BBVA Research

Monitoring Covid-19 pandemic using Big Data from the media

Covid-19 impact in mass media information

5 May 2020

Creating Opportunities

BBVA Research

HEALTH: Geographic view of Covid-19: Reported infection vs. media stress

ECONOMICS: How Covid-19 economic impact reflects on media information

POLITICS: Time to monitor governments' decisions to fight Covid-19

Main takeaways

HEALTH

- Cumulative data confirms that contagion for Covid-19 in Europe and the US are the most severe in the world.
- Media Stress Index has eased off worldwide over the last days.
- Media stress is positively correlated with the number of new infected people but not with the death rate.

ECONOMICS

- While economic sectors suffer demand and supply shocks, the health sector and institutions try to mitigate the crisis with interventions.
- Sectors' stress exhibit a different response depending on their nature.
- The ECB and the Fed show synchronized responses. People's Bank of China acted earlier and has the highest media coverage.

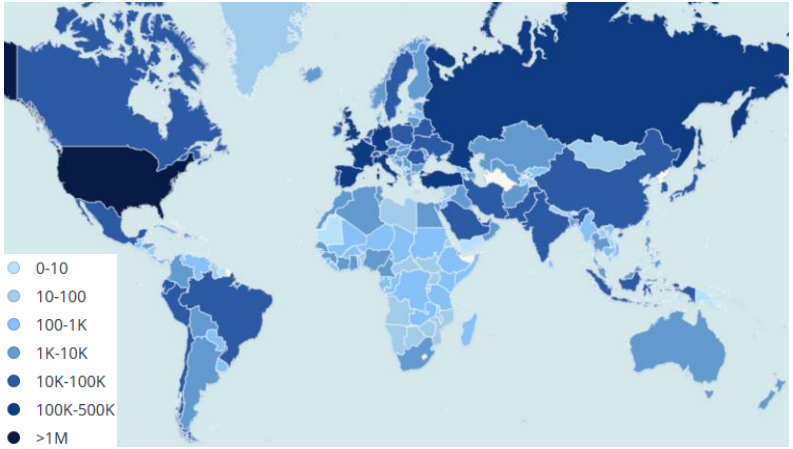
POLITICS

- Politics is in the center of the debate due to its impact on health and economy.
- Media stress associated with Governments diminishes as countries start lifting lockdown measures and infection is showing signs of containment.
- There is a bias between the international and the national media sentiment towards governments' responses.

HEALTH

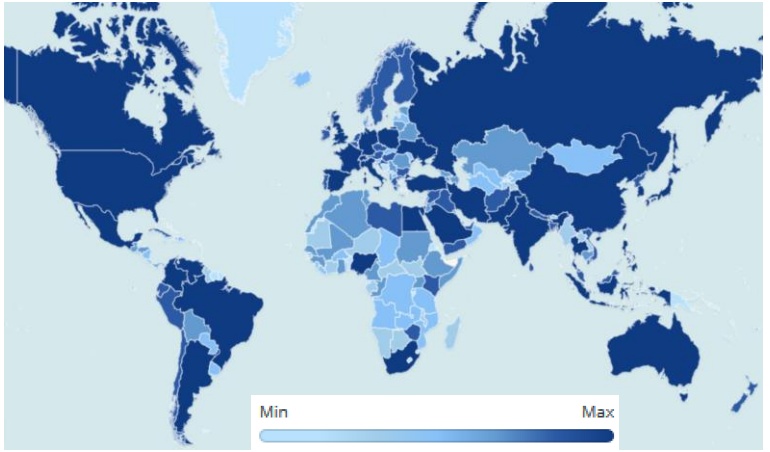
Covid-19 extent of contagion worldwide is reflected in the media

TOTAL CONFIRMED COVID-19 CASES, ACCUMULATED AT 4-MAY



Source: ECDC

GLOBAL MEDIA STRESS INDEX OF COVID-19, 1FEB-4MAY 2020 Tone in the media speaking about covid-19 weighted by coverage



