BBVA Research

Tracking national tourism flows in real time trough BBVA card spending

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Pamplona, 24th November 2022

Creating Opportunities

Project objectives and methodological guide

Tracking real-time national tourism expenditure flows within Spain at an aggregate level, by regions and provinces through BBVA card spending at daily base

WHY?

- The **high frequency** and **granularity** of the card data allows to **anticipate and complement the official statistics** (based on **surveys of low periodicity and little disaggregation**).

- **Domestic tourism: Key sector** of the Spanish economy for the **recovery process** and important factor **detecting permanent and temporary effects** on the **preferences of Spanish tourists** during the crisis

HOW?

Data: Daily card movements of BBVA customers outside their usual residence from 2018 to present.

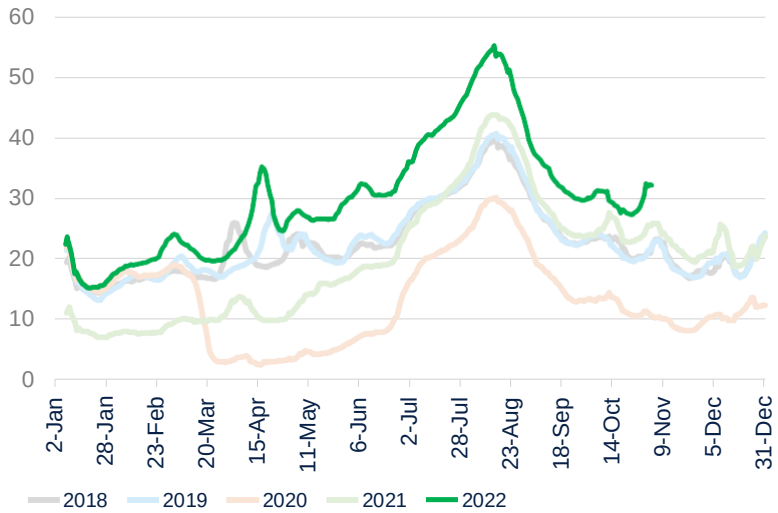
Criteria:

- **Face-to-face purchase transactions** and **cash withdrawals**
- Transactions carried out by **Spanish residents** in **Spanish territory** and **abroad**
- The **usual residence** (province) of a client is **imputed** when his **usual expenditure exceeds 50% outside the province declared** in the bank.

Due to the pandemic, national tourism performed poorly in 2020 and the holidays effect virtually vanished. In 2021, spending started to recover in May and rebounded sharply in 2Q21 thanks to lower mobility restrictions. The tourism recovered 2019 level in 2021 summer and stayed above them during most part of 2022.

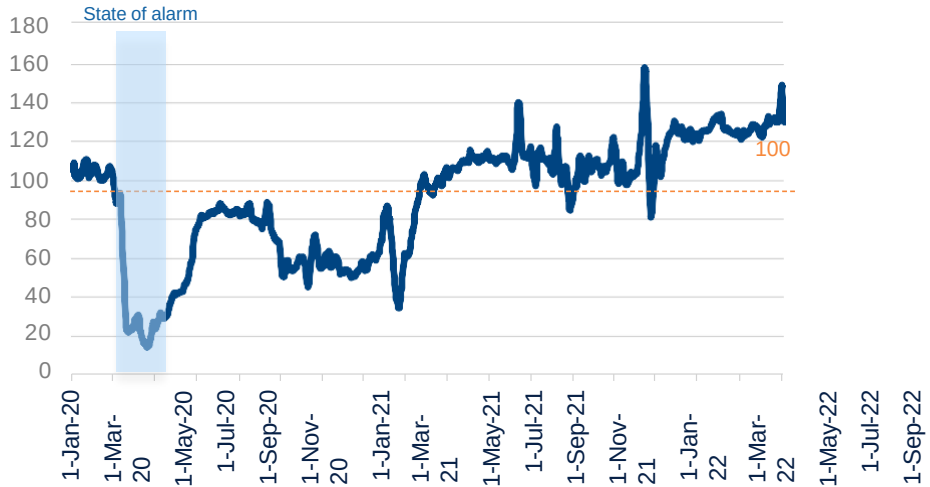
FACE-TO-FACE WEEKLY CARD EXPENDITURE OUTSIDE THE USUAL PROVINCE OF RESIDENCE*

(MILLON EUROS, MA 7 DAYS)



