



COVID-19 & ESG:

Covid Economic Recovery Index

CERI™ **Guide**

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Covid-19 & ESG: The Covid Economic Recovery Index User's Guide

Air pollution increases COVID-19 mortality, hence also **economic fragility**. Good governance, social distancing, and fiscal support can mitigate damage and enhance **post-pandemic economic prospects**. We gathered **loads of data**, then cleaned, parsed, curated, and linked them.

Then we indexed it all and called it CERI.

We believe it will prove to be an essential guide in **country allocation** decisions for investment managers. But we also hope it will become reference points for policy makers, and a bridge to a **deeper conversation about how the health of people and planet** drive the global economy.

Welcome to CERI

Following the release of our first report regarding our outlook for a post-pandemic world, we tried to locate excess mortality data and were disappointed. Thus, we created a perhaps blunt, but nevertheless useful ranking system to find the countries with the highest and lowest COVID-19 mortality risk in our second report. It was of course only a crude first stab, and we recognized that there was a myriad of other variables that needed to be considered. Thus, was born CERI – the Covid Economic Recovery Index.

In the pages that follow you will find an overview of the background story and data that led us to build this index, as well information about its construction, and how one might deploy it.

We believe you will find CERI to be an invaluable compass as we collectively navigate a vastly different and unfamiliar landscape.



Key Takeaways

- The release of the COVID-19 vaccines is positive news, but rollout and adoption will take time, making 2021 a crucial year for containment and economic support.
- CERI is meant to complement macro analysis. It should be used on an apples-to-apples comparative basis.
- A sample view of the top four and bottom four countries ranked by CERI is below.
- A full list of countries currently tracked by CERI can be found in the Appendix.

A CERI Sample

Below are two sets of **snapshots from CERI**. The first lists the top three **developed market countries** best positioned for rebound, followed by the bottom three least well positioned for rebound.

The second sample set shows the top three **emerging market countries** best positioned for economic rebound, followed by the three least well positioned for rebound.

Developed Markets

Country Name, Region & Income Group				Subindices				CERI	Economic Context			
Country	Region	Tourmaline Region Names	Income Group	Vulnerability	Pandemic Governance	Social Response	Economic / Fiscal Support	Rank of relative economic performance post-pandemic	Consumer as % GDP	GFCI as % GDP	Govt as % GDP	Avg Growth over last 5 yrs
United Kingdom	EU + EFTA + North America	Western Europe	High	13%	30%	18%	8%	16%	65.0	17.4	16.9	1.8
Canada	EU + EFTA + North America	North America	High	15%	21%	31%	13%	20%	58.0	23.2	21.0	1.7
France	EU + EFTA + North America	Western Europe	High	16%	25%	31%	13%	21%	54.0	23.4	23.5	1.6
Poland	EU + EFTA + North America	Western Europe	High	23%	48%	65%	32%	42%	58.1	30.0	17.9	4.3
Japan	East Asia & Pacific	Asia	High	11%	53%	69%	39%	43%	55.8	23.9	9.8	1.0
Greece	EU + EFTA + North America	Western Europe	High	49%	44%	63%	22%	45%	68.7	12.0	9.8	0.9

Emerging Markets

Country Name, Region & Income Group				Subindices				CERI	Economic Context			
Country	Region	Tourmaline Region Names	Income Group	Vulnerability	Pandemic Governance	Social Response	Economic / Fiscal Support	Rank of relative economic performance post-pandemic	Consumer as % GDP	GFCI as % GDP	Govt as % GDP	Avg Growth over last 5 yrs
Argentina	Latin America & Caribbean	LatAm	Upper middle	33%	18%	16%	29%	24%	65.5	16.6	11.0	-0.3
Peru	Latin America & Caribbean	LatAm	Upper middle	60%	32%	1%	26%	30%	64.6	21.8	13.2	3.2
Honduras	Latin America & Caribbean	LatAm	Lower middle	49%	47%	6%	20%	30%	78.2	24.3	3.8	3.8
Belarus	Eastern Europe & Central Asia	Eastern Europe	Upper middle	21%	74%	68%	75%	65%	54.1	28.1	15.6	0.1
Nicaragua	Latin America & Caribbean	LatAm	Lower middle	50%	96%	59%	75%	70%	70.5	21.1	14.8	1.2
Afghanistan	South Asia	Middle East	Low	93%	88%	64%	75%	85%	81.2	16.6	12.7	2.2

