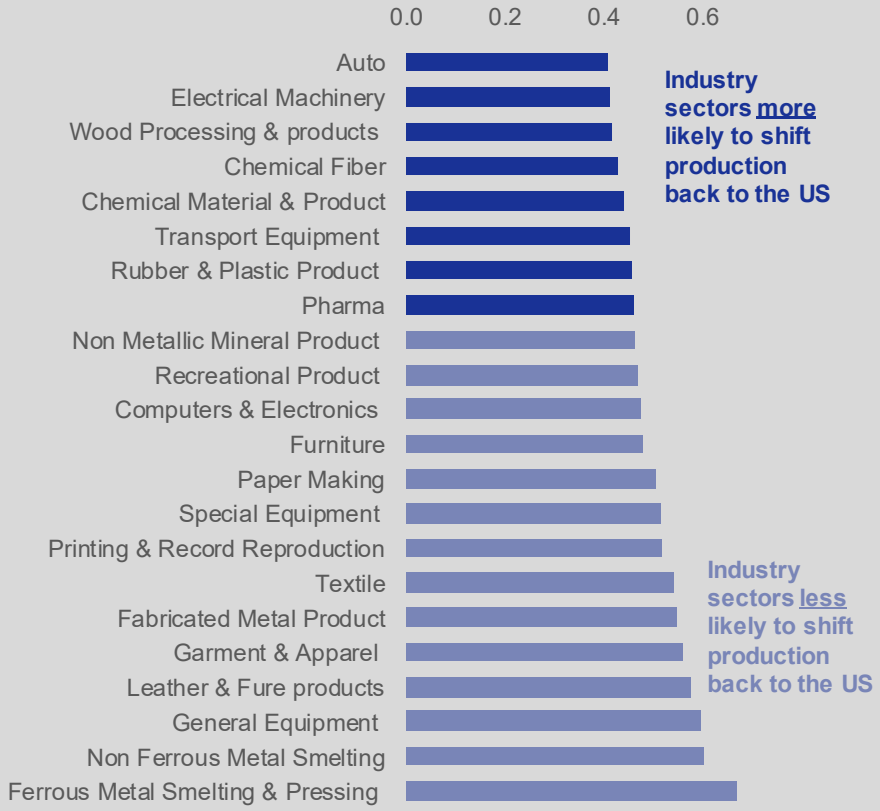
- More protection for domestic companies
- Pushback on activist investors
- Pushback on unwanted acquirers and cross-border mergers
- Increased utilization of poison pills by companies

Source: DB Capital Markets Strategy, McKinsey Institute, BCG, Deloitte, PWC, Brookings Institute, Mary Meeker, Oaktree Capital, Council of Foreign Relations, AEI, Center for American Progress.

Industries More Exposed to China Off Shoring

COVID-19 will likely accelerate the bifurcation of the global economy and rerouting of global supply chains that had already begun with China's rising labor costs and trade war acceleration. However, certain industry sectors are more likely candidates for reshoring than others.

Enodoeconomics Reshoring Index after trade war



Observations

- China's virus containment errors likely to accelerate the "great de-coupling"
- Security of supply chains becoming more important than speed and cost considerations
- Tech, pharma and auto may be under highest pressure to re-shore closer to home
- Automation opportunities an important part of re-shoring decisions
- Rising non-tariff restrictions may become a catalyst (emerging tech or pharma restrictions)
- Industries where Chinese labor costs capped less vulnerable
- Certain high investment, capital intensive industries may take longer to move
- Supply chain diversification does not necessarily mean "back to the US"

Source: (1-2) Enodoeconomics "The Great Decoupling: the Enodo Reshoring Index" (Choyleva) April 23, 2020.

New World Order

Human Behavior Changes

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Geopolitical Rebalancing

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Geopolitical Rebalancing

Debt and deficit constraints, evolving priorities

- Higher allocation to healthcare (5-10% of GDP historically)
- Higher allocation to economic recovery
- Higher government bond issuance
- Higher sovereign risk premiums
- Higher taxes

Increased government spending on healthcare

- Capacity increases (hospitals, beds, ICUs)
- Equipment increases (PPE, ventilators, testing)
- R&D research (vaccines, treatments)
- Hospital, bed and ICU capacity
- Urban planning improvements

Government technology system upgrades

- Addressing decaying and outdated systems ill-equipped for crisis response
- Upgrading technology, coordination and communication capabilities
- Accessibility and payment processing technologies for unemployment
- Strengthening coordination and communication architecture in healthcare response
- Cyber and data security

Government incursions into the private Economy

- Side effect of being the "payer, lender and insurer" of last resort will encourage governments to take action to ensure resiliency (Source: McKinsey)
- Increased regulation of private sector
- Larger government role in public health (paid sick leave)
- Rules on domestic sourcing and workplace safety
- Protection of domestic industry

Source: Atlantic Council, Council of Foreign Relations, WSJ, Financial Times, NY Times, Deloitte, PWC, Brookings Institute, Hudson Institute, Henry Kissinger Institute, AEI, Center for American Progress, Harvard University, McKinsey Institute, Eurasia Group.

