Measuring consumers' inflation expectations and second round effects using data from the media
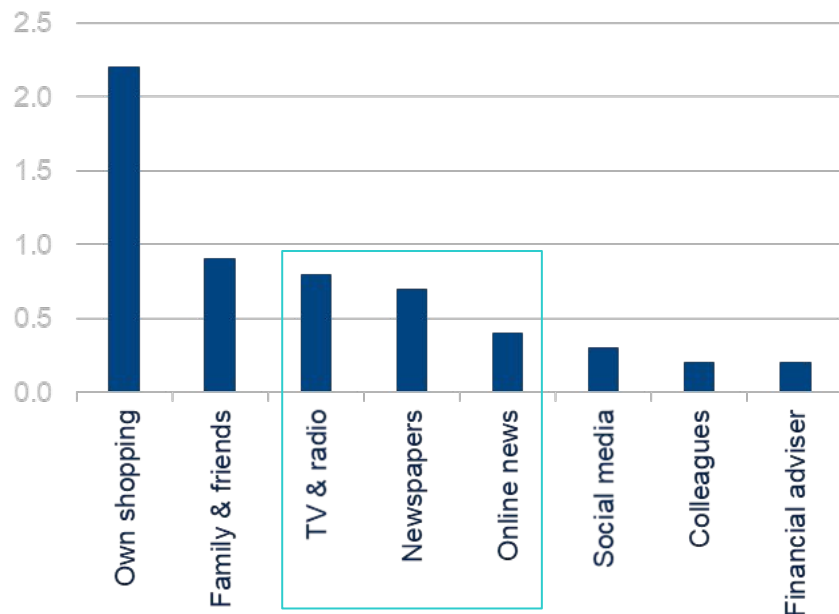
November 2022

Main Takeaways

- Media is a relevant source of information for **households to form their inflation expectations**

- We identified salient products from CPI basket and built **a high frequency news based indicator (GDELT) to monitor the volume of news about "salient" goods prices by geography**

- Our news based indicator has a high correlation with other inflation expectations surveys

- We also extend the analysis to capture **firms' inflation expectation**s monitoring **second round effects in the media**, disentangling between wage or salary costs, oil or fuel costs, energy and electricity costs and financial costs

Media (News, TV & Radio) is one of the main sources of information for households to form their expectations

SOURCES OF INFORMATION FOR INDIVIDUAL'S INFLATION EXPECTATIONS
(Information sources ranked by survey respondents)

Notes: Their first source is assigned a value of 3, second source a value of 2 and third source a value of 1
Source: D'Acunto et al. (2019) based on the Chicago Booth Expectations and Attitudes Survey

- Inflation expectations shape consumers' decisions such as type of consumption, savings, investment, and wage bargaining.

- How expectations of future inflation are formed by households is a key issue and can diverge from market and analysts.

- Media is a relevant source of information for households to form their expectations but not the main one. Own Shopping matters.

- We analyze how the volume of inflation-related news mimic consumer's inflation expectations.

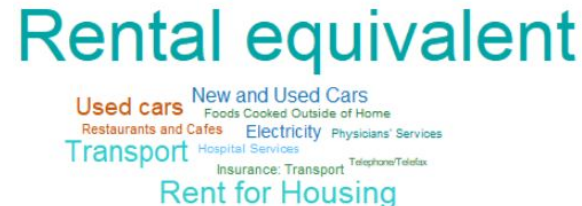# Identifying salient products from CPI basket: we see that rent is critical in USA, while restaurants are especially relevant in Italy and Spain

Source: BBVA Research with data from Haver
The size of the words represent the share of each product and service in the CPI basket
*/ In the case of Mexico, in addition to the goods suggested by their weight in the CPI in the case of mexico we consider the +20 products chosen as part of the agreement in the agreement to combat inflation launched by the mexican government in May-22 in addition to gasoline prices that were already subsidized.

We built a high frequency news based indicator (GDELT) to monitor the volume of news about "salient" goods prices by geography

US

FRANCE

diesel, housing rent, natural gas, household, bread, water supply, food, meat, milk, fruits, medical, restaurants, vegetable, mobile services, travel, clothing, international tourism, vehicle

MEXICO

tortilla, chicken, milk, eggs, pork, tomato, potato, beans, sugar, bread, rice, onion, lemon, food, gasoline, gas
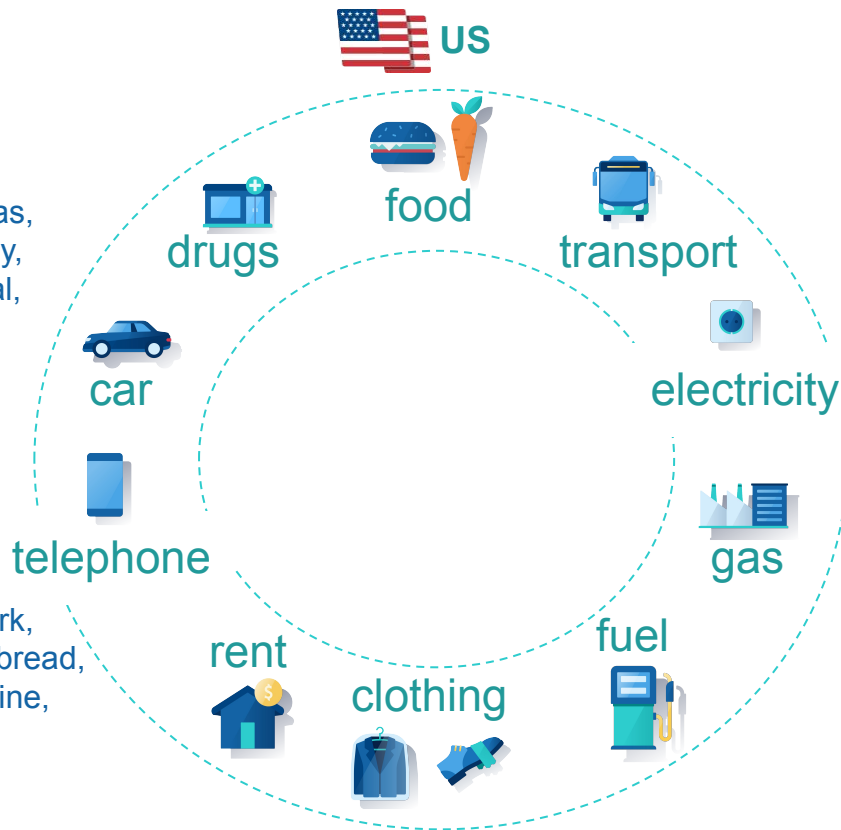
SPAIN, ITALY AND GERMANY