Introduction

The Covid Economic Recovery Index, or CERI, is an index in that it links disparate data, then ranks countries from top to bottom percentile. The top percentiles being the countries expected to see a strong economic rebound from Covid. The bottom percentiles are expected to experience weaker economic recoveries.

“Strong” and “weak” are not quantified in the rankings. They should be interpreted relative to their long-term average growth rates, or what economists call “potential growth.” Subscribers to the CERI will find the average rate of growth over the last five years listed next to the names of each country. We decided to use the last five, rather than the last ten (the economic norm) because a lot has changed in the last ten months. Going back farther than five years seemed too far.

In the section titled Interpreting CERI we discuss how investment managers might deploy CERI into their analysis or investment decisions.



What is CERI based on? Is there any empirical basis for it?

Creating a country allocation model or ranking was never the goal. This project started out as a question, posed this spring:

“Is there anything we learned from the 1918 pandemic that can be used in macroeconomic analysis today?”

As it turned out, yes, there was quite a lot. At the time, researchers at MIT and the Federal Reserve had [co-published a white paper](#) that became one of the pillars for our report released in July: [Covid-19 & ESG: Part 1: Lives Matter to Livelihoods](#).

The second pillar to Part 1 was [research](#) from the Harvard School of Public Health that linked air pollution to COVID-19 mortality. The fact that air pollution has profound effects on human health is [well-known](#), but this study was instrumental in that it speaks directly to Covid-19 mortality rates using data that is easily accessible and publicly available.

Short Summary

Part 1: Lives Matter to Livelihoods

First Pillar

The Fed/MIT paper that looked at the Spanish Flu pandemic of 1918 from the perspective of 43 US cities and concluded that:

1. High mortality rates were negatively correlated with economic recovery.
2. Non-pharmaceutical public health interventions (NPI) such as masks, social distancing, lockdowns, etc. did not exacerbate the economic crisis caused by the pandemic.
3. NPI reduced mortality rates and therefore these cities experienced better economic outcomes after the pandemic.

Second Pillar

A Harvard study found that a 1 microgram increase in PM2.5 pollution per cubic meter increases COVID-19 mortality by 8 percent. This we found key in attempting to gauge the baseline vulnerability – or rather *relative* baseline vulnerability of populations because it is data that is readily available and speaks *directly* to COVID-19 mortality. (While the incidence of pre-existing conditions in a population would seem to be the best way to establish a country's baseline vulnerability to COVID-19 mortality, these data suffer from a variety of problems.)



Short Summary

Part 2: Taking a Stab at Excess Mortality

In Part 2 we made the ideas in Part 1 more tangible by quantifying NPI with data.

1. We ranked countries' management of the pandemic using Oxford University's [Coronavirus Government Response Tracker](#), specifically the Stringency Index.
2. Used Google's anonymized geolocation data to rank each population's level of social distancing.
3. A preliminary ranking – a “first cut” of countries most and least likely to “win” after the pandemic. This first cut was a simple ranking of air pollution, the Stringency Index, and a measure of social distancing using Google's data.



CERI takes the findings from Part 1, the framework from Part 2, and adds finishing touches. The “first cut” from Part 2 was a nice starting point, but it was incomplete. In CERI, we make some refinements and add more dimensions.