FACE-TO-FACE WEEKLY CARD EXPENDITURE OUTSIDE THE USUAL PROVINCE OF RESIDENCE*

(SAME PERIOD OF 2019=100, MA 7 DAYS)



*BBVA Card expenditure. It Includes the Spanish consumption abroad and cash withdrawals

Easter dates: **2018**: 24-mar/1-apr, **2019**: 13-apr/21-apr; **2020**: 4-apr/12-apr; **2021**: 27-mar/4-apr, **2022**: 9-abr/18-abr

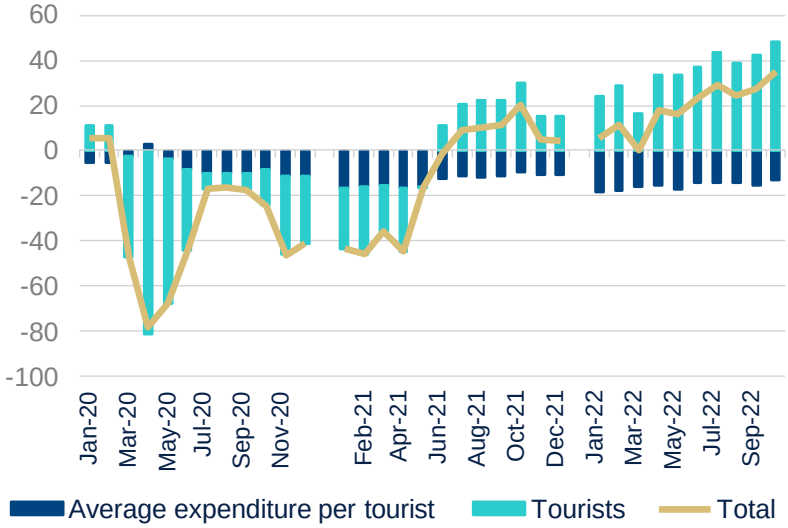
Note: Year-on-year comparisons from mid-March 2021 are affected by the declaration of the state of alarm, so the rest of the presentation will use the comparative ratios for 2019.

Source: BBVA Research from BBVA

The drop in consumption over 2020 was mainly due to the lower flow of tourists. However, starting from the second part of 2020 the lower average consumption affected the total dynamism. Although national tourism recovered already in May 2021, foreign consumption contributed positively only from the end of last year.

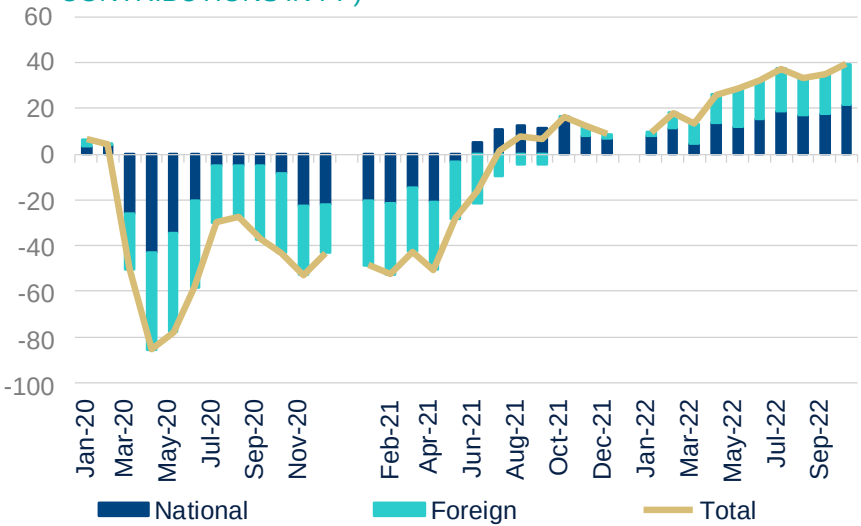
FACE-TO-FACE MONTHLY CARD EXPENDITURE OUTSIDE THE USUAL PROVINCE OF RESIDENCE*

(CHANGE WITH RESPECT TO THE SAME MONTH OF 2019 AND CONTRIBUTIONS IN PP)