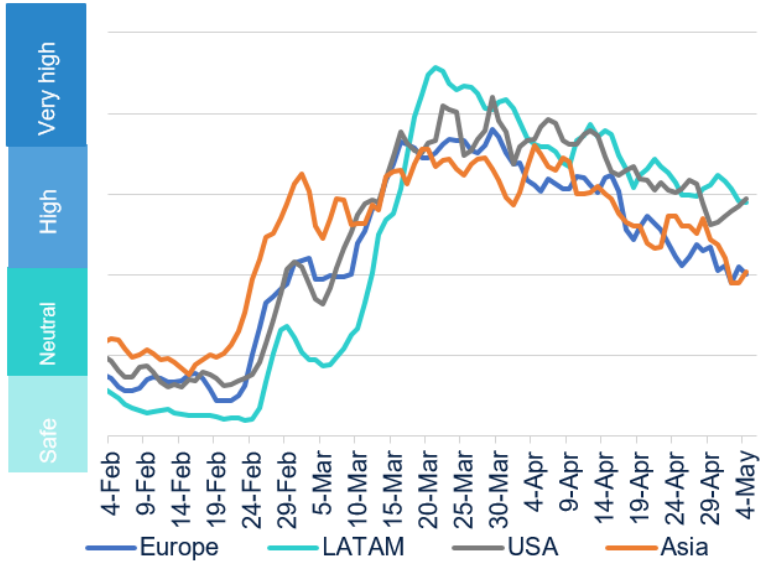
Source: BBVA Research and GDELT

- **Media stress index mimics the world distribution of infections and it is reflecting the increasing concerns all over the world**.
- The **United States** has become one of the main outbreaks of the pandemic.
- **Southern Europe** most affected by the health crisis. Spain, Italy and France stand out.
- In Latin America, **Brazil** is the most touched country by the pandemic, followed by **Peru** and **Ecuador**.

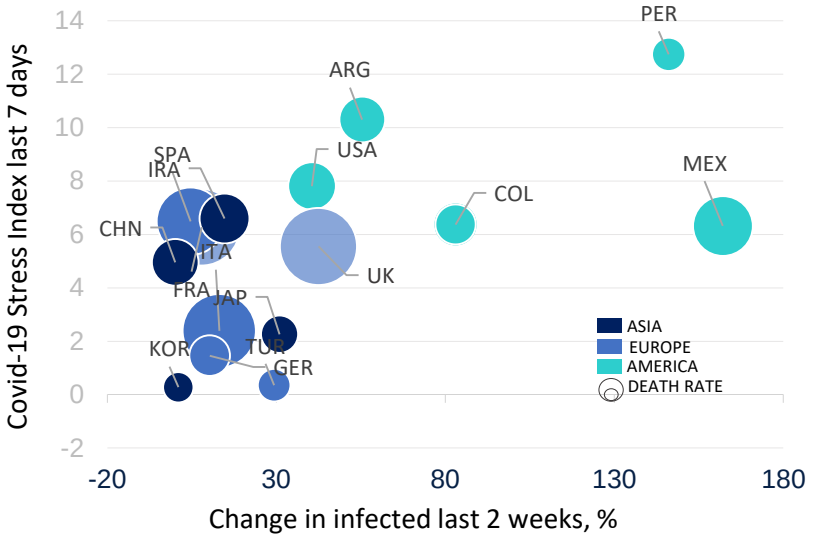
HEALTH

Covid-19 Media Stress Index has eased off worldwide during last days, which is positively correlated with the number of new infected people

MEDIA STRESS INDEX OF CORONAVIRUS OUTBREAK* BY REGION (STANDARDIZED DATA)



MEDIA STRESS INDEX OF CORONAVIRUS OUTBREAK* AND NEW INFECTED PEOPLE



Updated until 4 May

(*) Tone in the media weighted by coverage. Standardized series in moving average 3 days. Global index includes worldwide media sources. Asian index is an average for Korea, Japan Iran and Singapore. European index is an average for Italy, Germany, France, Spain and UK. Latam index is an average Mexico, Brazil, Argentina, Colombia and Peru.
The indicators include the relative ratio on news speaking about coronavirus compared with the rest of commented topics in the media of each country. Then, the indicator is multiplied by the tone of the article to weight the importance of the topic. The index is presented in absolute values. Series are standardized

Source: BBVA Research, GDELT

ECONOMICS

Impacts of Covid-19 on the economic activity become important concerns as health crisis is more controlled

MAIN TOPICS APPEARING IN NEWS RELATED TO **CORONAVIRUS** AND **ECONOMY**

Labor markets, equity markets and oil have been severely affected. Efficient fiscal and monetary policies are the key for recovery.

MEXICO

USA

SPAIN

Focusing on countries, **oil is one of the topics that highlights in the case of Mexico**, while in the case of **Spain, tourism is more relevant**. **Unemployment is in the spotlight in the case of the US.**

Updated until April. Crisis is the most mentioned topic in every region, after economics. However, it has been removed from the wordclouds in order to rescale the rest of the topics and analyse which are the major concerns globally and by country.