1. More granular PM 2.5 data pertaining to the percentage of the population exposed to poor air quality is used.
2. The Stringency Index is swapped out for the Containment Index, which has more dimensions such as contact tracing and testing.
3. Maternal mortality rates are added as a measure for quality of health care.
4. The World Justice Project's Governance Index is included to balance/contextualize the Oxford rankings.
5. Oxford's Pandemic Economic Response Indices are incorporated to account for the importance of fiscal support.
6. Contextual information regarding the economic structure is provided as a guide for the user.



CERI Construction

CERI is composed of four parts, or sub-indices:

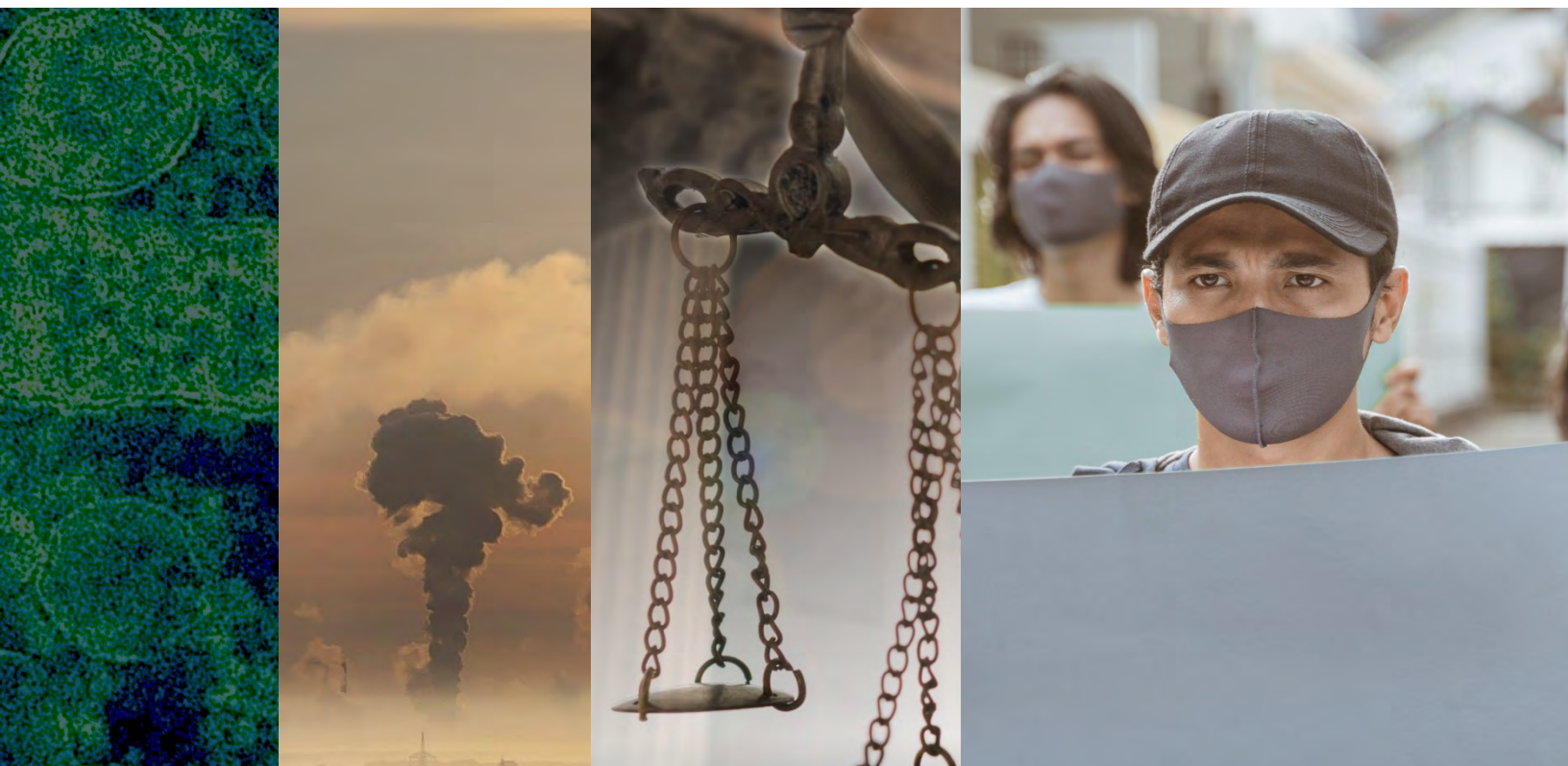
- Vulnerability of the Population
- Pandemic Governance
- Social Response
- Economic Support