diesel, housing rent, natural gas, household, bread, car, water supply, meat, milk, fruits, medical, restaurants, olive oil, vegetable, mobile services, travel, clothing, international tourism, vehicle

food

drugs

transport

car

electricity

telephone

gas

rent

clothing

fuel

+ "prices" in the vicinity of distance (10 words)

+ "Econ_inflation" as a general term

The news based inflation index: the Russia-Ukraine war triggered a rise of the index in all countries. It remains high but easing in some of them
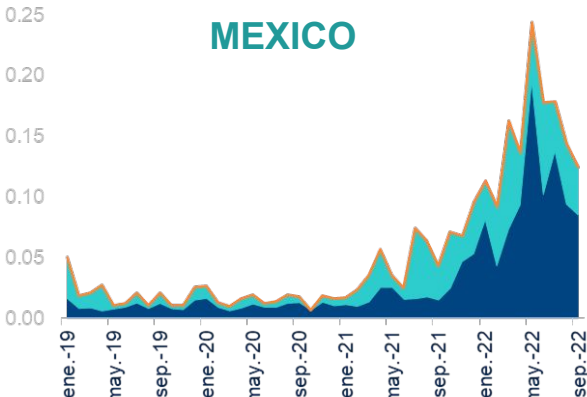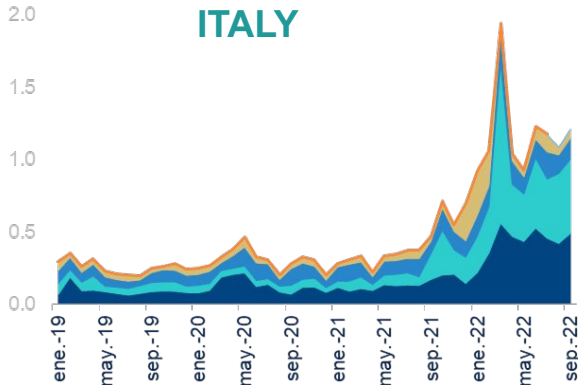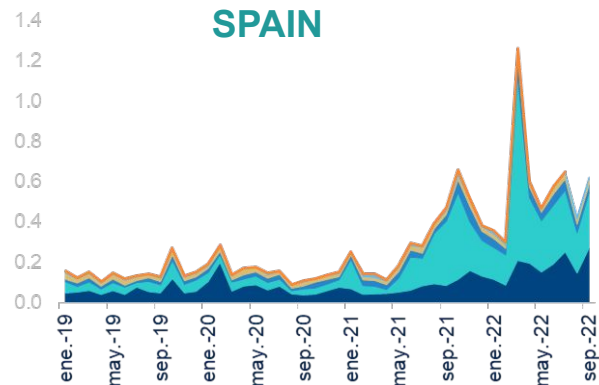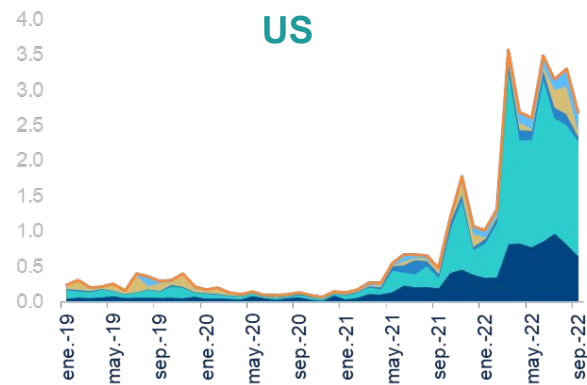
NEWS-BASED INFLATION EXPECTATIONS INDICATORS BY COUNTRY Normalized (mean 0, std. Dev 1)
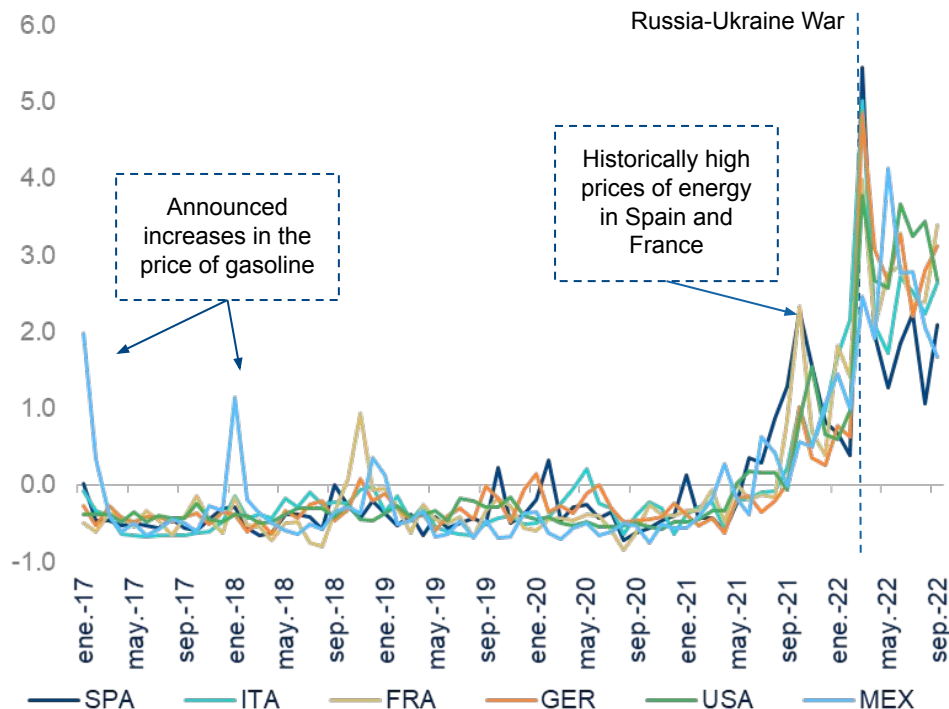
- News based inflation expectations indicators started to rise in tandem during the second half of 2021