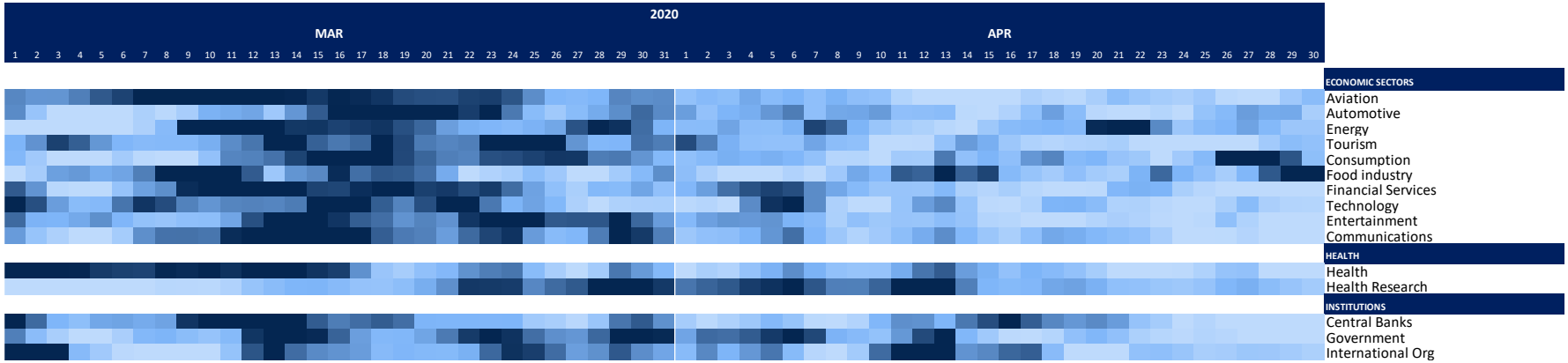
Source: BBVA Research, GDELT

ECONOMICS

While economic sectors suffer demand and supply shocks, the health sector and institutions try to mitigate the crisis with interventions

MEDIA SENTIMENT ACROSS SECTORS IN NEWS RELATED TO CORONAVIRUS WORDWIDE

(Tone in the media. 3-day moving average. Light blue means more positive sentiment and dark blue means more negative)



The indicator is the tone on news speaking about coronavirus by sector of activity. The most related firms that appear in news articles speaking about coronavirus were selected. The following number of firms and organizations are considered for each group: Aviation 66, Automotive: 33, Central Banks: 28, Communications: 77, Consumption: 71, Energy: 43, Entertainment: 35, Financial Services: 110, Supermarkets: 46, Health: 402, Technology: 56, Tourism: 49, International Organizations: 34, Government: 422, Health Research: 249. See Appendix for more details.

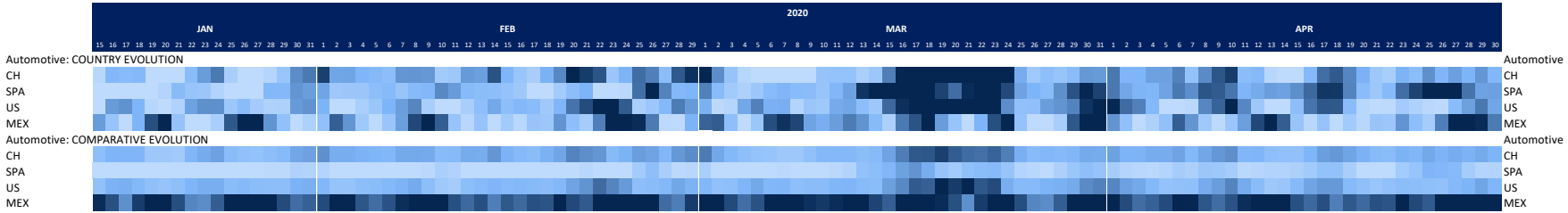
Source: BBVA Research, GDELT

- Economic sectors exhibit a heterogeneous sentiment and **all share their most negative tone between the first and third week of March**, due to the pandemic spread outside China. It reflects the impact of the negative shock with respect to the previous scenario.
- **Health related sectors reflect the fight to control the situation**, which is now less complicated than in the previous weeks. Health Research shows efforts by scientists to discover cures and vaccines against Covid-19.
- Central Banks' associated sentiment might indicate a **pass through of the debate to the economic consequences about Covid-19 crisis**. Governments fight Covid-19 with social, fiscal and labor market policies.

ECONOMICS

Mexican automotive sector reacted the first and the most in response to shutdown measures of production in China

MEDIA STRESS INDEX: AUTOMOTIVE SECTOR EVOLUTION (3-day ma, standardized series. Top figure represents the media response of each country. Bottom figure represent the joint comparison of sectoral evolution in the four countries. Light blue means lower level of stress and dark blue means higher levels)



This index uses the GKG database (GDELT) and compiles the average tone and coverage of news in national media associated with organizations in selected sectors. To build indicators the most relevant set of media in each country is considered. The stress index is calculated with the average tone weighted by coverage. The number of automotive-related firms considered by country is the following. China: 17, Spain: 12, US: 20 and Mexico: 20. Firms that are mentioned in news that accumulate 80% of the total information or contribute with more than 0.09% are selected. See Appendix for more details.