We believe these categories capture the challenges and the characteristics needed for our collective economic recovery from this pandemic.

We give 50% weight to vulnerability and 50% weight to the combined average of remaining subindices. Our justification for this is that actions are likely a response to vulnerability. We did not want CERI to highly rank countries with strong responses, thereby underweighting the significance of their vulnerability. An example of this is China vs. Sweden. China is highly vulnerable, and thus has arguably the harshest lockdown. Sweden is one of the least vulnerable and has almost ignored the pandemic.

In order to combine dimensions, each vector, subindex and overall index are percentile rankings.

$$\text{CERI} = 0.5 * \text{VULNERABILITY} + 0.5 * (\text{avg}(\text{GOVERNANCE}, \text{SOCIAL}, \text{ECONOMIC}))$$



The vulnerability subindex attempts to rank the relative baseline vulnerability of a population

The vulnerability subindex is an average of:

- 1. Percentile ranking of the Tourmaline Adjusted PM 2.5 Exposure**
- 2. Percentile ranking of the maternal mortality rate**

How is the Tourmaline Adjusted PM 2.5 exposure calculated, and why?

For the “Tourmaline Adjusted PM 2.5” we take the population weighted mean annual exposure to PM 2.5 ug/m³ taken from the Global Burden of Disease Study of 2017¹ (GBD 2017), and adjust it if more than 40% of the population was exposed to a higher level of air pollution, using later data from [Washington University in St. Louis](#)².

For example, say the level of PM 2.5 is found to be 7, but in the years since the GBD 2017 the population grew substantially in an urban area, causing 42% of the population to be exposed to a PM 2.5 level of 10 ug/m³ – the overall level then was defaulted to 10 rather than 7.

¹ For more information on the GBD Study: <https://sites.wustl.edu/acag/datasets/gbd-maps/>

² Only a handful of adjustments were needed.



Maternal Mortality – Why is this important?

Maternal mortality refers to deaths due to complications from pregnancy and childbirth, and it is an [international indicator](#) for the [overall health](#) of a population³ because it is easily measurable (in so much as bureaucratic data are reliable), and easily comparable across countries, cultures, etc. Women who bear children tend to be young and healthy, thus having a baby should never be a cause of death. Maternal deaths tend to be caused by issues that are preventable with minimal care or guidance.

Societies with low maternal mortality have good basic health care. We wanted to measure the baseline health, or vulnerability to COVID-19, thus air pollution rankings, adjusted by maternal mortality rankings was a good place to start.

³ Infant mortality is another gold standard international indicator of the health of a society, and we may include it in subsequent updates.

Adjustments are made to maternal mortality rates, when we believe it is justified

The [maternal mortality](#) rates used in CERI were taken from UNICEF, where they were collected from national governments. As with all bureaucratically collected data, there are problems. In looking over the results we found that Italy, Spain and Greece had suspiciously low rates. All were modified based on a [correcting study done for Italy](#).