- France and Spain had a first peak at the end of 2021 as a result of the increasing prices in electricity

- Expectations spiked in all countries as the war in Ukraine began

- The upward trend appeared to ease since the summer of 2022

Source: BBVA Research with data from Gdelt

The COVID hasn't changed the traditional presence of some goods on inflation related news: Energy and Food prices keep relevant presence
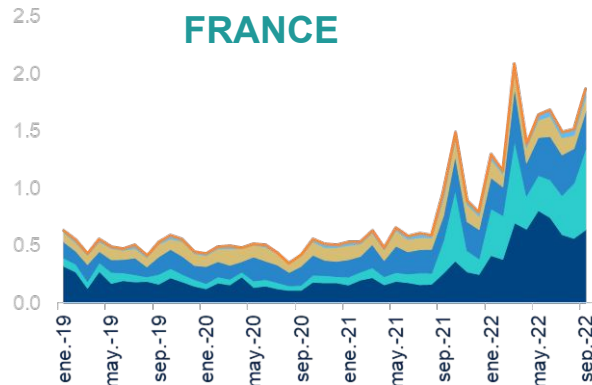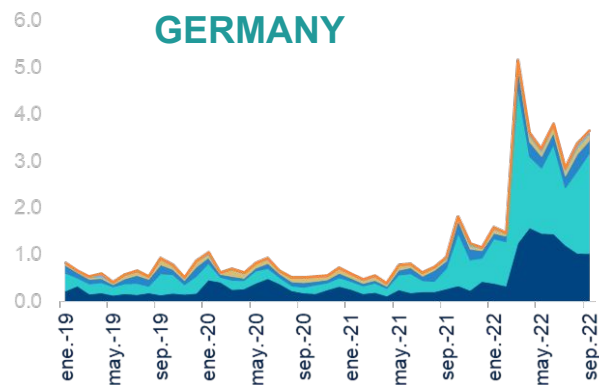
Source: BBVA Research with Gdelt data

Food   Energy   Transport   Miscelaneous   Housing   News based index

Our news based indicator has a high correlation with other inflation expectations surveys: Consumer, Business and Analysts

Correlations of GDELT based index and other inflations measures

Observed inflation

	SPA	ITA	FRA	GER	Euro Avg	USA	MEX
Pre-Covid	-0.1	0.3	0.1	0.1	0.2	-0.1	0.1
Post-Covid	0.7	0.6	0.4	0.9	0.7	0.1	0.8
All the sample	0.8	0.7	0.5	0.9	0.8	0.5	0.7

Consumer inflation expectations

	SPA	ITA	FRA	GER	Euro Avg	USA	MEX
Pre-Covid	0.2	-0.1	0.2	0.5	0.5	0.1	0.4
Post-Covid	0.9	0.9	0.9	0.9	0.9	0.7	0.8
All the sample	0.8	0.9	0.8	0.8	0.9	0.8	0.4

Business inflation expectations

	SPA	ITA	FRA	GER	Euro Avg	USA	MEX
Pre-Covid	0.0	0.0	0.2	-0.1	0.0	0.1	NA
Post-Covid	0.7	0.7	0.8	0.7	0.8	0.9	NA
All the sample	0.8	.	0.8	0.7	0.8	0.9	NA

Analysts inflation expectations

	SPA	ITA	FRA	GER	Euro Avg	USA	MEX
Pre-Covid	NA	NA	NA	0.1	-0.3		0.2
Post-Covid	NA	NA	NA	0.8	0.8		0.8
All the sample	NA	NA	NA	0.6	0.8		0.8

Source: BBVA Research with data from Gdelt and Haver
Pre-covid period corresponds to Jan-17 to Feb-20. Post-covid period is from Jan-21 to Sep-22

- News based expectations indicator has a high correlation with consumer expectations in the EU and USA.

- In Mexico, highest correlations come from the observed inflation and analysts' sentiment. In the US, business and analyst expectations show higher correlation.

- That could be due to individuals forming their expectations primarily from a different source (like shopping experience) or that media is mainly reflecting the analysts and business point of view.