FACE-TO-FACE MONTHLY CARD EXPENDITURE BY SPANIARDS OUTSIDE THE USUAL PROVINCE OF RESIDENCE AND BY FOREIGN TOURISTS *

(CHANGE WITH RESPECT TO THE SAME MONTH OF 2019 AND CONTRIBUTIONS IN PP)

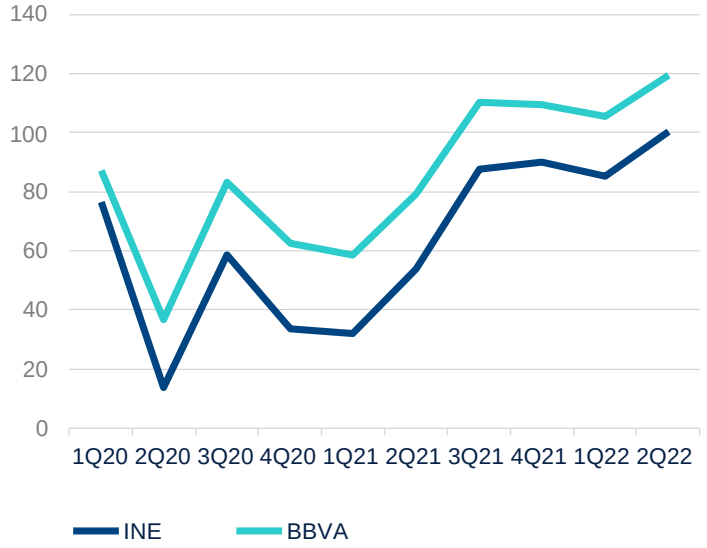


*BBVA Card expenditure. It Includes the Spanish consumption abroad and cash withdrawals
Number of tourists approximated by number of unique cards for which at least a movement is recorded per day
Source: BBVA Research from BBVA

Validation of results

FACE-TO-FACE CARD EXPENDITURE OUTSIDE THE USUAL PROVINCE OF RESIDENCE * AND TOTAL SPENDING IN TRAVELS AND TRIPS BY SPANIARDS ACCORDING TO INE RESIDENT TOURISM SURVEY

(SAME PERIOD OF 2019=100)



*BBVA Card expenditure. It Includes the Spanish consumption abroad and cash withdrawals
Source: BBVA Research from BBVA

BBVA EXPENDITURE FLOW CORRELATIONS VS RESIDENT TOURISM SURVEY (2018)

	Correlation (x100)
Total expenditure matrix	81.2
Expenditure matrix by residence	73.9
Expenditure matrix by destination	68.6

- The correlation analysis between card data and INE spending from the Resident Tourism Survey shows a high correlation at the aggregate level and in the largest Autonomous Communities.
- The lack of data in the Survey on origin-destination flows in the smaller Autonomous Communities does not allow a significant correlation value to be obtained (see annex).