The Pandemic Governance subindex ranks management of the pandemic – reality adjusted

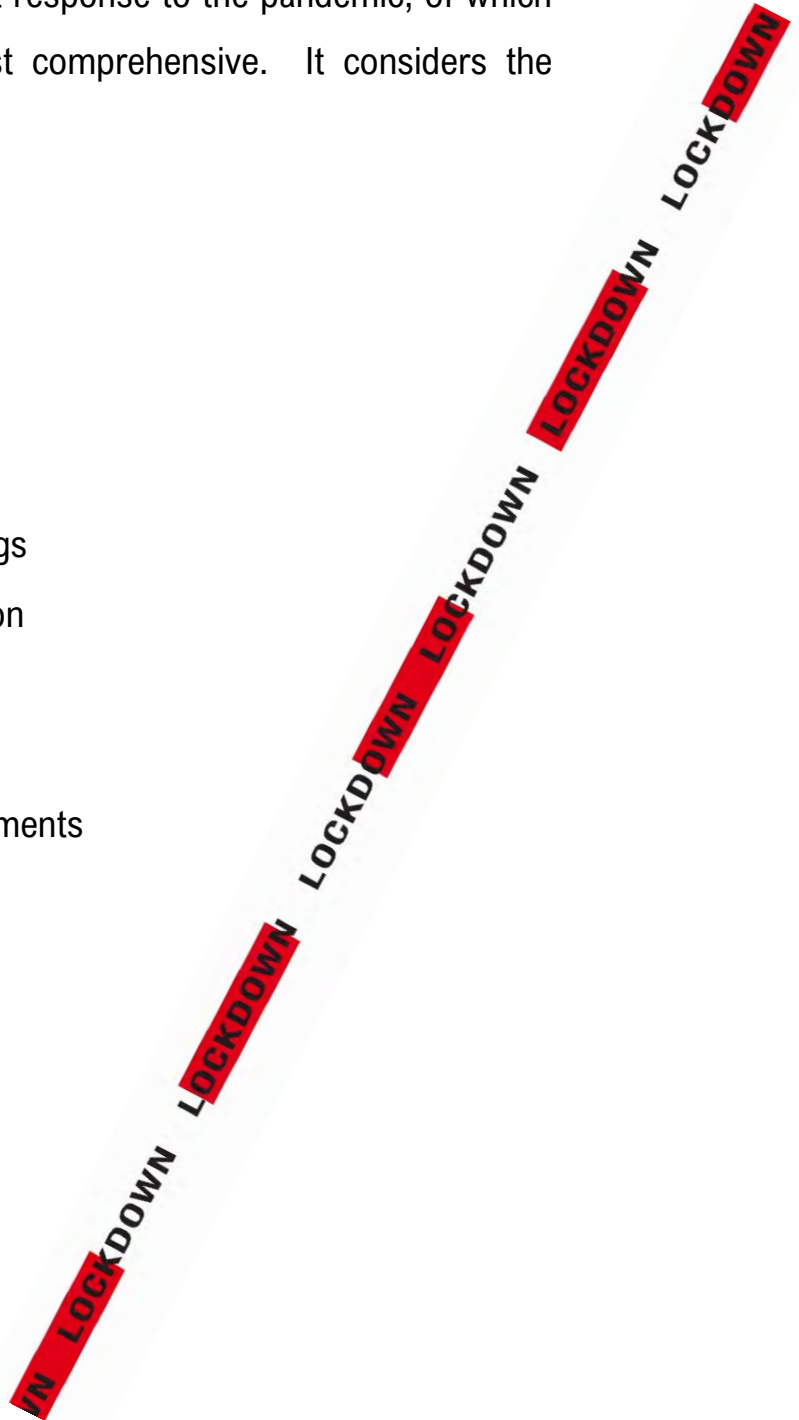
The Pandemic Governance subindex is an average of:

- 1. The percentile rank of Oxford University's Containment Index**
- 2. The percentile rank of the World Justice Project's 2020 Rule of Law Index**

OxCGRT Containment Index

Oxford University's Blavatnik School of Government has [launched a series](#) of indices that measure government response to the pandemic, of which the [Containment Index](#) is the most comprehensive. It considers the following:

- School closures
- Workplace closures
- Public event cancellation
- Restriction on public gatherings
- Closure of public transportation
- Public information campaigns
- Stay at home orders
- Restrictions on internal movements
- International travel controls
- Contact tracing
- Testing policy
- Face coverings
- Vaccination policies



World Justice Project -- Rule of Law Index

We added the 2020 Rule of Law percentile rankings to balance the Containment Index with a reality check.