News based indexes capture reasonably well Consumer expectations in surveys in most countries

GERMANY

FRANCE

SPAIN

ITALY

— News based index — Consumer expectations (rhs)
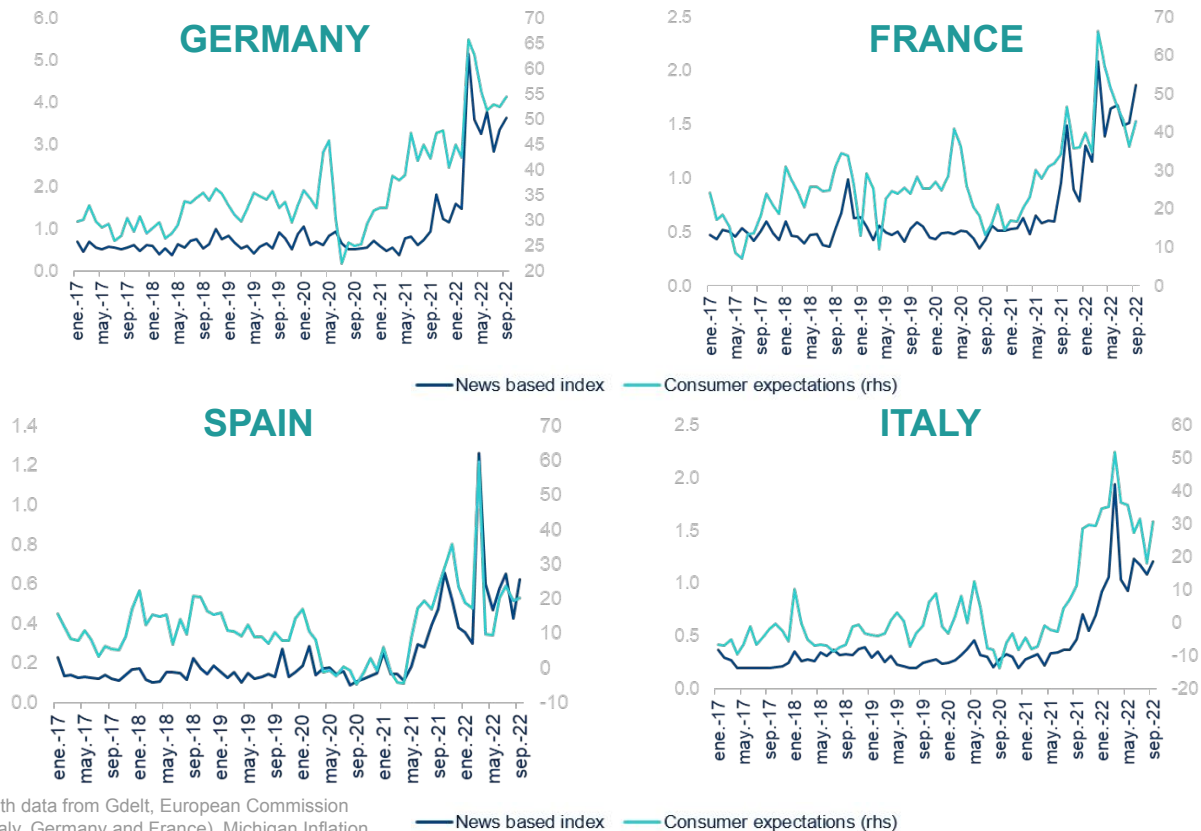
Source: BBVA Research with data from Gdelt, European Commission consumer survey (Spain, Italy, Germany and France), Michigan Inflation Expectations Index (US) and INEGI Consumer Confidence Index (Mexico)

The volume of news on transportation services, energy and food are the ones that better mimic households inflation expectations in surveys

CORRELATION COEFFICIENTS

	Food	Energy	Transport	Miscell. 1/	Housing	Total
Pre-Covid period (Jan 2017- Feb 2020)						
United States	-0,1	0,3	0,6	-0,1	0,5	0,2
Germany	0,1	0,6	0,4	-0,4	0,3	0,6
France	0,0	0,5	0,5	-0,1	0,1	0,4
Spain	0,4	0,5	0,3	-0,3	0,6	0,6
Italy	0,1	0,1	0,0	0,0	-0,2	0,1
Mexico	0,3	0,3	N.D.	N.D.	N.D.	0,3
Post-Covid (Jan 2021 - Sep 2022)						
United States	0,8	0,7	0,7	0,3	0,6	0,7
Germany	0,8	0,9	0,9	0,6	0,7	0,9
France	0,8	0,7	0,9	0,6	0,7	0,9
Spain	0,6	0,9	0,8	0,4	0,0	0,9
Italy	0,8	0,8	0,8	0,4	0,1	0,9
Mexico	0,8	0,5	N.D.	N.D.	N.D.	0,8
Complete sample (Jan 2017 - Sep 2022)						
United States	0,9	0,8	0,9	0,3	0,7	0,8
Germany	0,8	0,8	0,8	0,4	0,6	0,8
France	0,7	0,7	0,8	0,6	0,7	0,8
Spain	0,5	0,8	0,7	0,3	0,3	0,7
Italy	0,9	0,8	0,8	0,3	0,3	0,9
Mexico	0,3	0,4	N.D.	N.D.	N.D.	0,4

These are the goods with the higher correlation by geography:

🇺🇸 Food

🇩🇪 Transport, fuel, natural gas, food (specifically bread)