Geopolitical Rebalancing

De-globalization trends accelerate

- Rising tariffs, declining trade volumes
- Populism and nationalism over multilateralism
- Less open immigration policy; tighter border controls
- More travel restrictions, especially to high risk virus areas
- Rising protection for domestic industry and companies
- On-shoring critical corporate supply chains closer to home

Acceleration of US - China decoupling and structural rivalry

- Continued rebalancing and unwind of co-dependencies (trade, tech, financial)
- US tech restrictions: semiconductors, telecommunications, AI, and aviation
- Expansion of US CFIUS, FIRRMA and national security investigations targeting China
- China investment and diversification strategies (i.e., Belt & Road)
- China accelerating domestic technology sourcing (Made in China 2025)
- Reinvigorated Chinese state support for technology and industry

Renewed challenges to Euro Area stability and currency union

- 3rd crisis in a decade (Euro, migrant, COVID)
- Sharper divisions (North-South), and stronger crisis mechanisms (ECB, ESM)
- Fiscal and growth constraints
- Impact of balance of power shifts globally

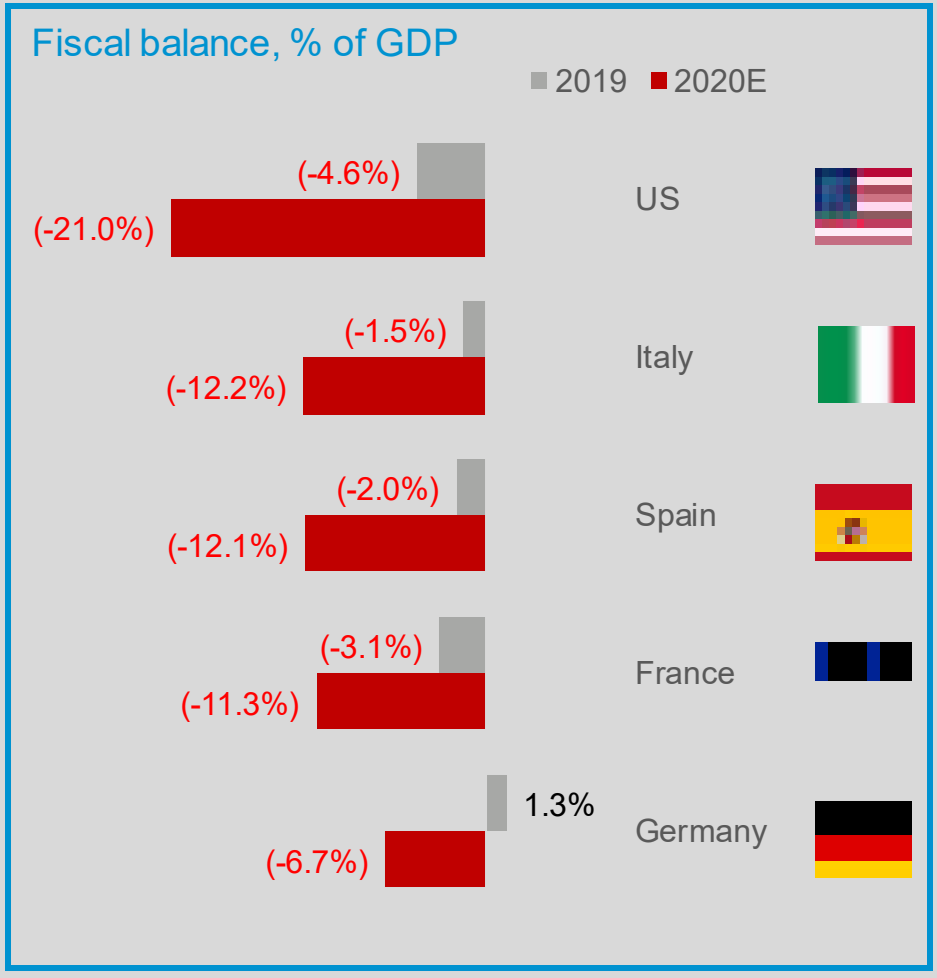
More structurally vulnerable EM complex

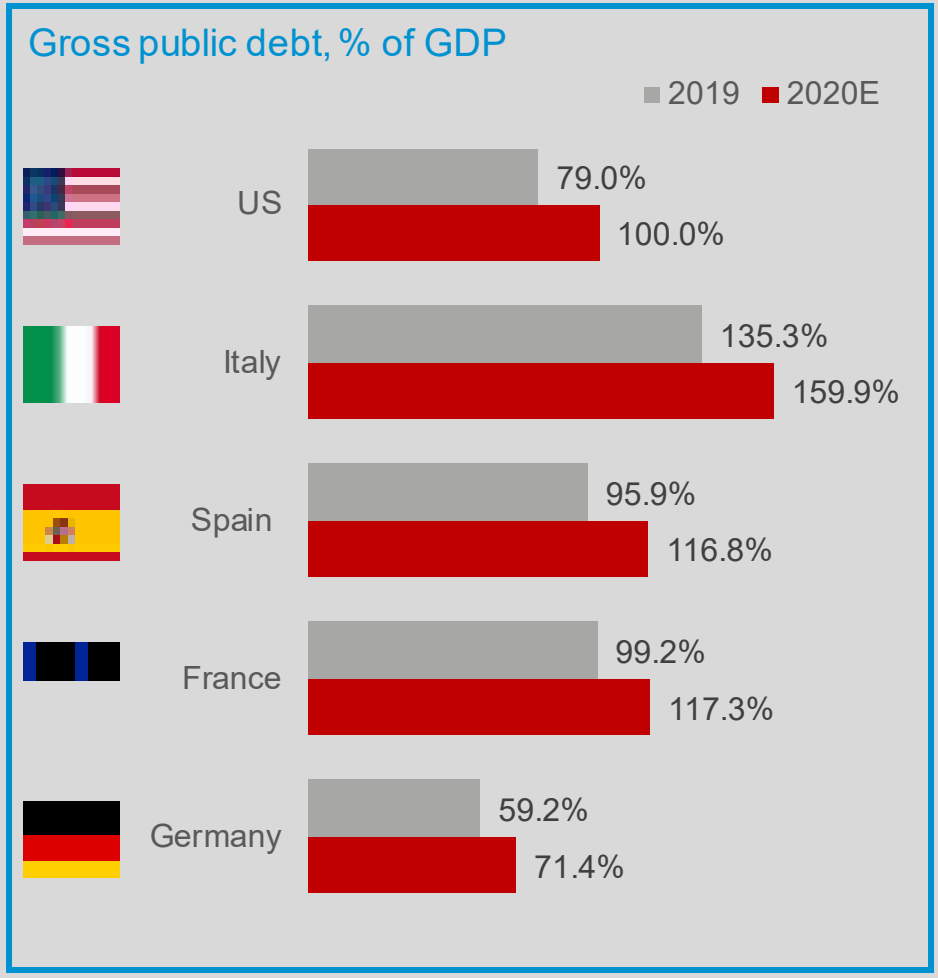
- Most highly impacted by de-globalization trends
- COVID-19 vulnerabilities high; policy response tools weak
- Significant fiscal sustainability, growth and funding concerns
- Socio-political and governance challenges rising