A high-ranking country on the containment index might be otherwise very poorly managed -- which will of course lead to problems in implementation. Averaging the OxBGRT Containment Index with World Justice Project's Rule of Law Index ⁴ gives it a reality check.

The Social Response subindex ranks social distancing efforts

The Social Response subindex is an average of the percentile rankings of the “percent change from baseline” data from Google's Community Mobility Reports. The following four categories are used:

- 1. Retail and entertainment**
- 2. Residential**
- 3. Transit**
- 4. Workplace**

⁴ The World Justice Project is our preferred provider of governance rankings because the data is collected directly from local populations, by people hired by WPJ.

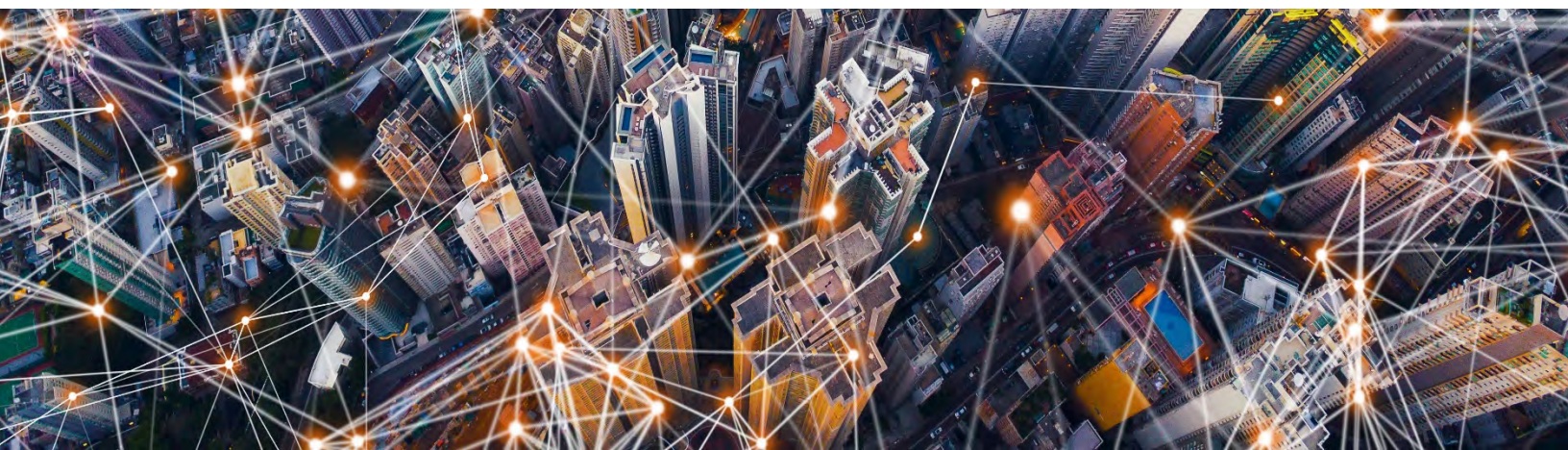
Google Geolocation Data

While the Pandemic Governance subindex may do a fair job of capturing the government's efforts, it may not necessarily reflect what people are doing on the ground. Hence, we use [Google's Community Mobility Reports](#), which tracks changes in mobility since the pandemic.

While Google offers six categories, we limited our use to four categories. A longer discussion about why these four were selected can be found in our [previous report](#).

The China Exception

CERI was built only with countries for which data was available – except for China. Because China does not allow any data sharing, Google does not report geolocation data for it. However, Tourmaline is confident that there has been no lockdown as comprehensive nor as closely monitored as in China. Thus, we gave the country top scores on Social Adherence, and included China in the index.