🇫🇷 Transport, cars, fuel oil, bread

🇪🇸 Electricity and transport

🇮🇹 Natural gas, electricity and transport

🇲🇽 Food: lemon and milk

Excluding 2020. For Mexico, a different basket of goods was included based on the higher correlation with expectations and with a higher participation of food.
Miscellaneous includes medical services, restaurants, mobile telephony, travel and apparel. Source: BBVA Research with Gdelt data
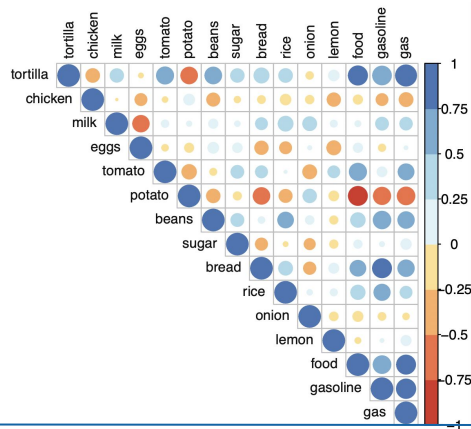
Cross-product inflation related correlations in the media are overall more prominent during the post COVID period in Europe
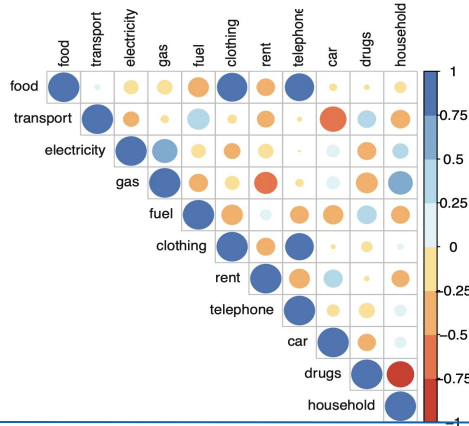

Source: BBVA Research with data from Gdelt
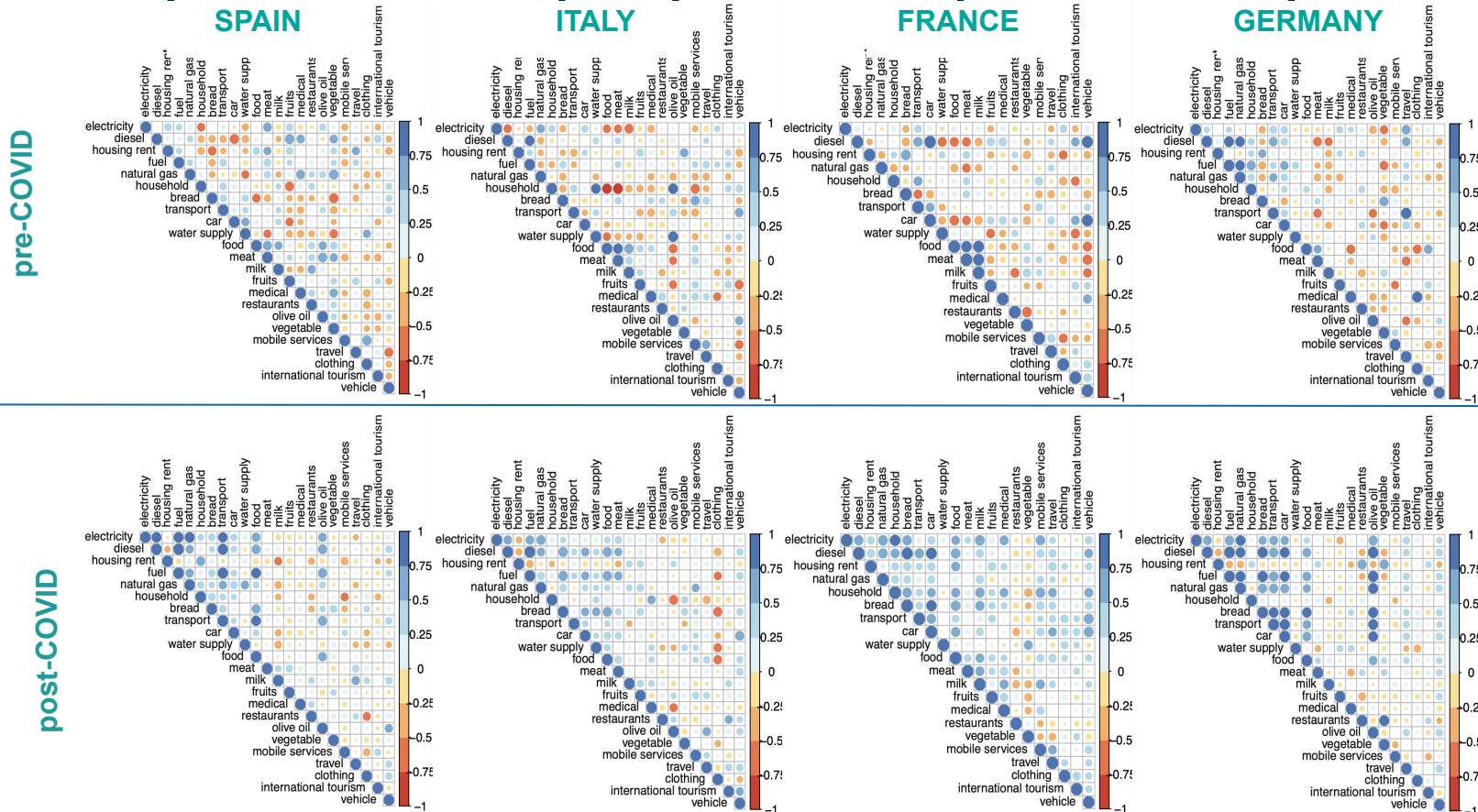
The same happens in the case of North America, especially in Mexico
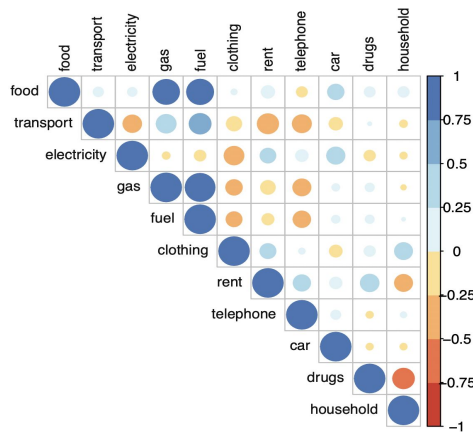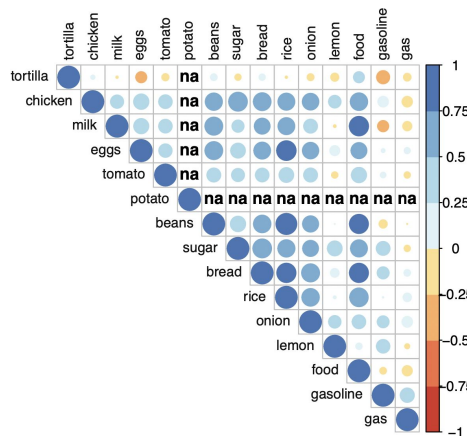