Source: Atlantic Council, Council of Foreign Relations, WSJ, Financial Times, NY Times, Deloitte, PWC, Brookings Institute, Hudson Institute, Henry Kissinger Institute, AEI, Center for American Progress, Harvard University, McKinsey Institute, Eurasia Group

Rising Debt & Deficits

The United States and numerous other global economies are expected to have a full decade of normal course debt / GDP growth in just 1-2 years. According to DB research, 2020 US deficits are expected to expand to 21%. US debt to GDP is projected to increase from 79% to 100% this year alone.





Source: (1-2) DB Global Markets Research "Impact of Covid-19 on the global economy: Beyond the abyss" (David Folkerts-Landau).

Taxation in a Time of Crisis

While it may take years, higher taxes and fewer Government services are an inevitable response to the rising debt burdens of recent years. Over the last 150 years, the US has a strong historical precedent for higher taxation during times of great crisis.

Revenue Act of 1861

President Abraham Lincoln imposes import taxes and a 3% tax on high incomes to fund the Civil War

Revenue Act of 1916 / War Revenue Act of 1917

President Woodrow Wilson reinstates the estate tax, raises the income tax on top earners to 15% and expands the corporate tax to pay for WWI. These taxes were significantly expanded in 1917, with the top bracket rising to 67%.

The Current Tax Payment Act of 1943

Passed into law under President Franklin D. Roosevelt, the US Treasury Department began tax withholding to finance WW2, with the top rate rising above 90%.

New World Order

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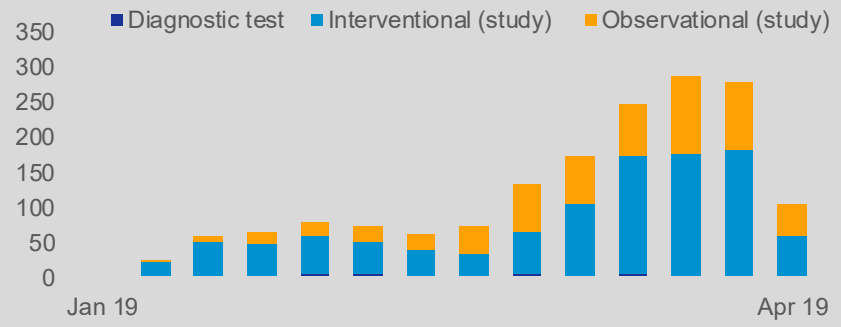
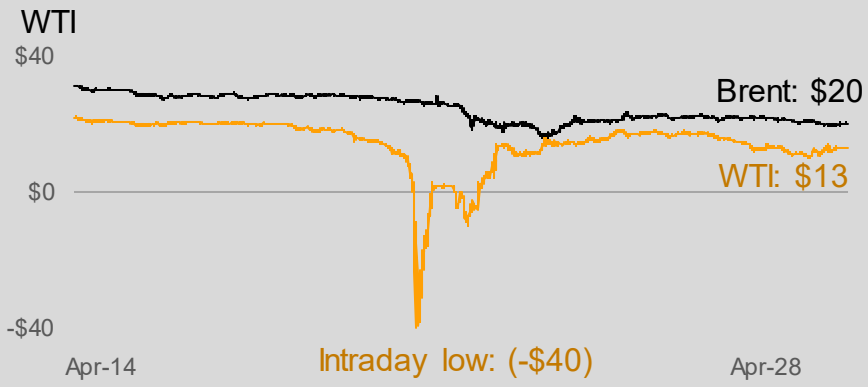
Navigating the Unknowns