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Tourism evolution in 2022

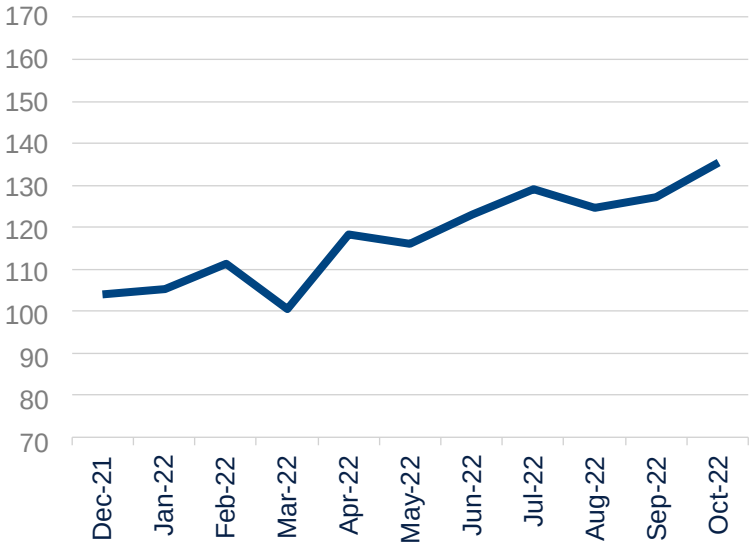
Creando Oportunidades

National tourism has been growing throughout 2022 and stayed above pre-crisis levels. Starting from the end of May, the growth remained stable around 30% more with respect to 2019. The effect of some national holidays and summer vacations pushed the spending in some months.

FACE-TO-FACE CARD EXPENDITURE OUTSIDE THE USUAL PROVINCE OF RESIDENCE*

(SAME PERIOD OF 2019=100)

MONTHLY



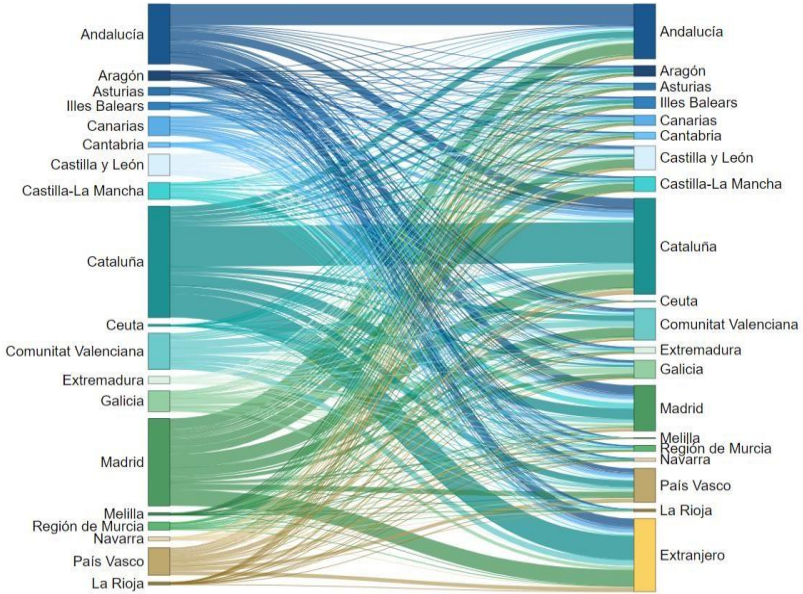
WEEKLY

*BBVA Card expenditure. It Includes the Spanish consumption abroad and cash withdrawals.
Source: BBVA Research from BBVA

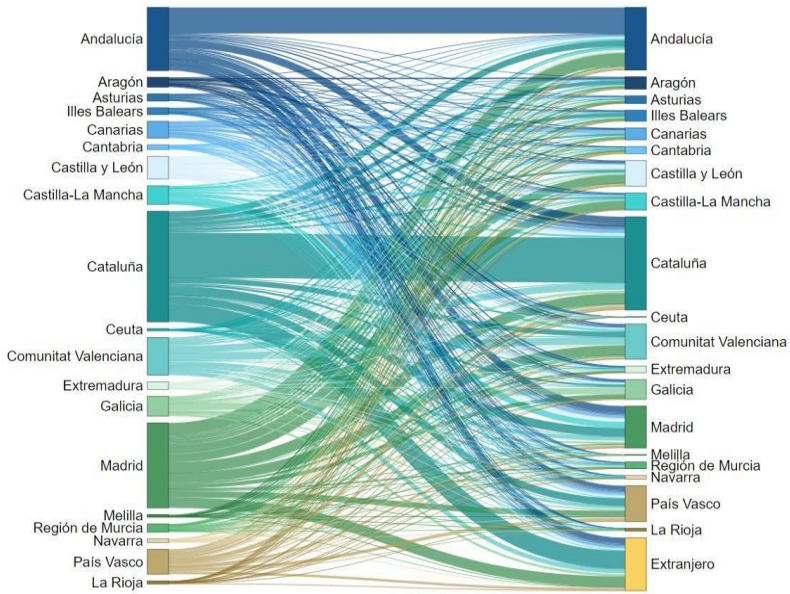
The share of abroad travels decreased in 2022, while intraregional one increased. Andalusia and Valencian Community gained importance as destination regions. Flows between Madrid and Catalonia are fewer due to the slow recover of business tourism.