The Economic / Fiscal Support ranks income support as well as debt and contract moratoriums

The Economic / Fiscal Support subindex is comprised of:

- 1. (25%) Percentile rank of the Oxford Pandemic & Contract Relief Index**
- 2. (75%) Percentile rank of the Oxford Pandemic Income Support Index**

We gave pandemic income support a greater weight than contract relief because:

1. Fiscal stimulus will be the primary driver of economic recovery once vaccines are fully rolled out.
2. Lack of income support now can wipe out decades of progress on poverty relief. Pushing households back into destitution is not only a horrible human tragedy, but also has severe economic consequences which negatively impact potential growth.

It is beyond the scope of this user's manual to discuss the full economic implications, but please email or call us if you would like to discuss this further.

Interpreting CERI

The Covid Economic Recovery Index (CERI) is an average of percentile rankings where 1% is the top one percent, and 100% is dead last. It is color coded. Green is good, red is bad.

CERI does not identify which countries are likely to grow the fastest.

The percentile rankings provide insight on how well each country is positioned for rebound, relative to others for which data is available.

For example, currently the UK is positioned in first place, and Niger in last place. This does not mean that the UK will grow faster than Niger. Growth in the UK over the last five years has been only 1.8%, whereas in Niger it has been 5.6%. Given that strong economic recoveries tend to be a high beta of historical growth, it is more than likely that Niger will grow faster than the UK.... This also does not mean that Niger investment will be a better investment than one in the UK.

The best way to use CERI is on a comparable basis.

Apples to Apples comparisons

Comparing positioning for economic rebound between countries in similar economic categories, income levels or regions will yield the most interesting perspectives.

For example, by clicking on the carrot on the table headers you can filter for a region of interest, then sort the CERI from smallest to largest to view the relative rankings. This should provide the user with relevant and actionable information pertaining to the readiness for economic rebound.

Economic Context

Once a comparable group has been selected and sorted, a look at the economic context for the countries in question may be useful to the user. Consider the fact that the MIT/Fed study concluded that hard hit areas had lackluster post-pandemic economic recoveries because of depressed consumer demand. Countries whose economies are not consumer driven may be at an advantage relative to others – if, of course, the government executes a strong and well administered fiscal expansion.

Another China Exception

Tourmaline believes that China may be an exception to the context under which CERI was built. China's household consumption as a percentage of GDP is only 38%, with the remainder driven primarily by government directed spending. Whether the consumer recovers quickly or strongly will matter much less in China than in the rest of the world.

Appendix

Countries currently tracked by CERI:

Afghanistan
Angola
Argentina
Austria
Bangladesh
Barbados
Belarus
Belgium
Belize
Benin
Bolivia
Bosnia and Herzegovina
Botswana
Brazil
Bulgaria
Burkina Faso
Cambodia
Cameroon
Chile
China
Colombia
Costa Rica
Cote d'Ivoire
Croatia
Czech Republic
Denmark
Dominican Republic

Ecuador
Egypt
El Salvador
Estonia
Finland
France
Georgia
Germany
Ghana
Greece
Guatemala
Honduras
Hungary
India
Indonesia
Italy
Jamaica
Japan
Jordan
Kazakhstan
Kenya
Kyrgyzstan
Lebanon
Malaysia
Mali
Mauritius
Mexico
Moldova
Mongolia
Morocco
Mozambique
Myanmar
Namibia
Nepal
Netherlands
Nicaragua
Niger
Nigeria

Norway
Pakistan
Panama
Peru
Philippines
Poland
Portugal
Romania
Russia
Rwanda
Senegal
Serbia
Singapore
Slovenia
South Africa
South Korea
Spain
Sri Lanka
Sweden
Tanzania
Thailand
Togo
Trinidad and Tobago
Turkey
Uganda
Ukraine
United Arab Emirates
United Kingdom
Uruguay
Vietnam
Zambia
Zimbabwe