#1: Vaccination breakthrough

Number of new trials registered each week, globally

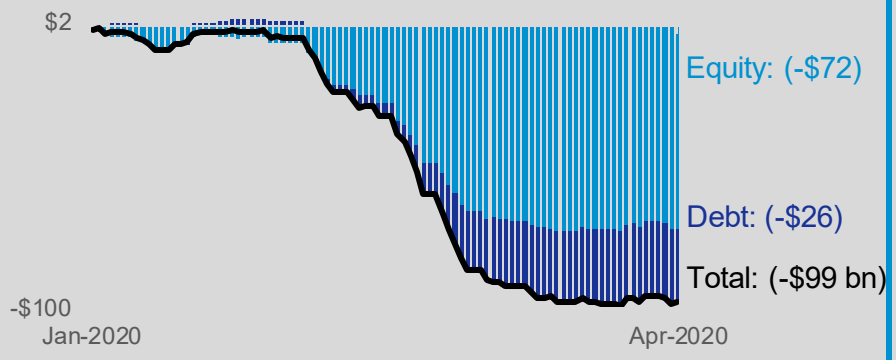


#2: Oil capitulation



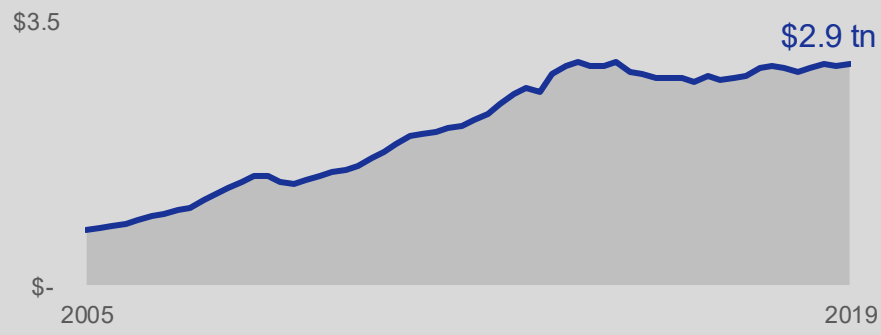
#3: EM stress

Portfolio flows to EM, USD bn



#4: US Dollar strength

USD denominated EM non-financial corporate debt, USD tn

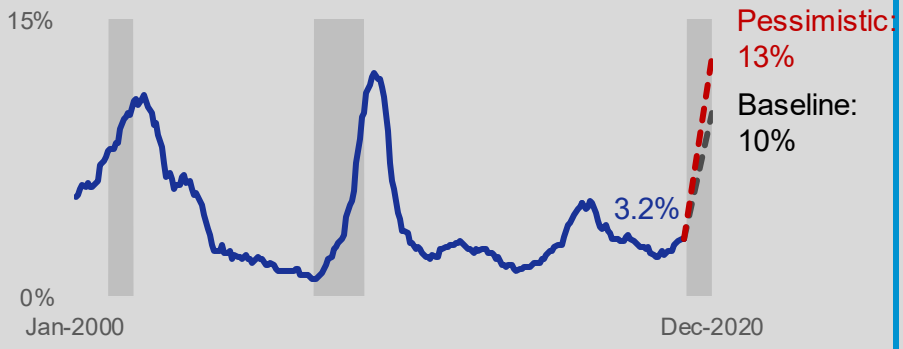


Source: (1) Anticovid by inato. (2) Bloomberg. Data as of April 28, 2020. (3-4) IIF. USD denominated EM debt is for the 22 emerging market economies tracked by the IIF. Data as of April 28, 2020. Fund flows are non-resident portfolio flows to EM.