FLOWS OF CARD EXPENDITURE OUTSIDE THE USUAL PROVINCE OF RESIDENCE FROM ORIGIN TO DESTINATION COMMUNITY*

JAN-OCT19



JAN-OCT22

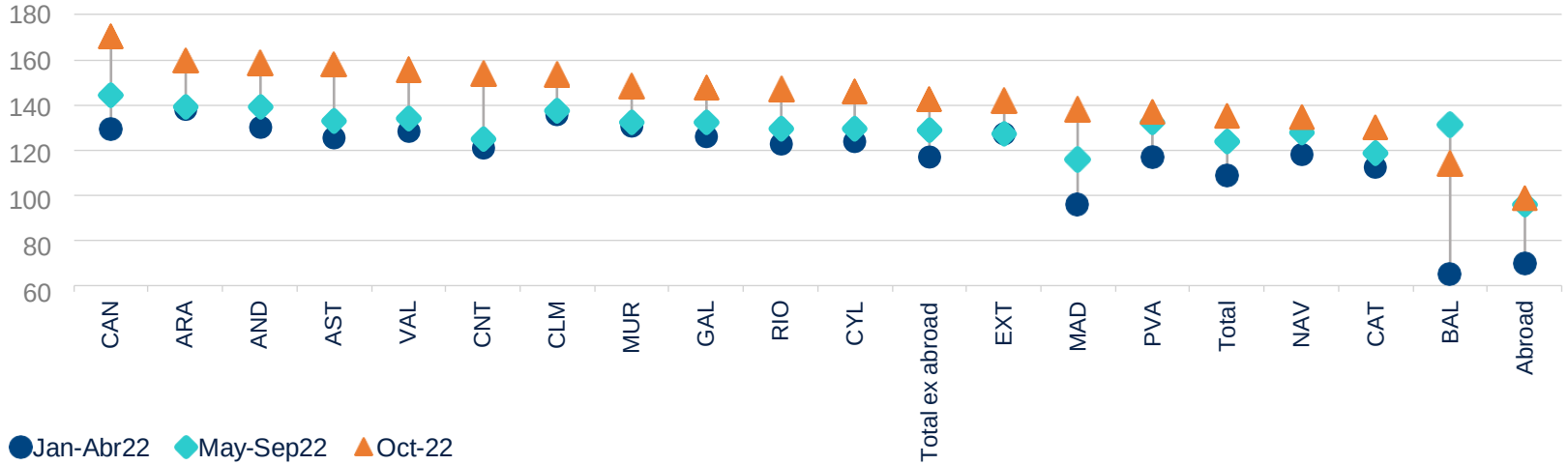


*BBVA Card expenditure. It Includes the Spanish consumption abroad and cash withdrawals.
Source: BBVA Research from BBVA

With the exception of Balearic Islands, the touristic expenditure showed a growing evolution throughout 2022 in all regions. In October, the Canary Islands, Aragon, Andalusia, Castilla-La Mancha and C. Valenciana were the most benefited destinations. On the other hand, abroad, Catalonia and Balearic Islands registered lower increases.