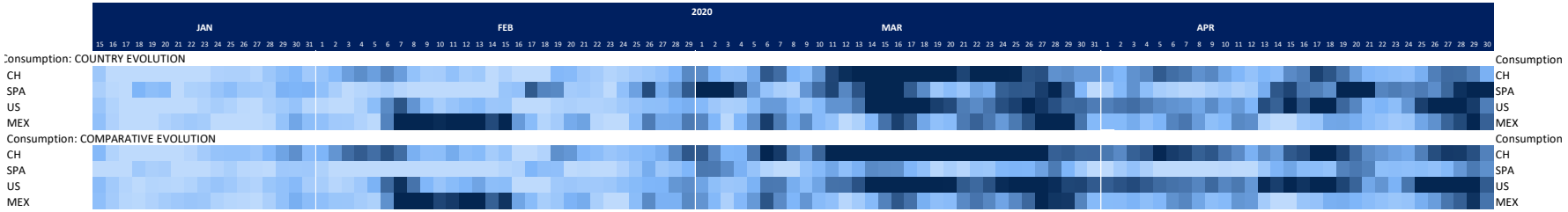
Source: BBVA Research, GDELT

- **There is a correlation in the automotive sector stress in the media and the contagion evolution**. Early signals in Mexico show the connection of the global value chains in this sector.
- The most intensive and synchronized stress episode coincides with **massive announcement of the shutdown of production lines by firms in the sector**.
- China and Mexico show intermittent stress episodes since the mid-January that spread to Spain and the US at the end of February.
- **The US, China and Mexico exhibit a greater synchronization and similar intensity compared with Spain, which is more related to other global value chains**.

ECONOMICS

Consumption media stress evolves in line to the COVID-19 contagion, with the US and China exhibiting the most intense and persistent index

MEDIA STRESS INDEX: CONSUMPTION SECTOR EVOLUTION (3-day ma, standardized series. Top figure represents the media response of each country. Bottom figure represent the joint comparison of sectoral evolution in the four countries. Light blue means lower level of stress and dark blue means higher levels)



This index uses the GKG database (GDELT) and compiles the average tone and coverage of news in national media associated with organizations in selected sectors. To build indicators the most relevant set of media in each country is considered. The stress index is calculated with the average tone weighted by coverage. The number of consumption firms considered by country is the following. China: 14, Spain: 8, US: 18 and Mexico: 16. Firms that are mentioned in news that accumulate 80% of the total information or contribute with more than 0.09% are selected. See Appendix for more details

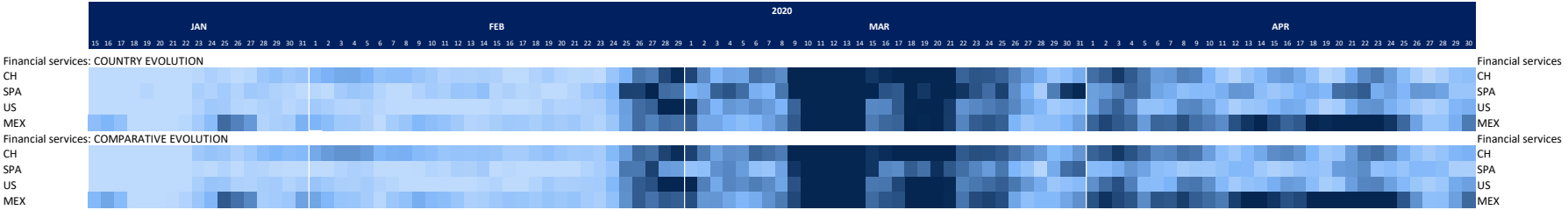
Source: BBVA Research, GDELT

- Stress in consumption sector started in China at the beginning of February and propagated to the US and Spain as declaration of states of emergency advanced. Mexico is an exception.
- **In the US and China the stress path is similar, in both timing and intensity, and highly persistent.**
- **The stress pattern for Spain is intermittent but with intense episodes.**

ECONOMICS

Financial sector media stress reflects the interconnection of financial markets through a synchronized reaction with similar impact in media

MEDIA STRESS INDEX: FINANCIAL SECTOR EVOLUTION (3-day ma, standardized series. Top figure represents the media response of each country. Bottom figure represent the joint comparison of sectoral evolution in the four countries. Light blue means lower level of stress and dark blue means higher levels)



This index uses the GKG database (GDELT) and compiles the average tone and coverage of news in national media associated with organizations in selected sectors. To build indicators the most relevant set of media in each country is considered. The stress index is calculated with the average tone weighted by coverage. The number of financial institutions are the following: China: 45, Spain: 24, US: 47 and Mexico: 52. Firms that are mentioned in news that accumulate 80% of the total information or contribute with more than 0.09% are selected. See Appendix for more details