Navigating the Unknowns

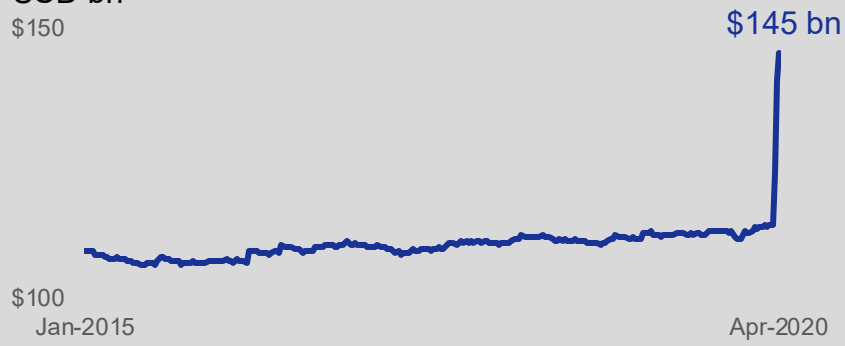
#5: Accelerated credit defaults

US speculative grade default rate forecast



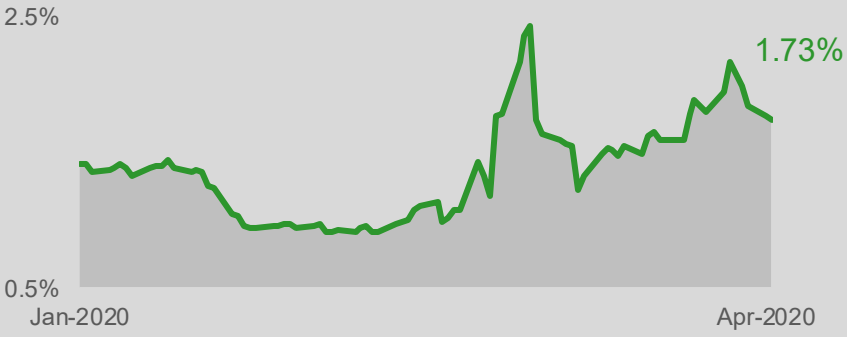
#6: Bank sector financial stress

Allowance for loan and lease losses, all commercial banks, USD bn



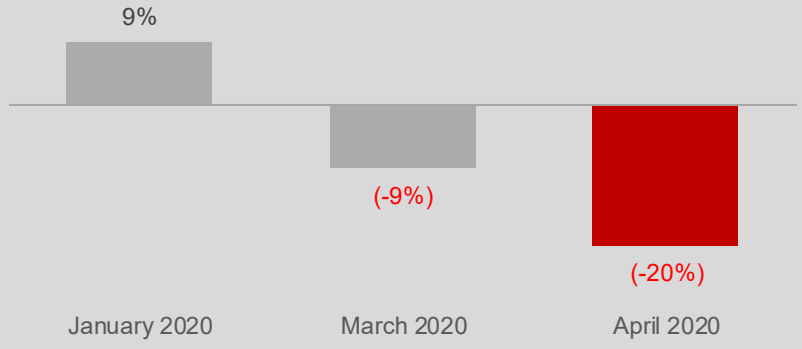
#7: Euro Area stability

Italian 10 year government bonds



#8: Earnings uncertainty

S&P 500 full year 2020 consensus earnings forecast



Source: (1) S&P Capital IQ. (2) FRED. Ending Wednesday level. (3) Bloomberg. Data as of April 28, 2020. (4) S&P 500. Bloomberg. FactSet.