FACE-TO-FACE CARD EXPENDITURE OUTSIDE THE USUAL PROVINCE OF RESIDENCE BY REGION OF DESTINATION*

(SAME PERIOD OF 2019=100)

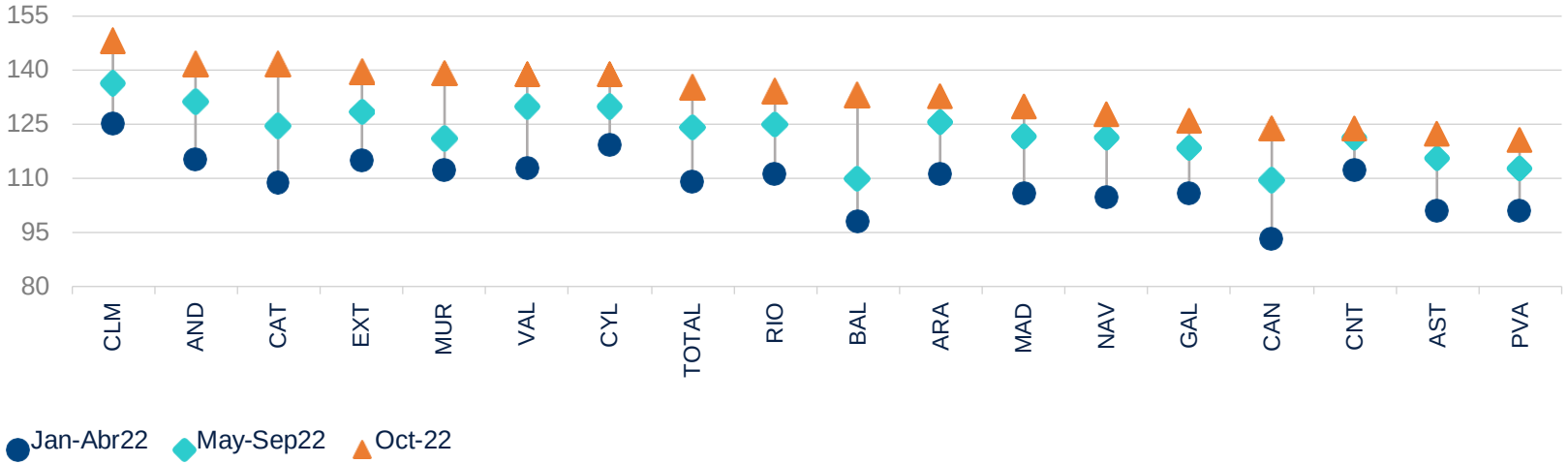


*BBVA Card expenditure. It Includes the Spanish consumption abroad and cash withdrawals.
Source: BBVA Research from BBVA

Similarly, all residence regions showed un upward trend. Inland and Mediterranean regions registered the higher growths in October, while in Cantabric communities there was a less dynamism.

FACE-TO-FACE CARD EXPENDITURE OUTSIDE THE USUAL PROVINCE OF RESIDENCE BY REGION OF RESIDENCE*

(SAME PERIOD OF 2019=100)