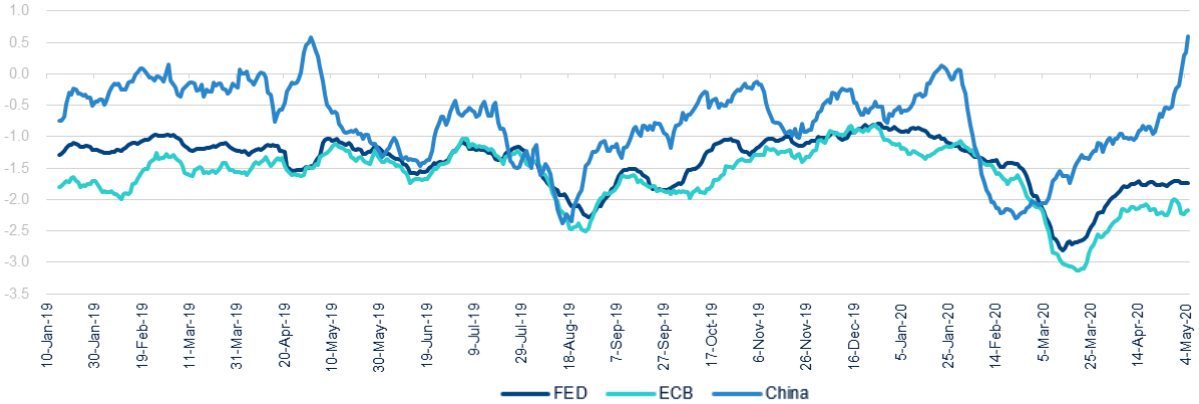
Source: BBVA Research, GDELT

- There is a **synchronized evolution in the financial sector that reflects the connection of financial markets**. As a result, fear propagates rapidly across markets. They show a common response regardless differences in infection levels per country.
- The darkest color at the beginning of March (9th) illustrates the **Black Monday for the stock markets**, when they fell the most. March 12th was also a day with steep falls. **Oil war between Russia and OPEC** aggravated the falls in the stock markets.
- **The four countries present a similar media stress response in both timing (top figure) and intensity (bottom figure).**

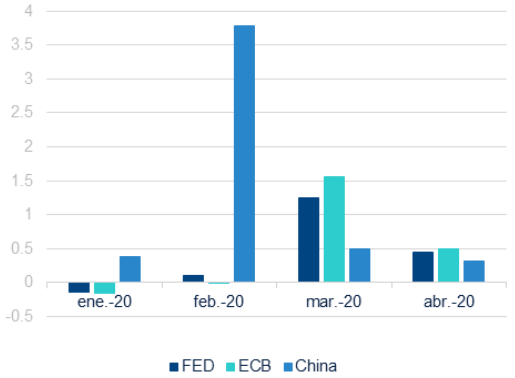
ECONOMICS

Economic support through monetary policy shows a synchronized response reflected in media sentiment

MONETARY POLICY AND SUPPORTING MEASURES SENTIMENT FOR CENTRAL BANKS RESPONSES TO COVID-19 PANDEMICS (15 DAY-MA)



MONTH ON MONTH MEDIA COVERAGE (MoM 2019-20)



Source: BBVA Research, GDELT

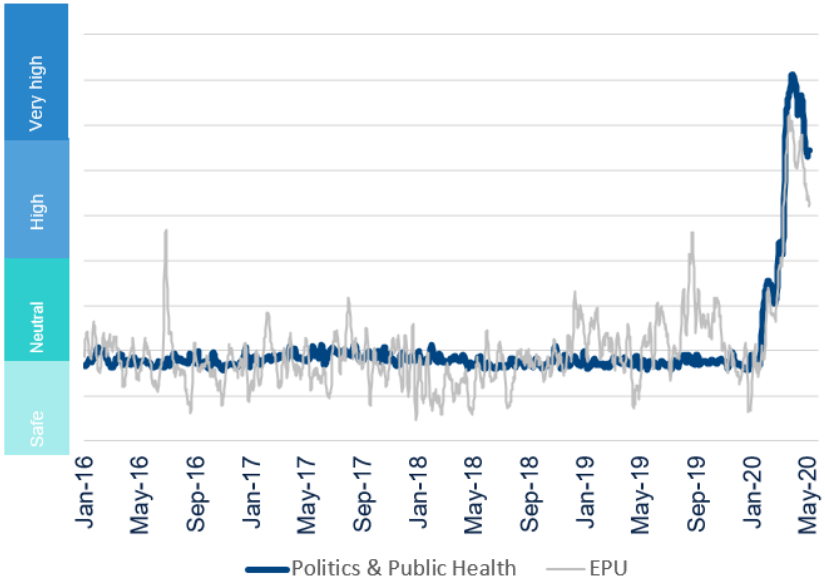
- Over time, Central Banks' associated sentiment shows a **consistently more positive tone for the Central Bank of China**, according to global media tone.
- There is a **synchronized response for the Fed and the ECB** as well as an early reaction from the Central Bank of China, reflecting timing in the evolution of contagion.
- **After registering the minimum, the Central Bank of China presents a markedly upward, which is not the case for the ECB and the FED yet**.
- The **coverage** (on the right) represents amount of news mentioning these central banks, relative to the same month in the previous year. It **illustrates the sequence of the Covid19 infection spread across the countries considered.**

POLITICS

The assessment of past political decisions and the claims for new interventions to mitigate the impact of Covid-19 are emerging

SOCIETY KEEPS A CLOSE EYE ON **GOVERNMENTS** TO ASSESS THE **EFFECTIVENESS OF THEIR DECISIONS** TO FIGHT THE PANDEMIC

POLITICS AND PUBLIC HEALTH STRESS INDEX BASED ON THE MEDIA (100 = 17 NOV 2019)



- **Governments' policies are key in the development of the crisis**. In consequence, they are being closely monitored.