New World Order

Human Behavior Changes

Corporate Behavior Changes

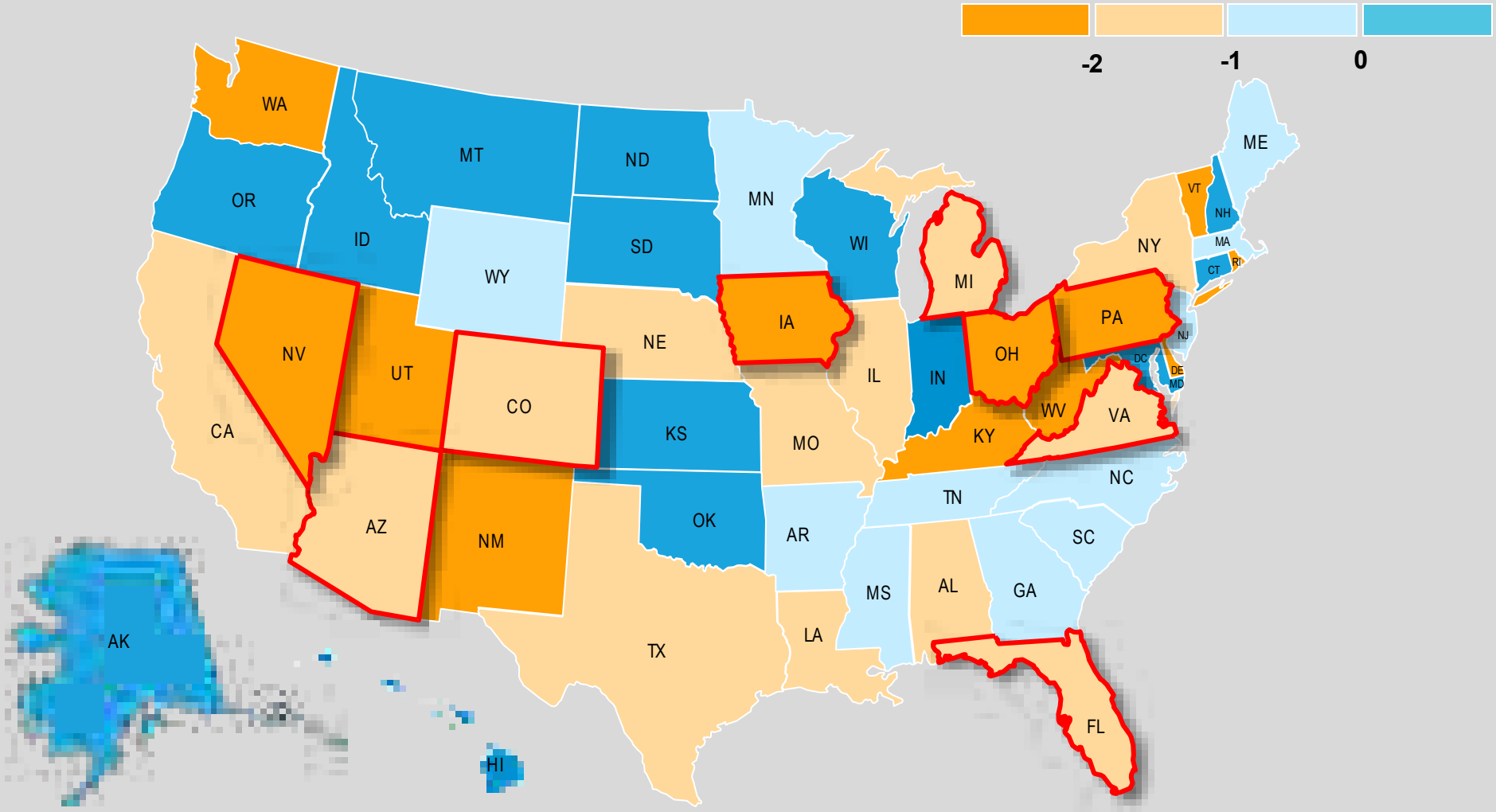
Geopolitical Rebalancing

Navigating the Unknowns

Impact on the 2020 Election

Labor Markets in US Election Battleground States

Labor markets in several of the key 2020 US Presidential election battle ground states have been among the hardest hit, most notably: Pennsylvania, Michigan, Ohio, Florida, Arizona, Nevada, Colorado, Iowa and Virginia

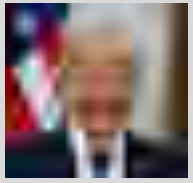


Source: Federal Reserve Bank of Philadelphia's State Coincident Index undefined.

The States That Matter Most

While former Vice President Biden is currently leading in a majority of the states that matter most, many of the poll differentials are within the 3-5% margin of error

Aggregate Real Clear Politics Polling



vs.

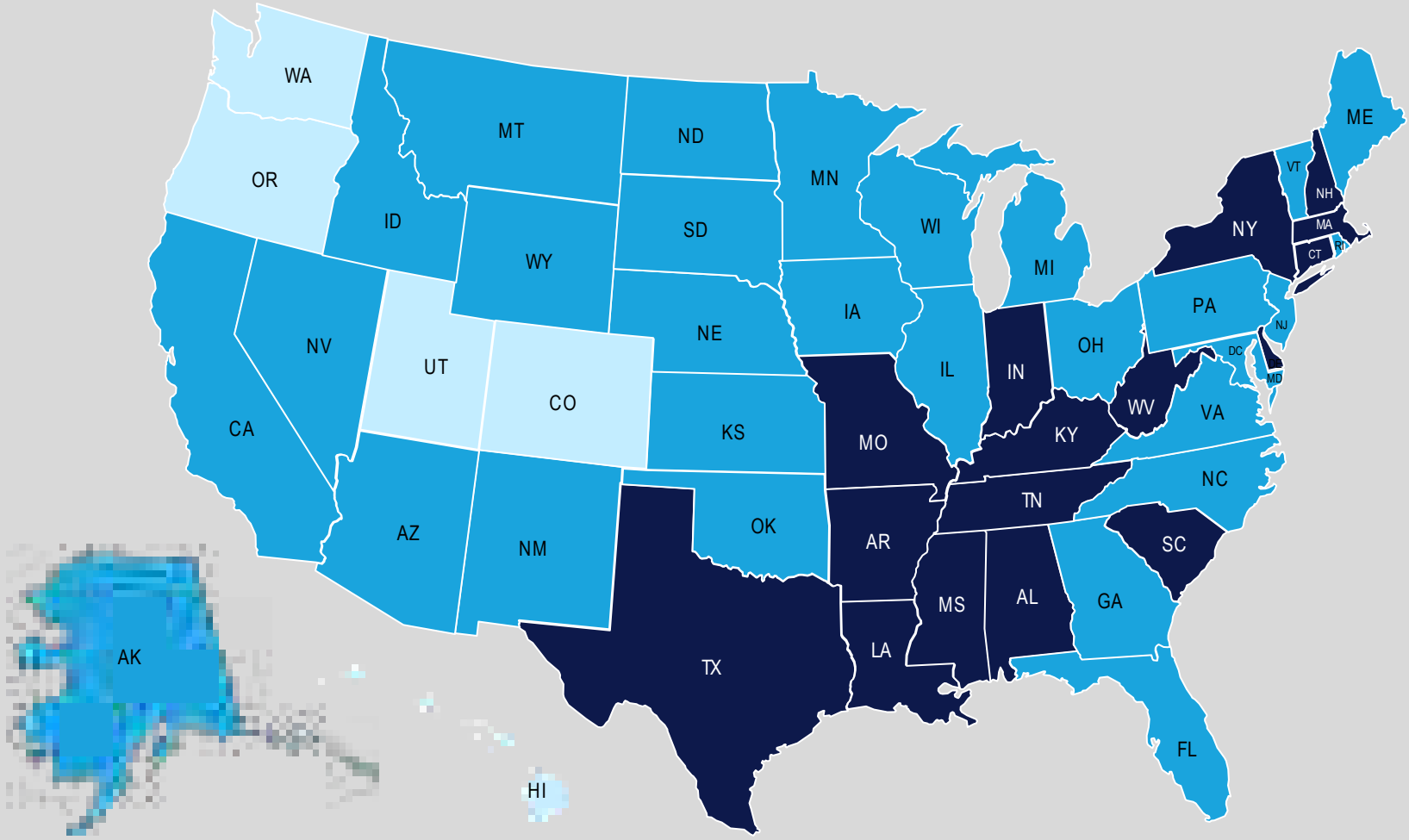
	Trump	Biden	Difference
Pennsylvania	41.3	48.0	Biden +6.7
Michigan	41.0	46.5	Biden +5.5
Wisconsin	44.0	46.7	Biden +2.7
Ohio	44.0	45.0	Biden +1.0
Florida	43.3	46.5	Biden +3.2
North Carolina	47.3	46.0	Trump +1.3
Arizona	44.2	48.6	Biden +4.4
Colorado	43.0	46.0	Biden +3.0
Virginia	41.0	48.3	Biden +7.3
Iowa	51.0	41.0	Trump + 10.0
Nevada	41.0	44.0	Biden +3.0