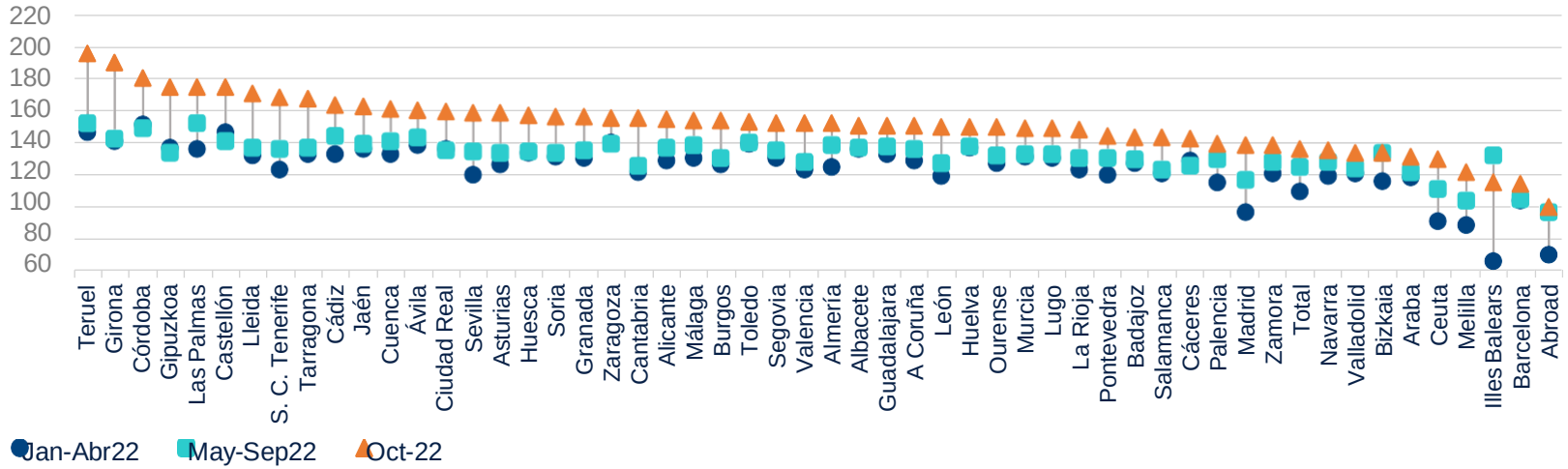


*BBVA Card expenditure. It Includes the Spanish consumption abroad and cash withdrawals.
Source: BBVA Research from BBVA

At a province level, Teruel, Girona, Cordoba, Gipuzkoa and Las Palmas led the ranking in October, while territories more focused on city tourism and abroad showed a lower growth.

FACE-TO-FACE CARD EXPENDITURE OUTSIDE THE USUAL PROVINCE OF RESIDENCE BY PROVINCE OF DESTINATION*

(SAME PERIOD OF 2019=100)



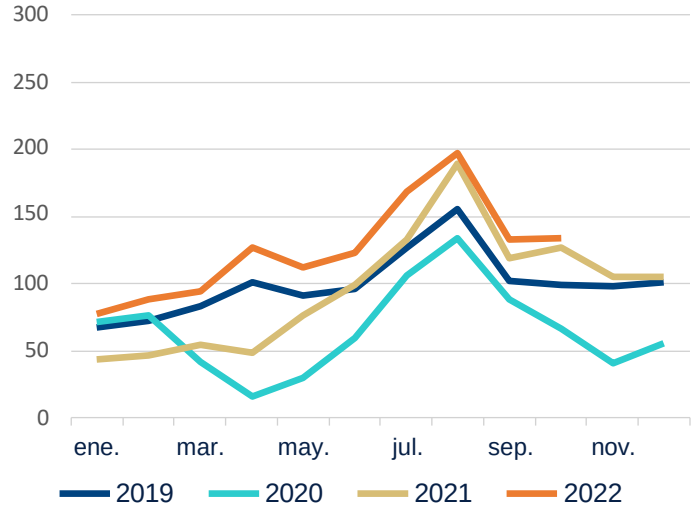
*BBVA Card expenditure. It Includes the Spanish consumption abroad and cash withdrawals.
Source: BBVA Research from BBVA

Tourism evolution in Navarra: total amounts

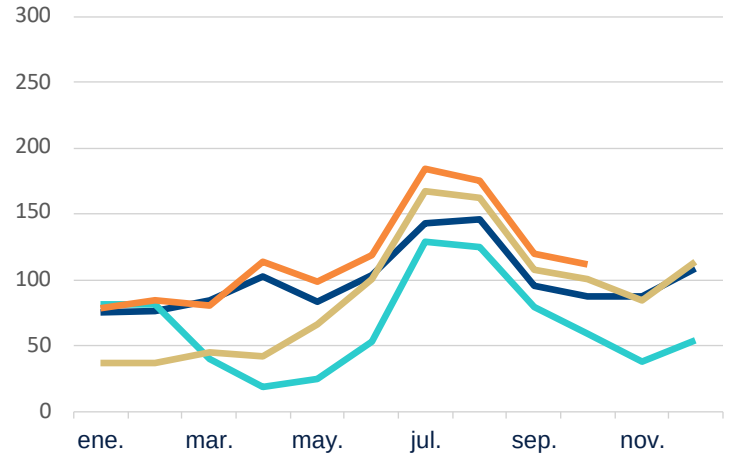
FACE-TO-FACE CARD EXPENDITURE OUTSIDE THE USUAL PROVINCE OF RESIDENCE*

(2019=100)