● Inflation mentions in the media regarding basic consumer goods increased

● The inflation discussions are more prominent in Mexico after the convid than in USA.

From the business side, we identify the most relevant costs from the firms. Second round effects on inflation are being monitored

SECOND ROUND EFFECTS INDICATORS BY COUNTRY
(News articles on the trigram "second round effects" and "inflation"/total news articles about economy by country. Normalized data. Moving average 30days)

Source: BBVA Research with Gdelt data
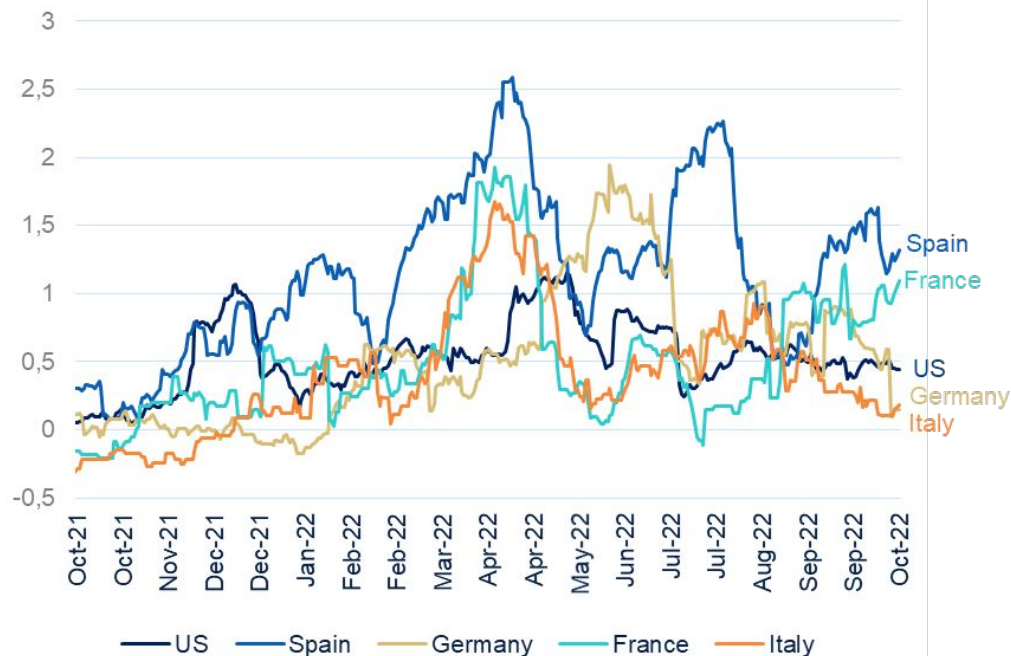
Disentangling between the main associated costs that trigger these effects