Source: (1) Real Clear Politics. Based on RCP Average when available. Ohio polling data is from 270towin. Iowa, Colorado, Nevada are FiveThirtyEight polls.

Voting in US Elections by Mail

While the majority of US states do not require a reason to vote by mail, 16 US states do require a reason to vote by mail. 5 US states already rely almost entirely on mail for elections.

- 5 US States that already vote almost entirely by mail
- Majority of US States do not require a reason to vote by mail
- 16 US States that require a reason to vote by mail



Source: Wall Street Journal, Coronavirus Poses Challenges for the Primary Voting Process

When will this end?

When this ends...we will see entire nations come together to honour the bravery of those who showed up, day after day, night after night, to serve them.

The Phoenix, a COVID-inspired video about love and loss, hope and strength, by Irish creative agency, The Tenth Man

COVID-19 Reports

Feb 2020
Containing the Coronavirus

Mar 2020
Coronavirus Contagion

Mar 2020
Maximum Containment, Social Distancing & the Economics of Stoppage

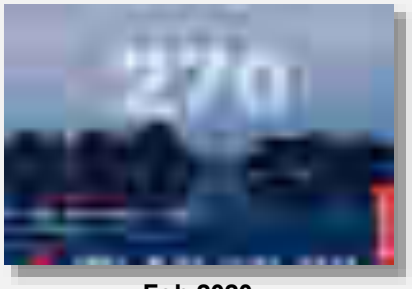
Mar 2020
The COVID-19 Corporate Checklist

Apr 2020
The COVID-19 Global Policy Response

Apr 2020
The COVID-19 Global Policy Response

Past Reports

Past Reports

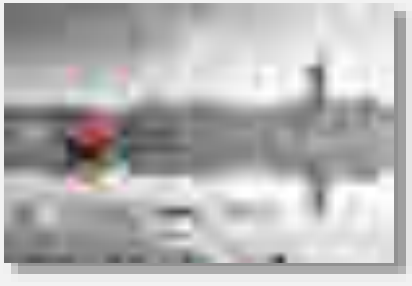


Feb 2020
The Road to 270

Jan 2020
This Time is Different

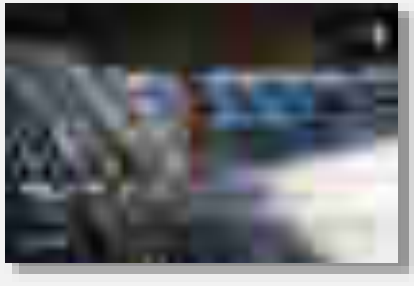
Nov 2019
Superpowers with Structural Issues