Source: BBVA Research, GDELT

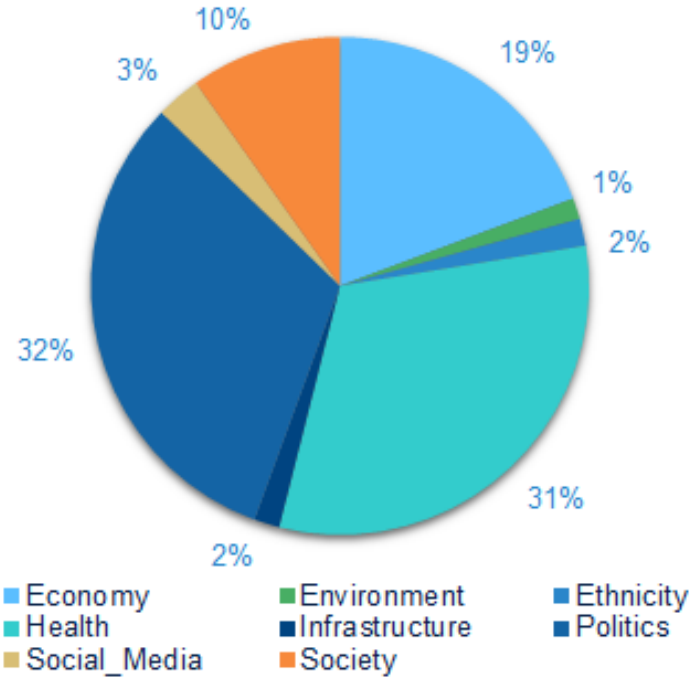
- **Economic Policy Uncertainty is at high levels due to the pandemic and the politics and public health stress index is even higher.**

Source: BBVA Research, GDELT

POLITICS

Politics has become one of the major issues related to coronavirus according to the media

TOPIC DISTRIBUTION IN NEWS ARTICLES RELATED TO CORONAVIRUS



Source: BBVA Research, GDELT. Updated until April

- **As the virus evolves, most discussions reflected on media involve politics, specifically a 32% of them**. Measures taken by the governments are key in the management of the crisis.
- **Health is the other main issue in news related to coronavirus**. The evolution of the virus, as well as the progress of vaccines and cures, is being constantly monitored by media. These topics represent a 31% of the total.
- Other key categories are **economy**, analized before, and **society** (vulnerable groups, tourists, students, crime, etc.), consisting of 19% and 10% of the topics respectively.

POLITICS

The evolution of the political stress index differs by country

China

Jan 30: Virus reaches every Chinese region and causes more than 200 deaths

Apr 7: Wuhan's coronavirus lockdown ends after 76 days

Mexico

Mar 24: Mexico's president popularity worsens as he downplays the crisis

Mar 30: Shutdown ordered to all private and public non-essential activities

Spain

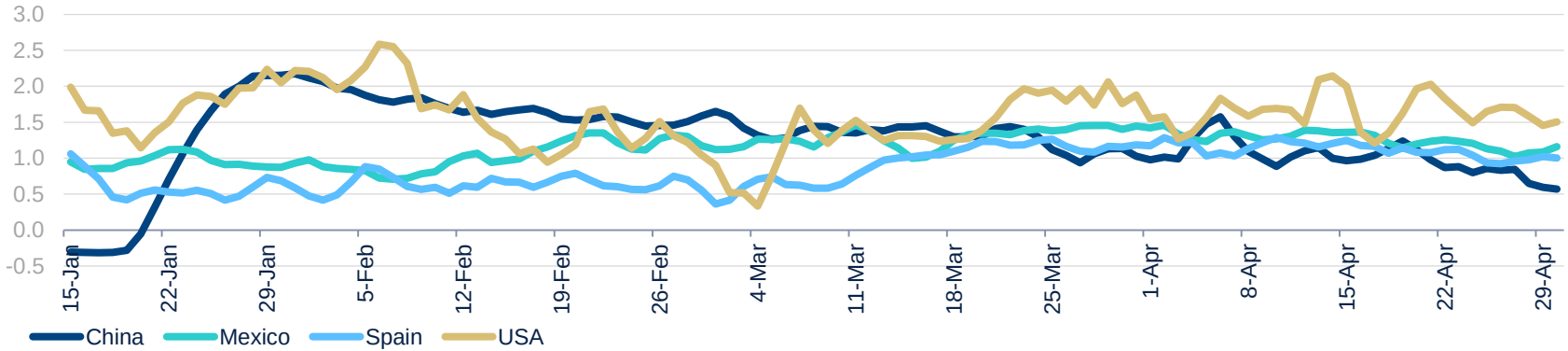
Mar 26: Spain buys tests from an unlicensed Chinese company