Wage or salary cost
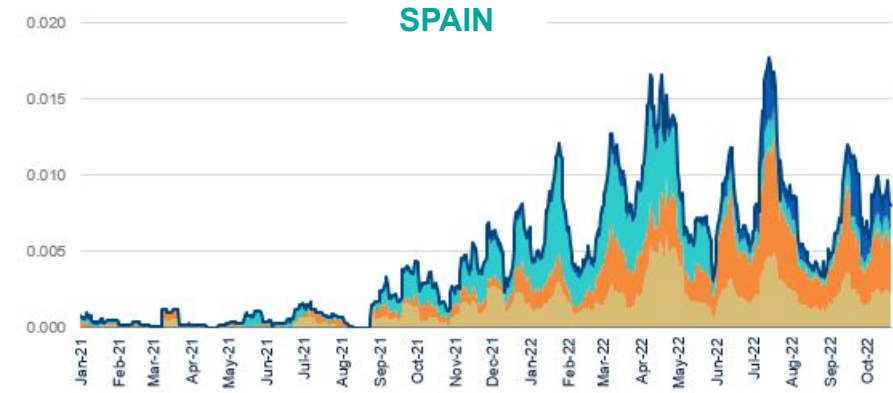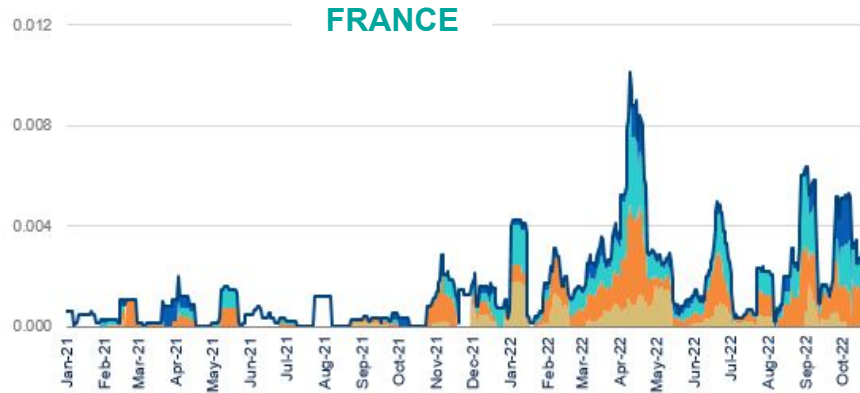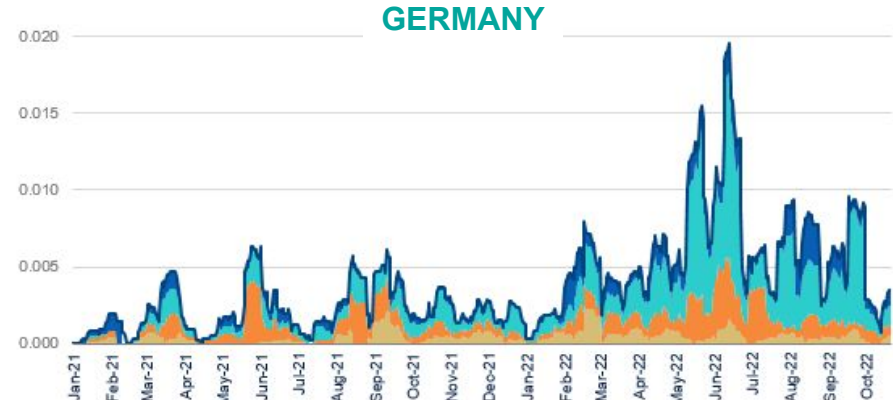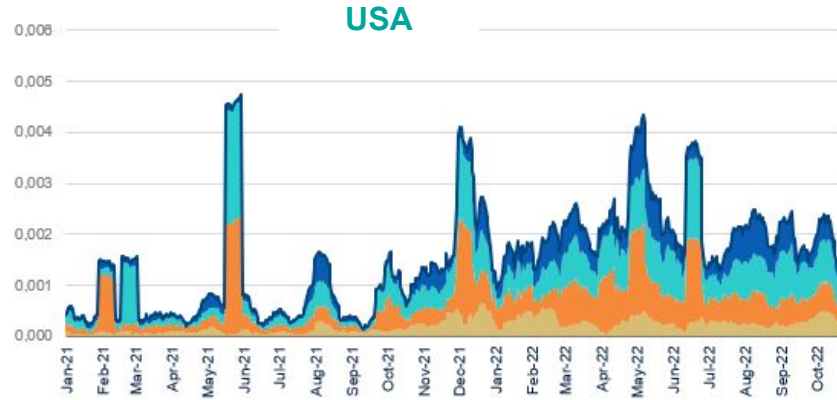
Energy: Fuel or oil cost

Energy: Electricity cost

Financial cost

Electricity and oil cost are the most important ones across geographies. Salary cost is relevant in Spain and financial cost in USA

USA

GERMANY

FRANCE

SPAIN

Wage or salary cost   Fuel or oil cost   Energy or electricity cost   Financial cost   Second round effects

Source: BBVA Research with Gdelt data

Main Takeaways

- Media is a relevant source of information for **households to form their inflation expectations**

- We identified salient products from CPI basket and built **a high frequency news based indicator (GDELT) to monitor the volume of news about "salient" goods prices by geography**

- Our news based indicator has a high correlation with other inflation expectations surveys

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Annex

We followed a methodology to build our inflation expectations indicators

- For each country, we identified the most important products for household consumption and the Consumer Price Index (CPI) basket of goods.
    - We considered the idiosyncrasies of the countries in order to include specific relevant goods (i.e. lemons and tortillas in the case of Mexico*/)

- Using a Python library, we searched for each product in the news, using the GDELT API. We include the theme 'ECON_INFLATION' and the word 'prices' in our queries.

- We used the coverage ratio (number of news in the query/total number of news) as the main indicator. We obtained one indicator per product.

- We add up all the indicators to obtain an aggregated index for each category of products

*/ In the case of Mexico, in addition to the goods suggested by their weight in the CPI in the case of mexico we consider the +20 products chosen as part of the agreement to combat inflation launched by the mexican government in May-22 in addition to gasoline prices that were already subsidized.

Observed inflation can be also diverge from traditional consumer expectation surveys