Oct 2019
Mixed Signals

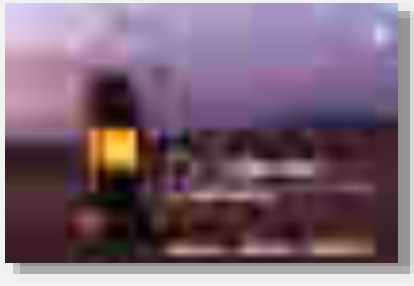


Aug 2019
Accommodation, Escalation & Retaliation

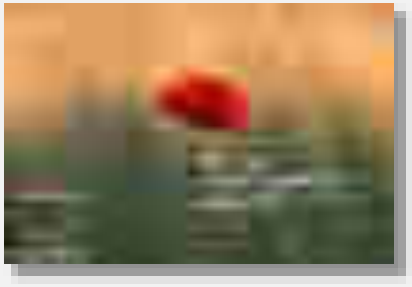
Jun 2019
US Recession Watch



Apr 2019
Pervasive Forces

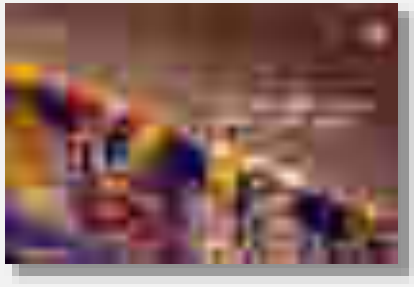


Mar 2019
The Watchman



Nov 2018
Reflections

Nov 2018
Perspectives on Markets & the 2018 US Midterms



Sep 2018
Thinking Differently About Trade Risk

Jul 2018
Delicate Balancing Act

Past Reports

May 2018
Underestimating US Tax Reform

Mar 2018
Regime Change

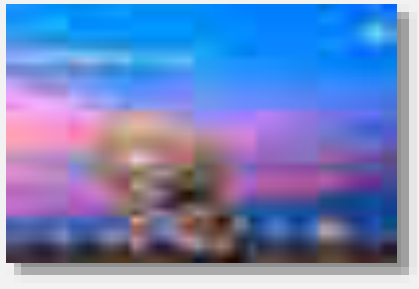
Dec 2017
The US Tax Cuts & Jobs Act

Nov 2017
A November to Remember

Nov 2017
Here Comes the Senate

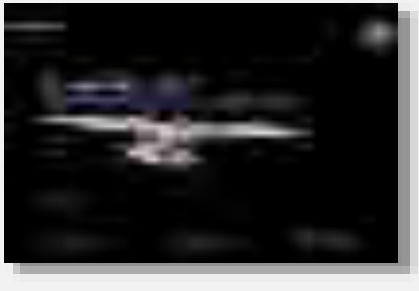
Nov 2017
The House Moves First

Sep 2017
Power, Politics & Markets

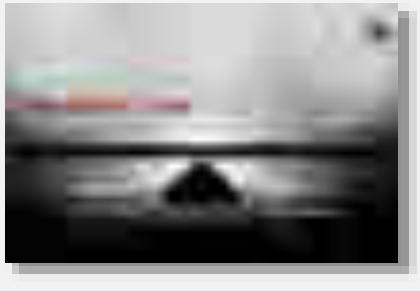


Jul 2017
Bond Market Signals

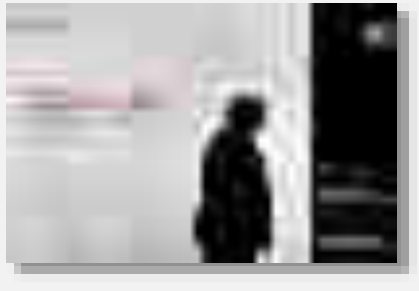
May 2017
Tax Reform Lite



Apr 2017
Dovish Fed Liftoff



Feb 2017
The US Tax Code



Jan 2017
The First 100 Days

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Tom Joyce is a Managing Director and Capital Markets Strategist within Deutsche Bank's Corporate Finance division. Based in New York, Tom heads a team that creates customized analytical content for multi-national US corporates and Fortune 500 companies. His team provides in depth analysis on the impact of economic, political, public policy and regulatory dynamics on the US credit, foreign exchange, rates and commodities markets.

Tom has nearly 25 years of Investment Banking experience at Lehman Brothers (10 years) and Deutsche Bank (14 years) in New York, London, Hong Kong, and San Francisco. Over the last 14 years, Tom created and built the Capital Markets Strategy role within Deutsche Bank's Investment Bank. He has previously served as the host of the Corporate Finance Monday morning meeting (4 years) and the Managing Director Promotion Committee (2 years).

Tom's educational background includes a year of study at Oxford University from 1991 - 1992, a Bachelor of Arts in Political Science from Holy Cross College in 1993, and a MBA from Kellogg Business School, Northwestern University in 2000.

Tom resides in New Canaan, CT with his wife and four sons, where he serves on the Board of Trustees of the New Canaan Library, and the Board of the New Canaan Football (Soccer) Club. He also coaches youth soccer, basketball and lacrosse.

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Additionally, he heads up the Bank's U.S. Direct Investment Advisory Group (DIAG) providing strategic counsel to non-US companies engaged in cross-border mergers and acquisitions requiring regulatory and political approvals. Frank also serves as the Bank's Chief Political Risk Strategist advising clients on geopolitical and domestic risk issues and their impact on markets and industry sectors.

He also represents Deutsche Bank on the Board of Directors of the Securities Industry and Financial Markets Association (SIFMA). Previously, Frank was the Bank's Head of Communications & Public Affairs – Americas overseeing legislative and regulatory matters, corporate and internal communications, branding and advertising and conferences and events for Deutsche Bank in the Western Hemisphere.

Prior to joining Deutsche Bank, Frank held senior positions at both Charles Schwab & Co. and Merrill Lynch & Co, Inc.

Before joining the private sector, Frank served at the U.S. Securities and Exchange Commission as Chief Spokesman and Senior Policy Advisor to the Chairman as well as the US Department of Justice as Assistant to the Director for Policy Development managing international issues.

Prior to these posts, he served on the White House staff of George H. W. Bush and, earlier, on the staff of the Ronald Reagan White House where he started as a writer for President Reagan.

He is a member of the Council on Foreign Relations and the International Institute of Strategic Studies. He serves as a member of the Board of Directors of the American Council on Germany and American Institute for Contemporary German Studies.

Frank, his wife, Maura, and their two living children reside in Great Falls, Virginia.

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Prior to joining Capital Markets Strategy, Hailey spent nearly three years in Deutsche Bank's Consumer Equity Specialty Sales group. As part of the Global Markets division, her team focused on providing insights, opinions, and flow updates on the consumer equity space to the bank's largest institutional investor clients.

Hailey graduated with honors from the University of Michigan's Ross School of Business with a BBA and a minor in International Studies.

In March 2020, Crane's New York Business Magazine named Hailey one of the "Rising Star's in Banking and Finance."

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