Apr 1 - 2: Spain records deadliest day yet. Coronavirus crisis brings worst March on record for Spain's labor market

USA

Feb 6: Planeloads of Americans flee coronavirus outbreak in Wuhan

Apr 14: Trump halts WHO funding

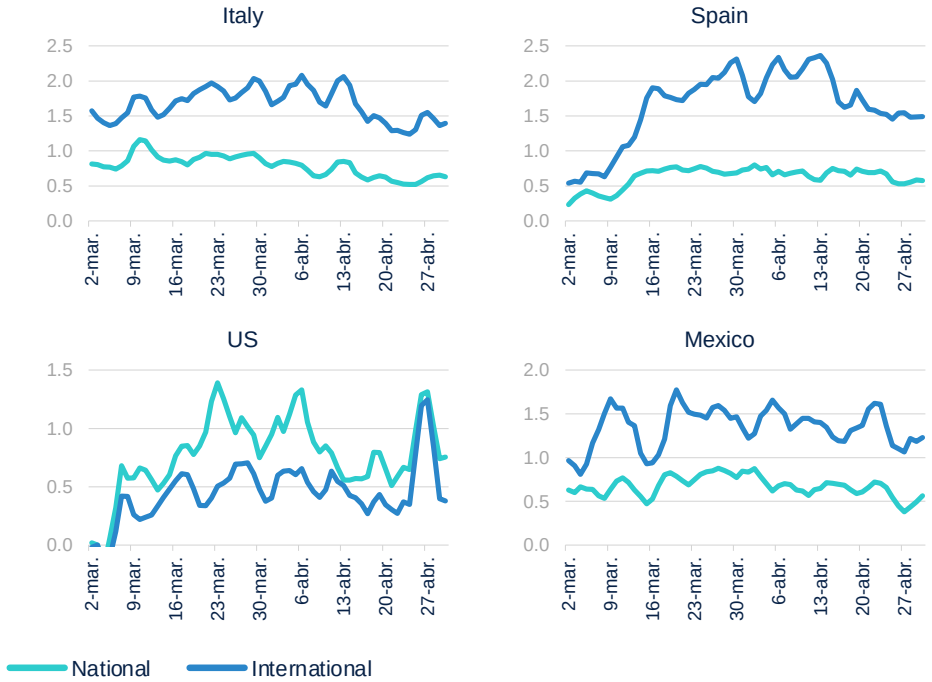


The index is (-Tone)*Coverage, 3 days MA, of news related to politics in the media. Only national media is taken into account.
More specifically, news in which the most commented topics related to coronavirus and politics are mentioned.

Source: BBVA Research, GDELT

POLITICS

All countries present a bias between what is said about their government in national media compared to what is said abroad



The press indicator is (-Tone)*Coverage, 3 days MA, in media of news related to the government of each of the countries.
The National Index takes into account only the country's media and the International Index includes news from all media except the country's own media.

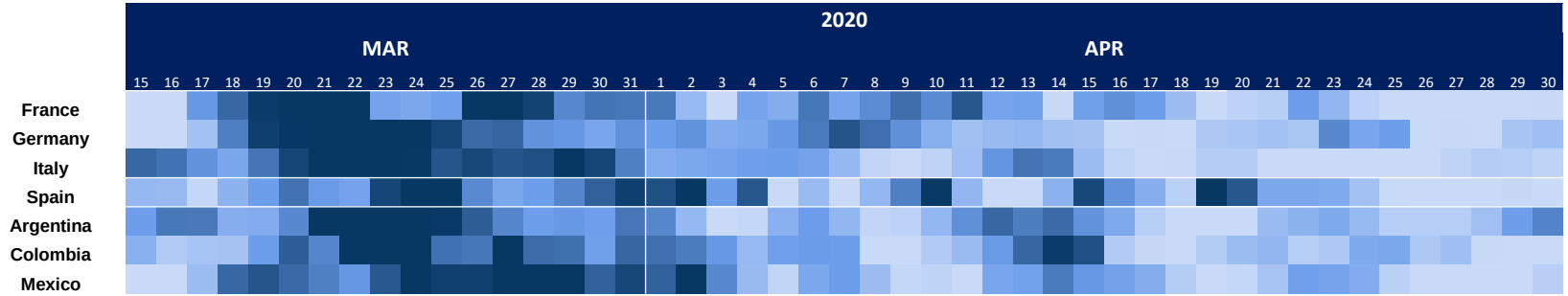
Source: BBVA Research, GDELT

- **Italy and Spain show a large bias in national vs international media** sentiment towards governments' measures, **Spain presenting the widest gap** among them.
- **In the US,** in contrast to the rest of the countries, **the perception of the government's measures is better abroad** than domestically.
- In the case of Mexico, **the perception of the international media is worse** as in the case of the European countries.