GERMANY · FRANCE · US · SPAIN · ITALY · MEXICO

YoY% Inflation — Inflation Consumer Survey* (lhs)
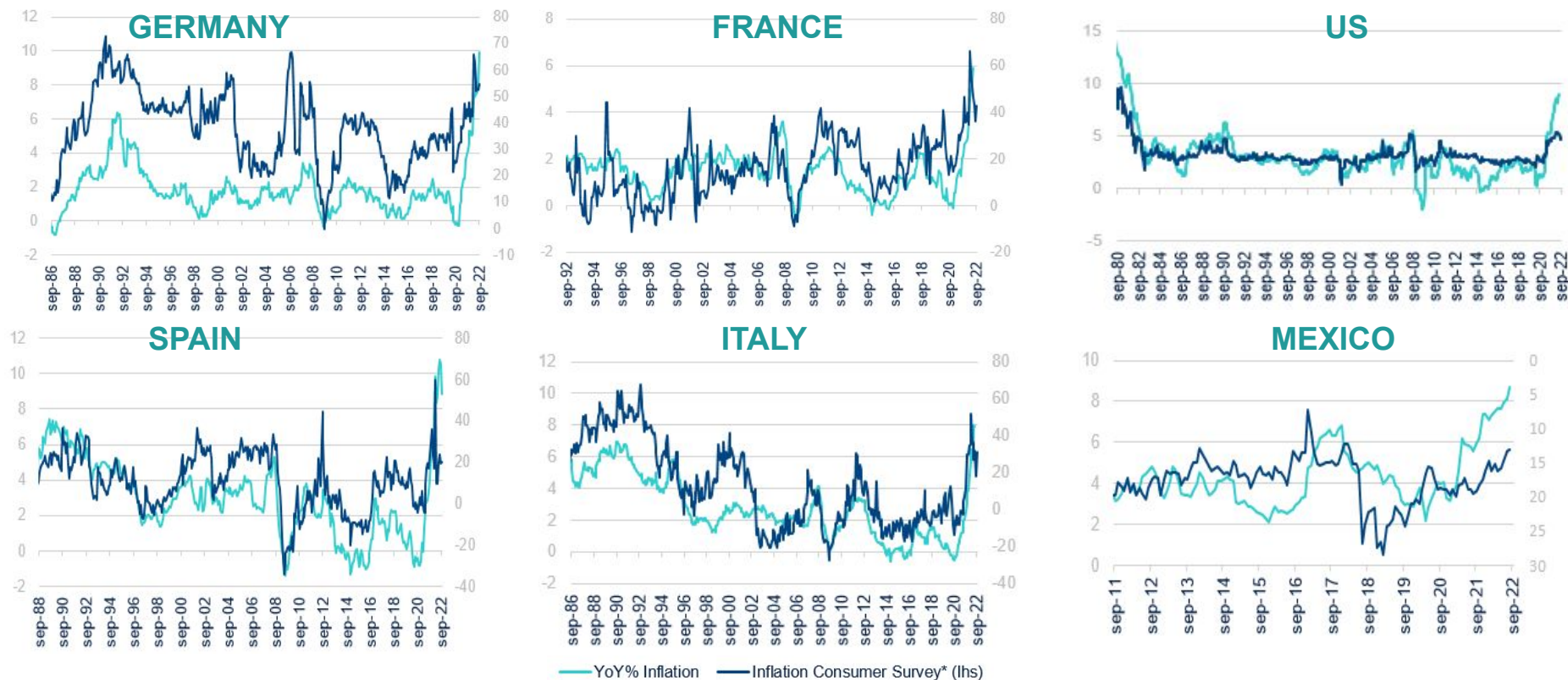
Source: BBVA Research based on European Commission, U of Michigan and Banxico

Inflation Consumer Survey: For GER, FRA, SPA, ITA Consumer's price trends over next 12 months (% Balance), for MEX inverse order of "Compared to previous 12 months, prices in next 12 months (50+=optimistic)

Identifying salient products: Housing in USA & Germany and food for the rest of countries

CPI BASKET DISTRIBUTION BY TYPE OF GOOD (%)
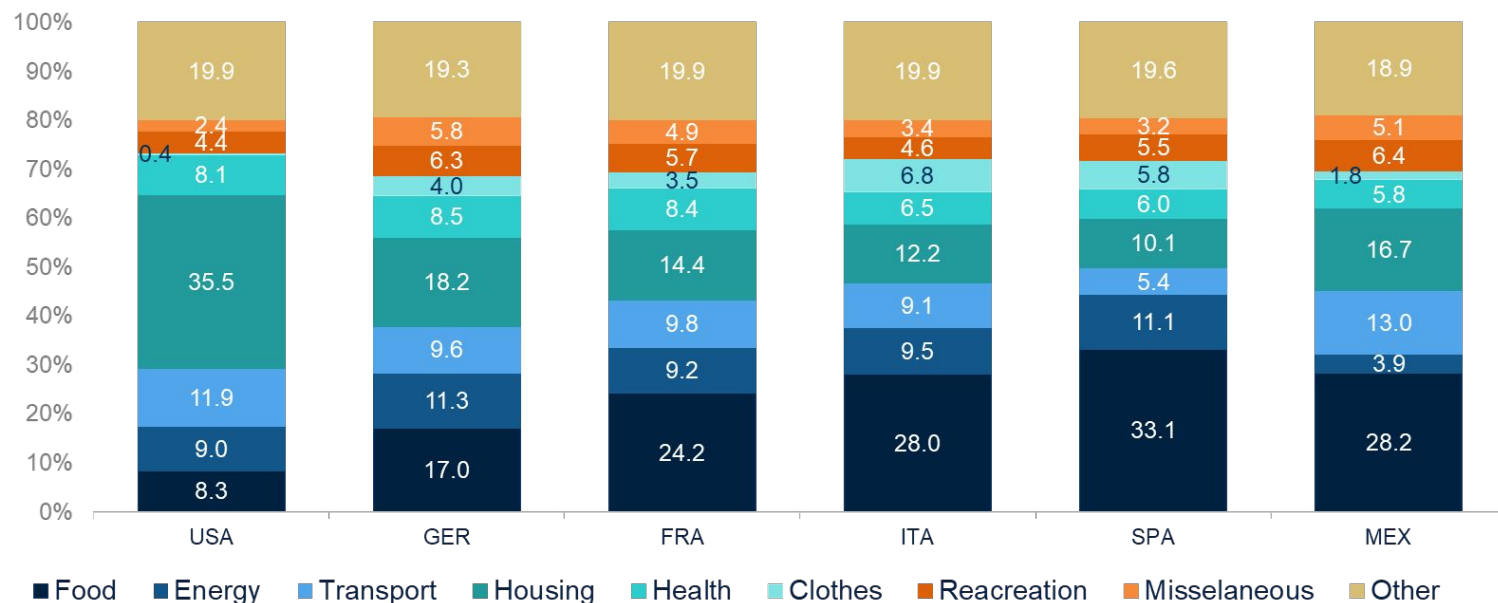
Source: BBVA Research with data from Haver

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Creating Opportunities