POLITICS

As countries step into the second phase and governments start lifting lockdown measures, the sentiment in the media improves

NATIONAL MEDIA SENTIMENT TOWARDS GOVERNMENTS (Light blue means more positive sentiment and dark blue means more negative)



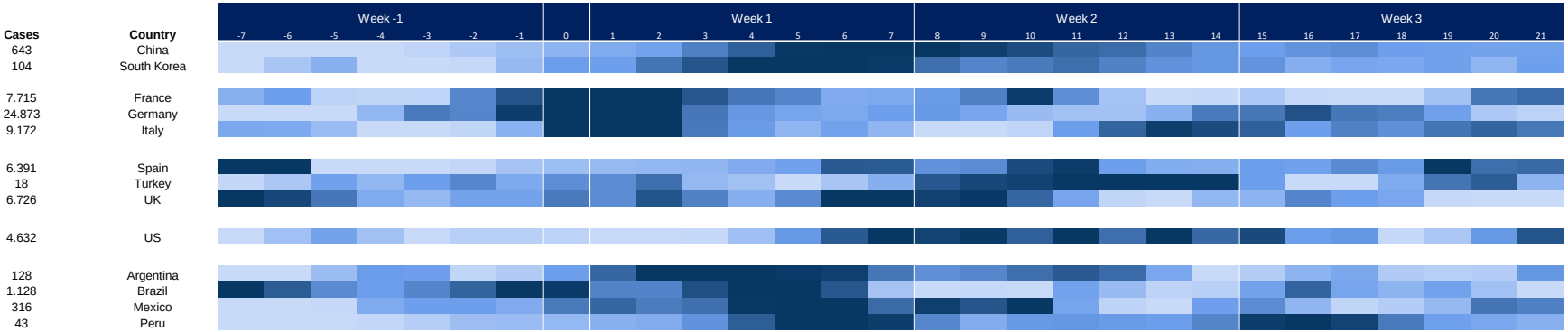
The indicator is the tone on news related to governments and measures taken to fight the virus, with a 3-day MA.
Source: BBVA Research, GDELT

- **In countries whose governments have announced exit plans, national media is more optimistic.** This is the case of Germany and France, where schools will reopen in early May and, in Germany, some shops have restarted trading since April 20.
- **The uncertainty in the Spanish scenario is reflected on the media.** The sentiment has not yet shown a clear improvement.
- In **Argentina and Colombia,** which were among the earliest to start confinement in LATAM, the governments **have also announced second phase's plans.**
  - In Argentina, some non-essential activities restarted on April 13.
  - In Colombia, the quarantine ends on April 27 and productive activity will restart that day. As a result, national press shows a better tone except for the announcement of a scarce supporting package of credit guaranties (April 14th).

POLITICS

Political stress previous to lockdown measures adopted by governments varies across countries

TIME LAPSE BETWEEN POLITICAL STRESS AND CONFINEMENT MEASURES (Day zero is the day confinement was imposed)



For some countries, which were reluctant to this measure, it is the day special action was taken to fight the virus. Color intensity represents the stress in media related to politics. The darker the blue, the worse the sentiment. Sentiment is (-Tone)*Coverage, 3 days MA. Countries are not compared with each other. A darker blue means a worse sentiment compared to other days' sentiment in the same country.

Source: BBVA Research, GDELT

- **Asian countries**, where the virus is currently controlled, **showed political stress right after the confinement measures but not before**.
- **Germany** had the highest number of cases when action was taken, after previous days of increasing political stress. However, they have avoided collapse of the healthcare system and their reported fatality rate is among the lowest.
- Political stress previous to the lockdowns was relatively high for **Spain, UK and Brazil**.

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ANNEX

Heatmaps methodology

The analyzed information included in the heatmaps presented in slides 7 to 10 could be summarized with the following procedure:

- The sample of selected firms for the global and country-specific heatmaps are independent according to the distribution obtained in each query (global queries are done without asking for a particular country to appear in the news articles)
- All the firms have the same importance for computation purposes.
- For the global analysis (slide 7), in each category, we rank firms based on their mentions in news. Then, firms that are mentioned in news that accumulate 80% of the total information, or contribute with more than 0.09% to the total, are selected to compute their coverage and tone associated. A total of 2,017 organizations and institutions are classified. In order to compare the impact of Covid-19 by economic sectors, health sectors and institutions, we consider the associated tone.
- For country-specific analyses (slides 8 to 10), new queries, requesting that the country appears in the news articles, are performed in order to account only for the most important domestic media sources. The index represents, now, the tone weighted by the relative coverage, since we are representing only a single sector per heatmap. The number of selected firms varies by country.

- Two analyses are presented:
  - The top figures compare the sector in each country with its own past history. We aim to illustrate the synchrony of the events reflected in media.
  - The bottom figures try to present a comprehensive picture of the sector for the 4 countries together. This outcomes is useful to find out which country has been attracted the most media stress.