SPENDING IN NAVARRE BY THE REST OF SPAIN



SPENDING BY RESIDENTS IN NAVARRE IN THE REST OF SPAIN



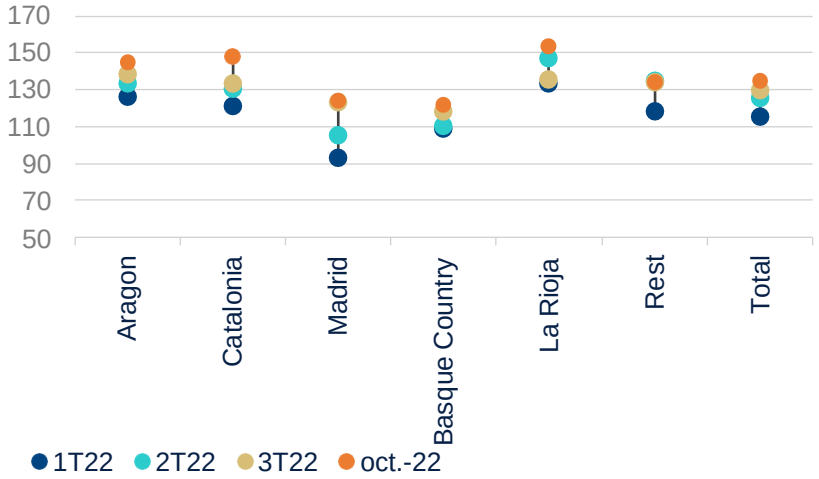
*BBVA Card expenditure. It Includes the Spanish consumption abroad and cash withdrawals.
Source: BBVA Research from BBVA

Tourism evolution in Navarra: main destination and origin regions

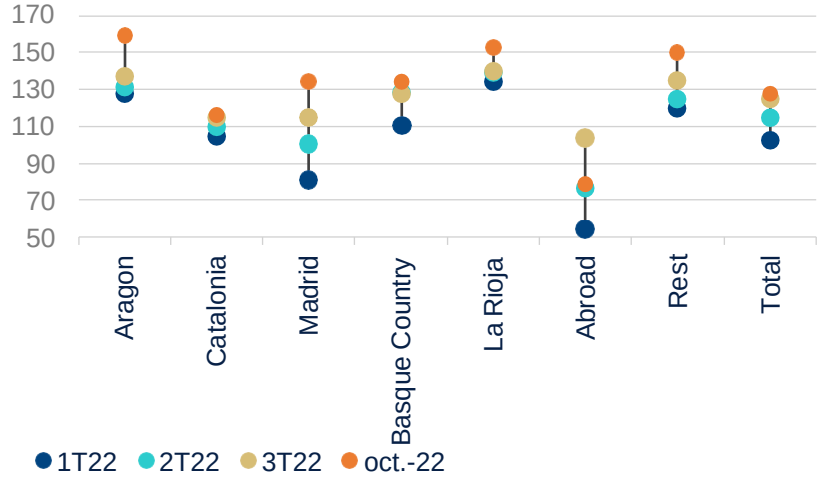
FACE-TO-FACE CARD EXPENDITURE OUTSIDE THE USUAL PROVINCE OF RESIDENCE*

(SAME PERIOD OF 2019=100)

SPENDING IN NAVARRE FROM THE REST OF SPAIN
BY MAIN ORIGIN REGIONS



SPENDING OF RESIDENTS IN NAVARRE TO THE REST OF SPAIN
BY MAIN DESTINATION REGIONS



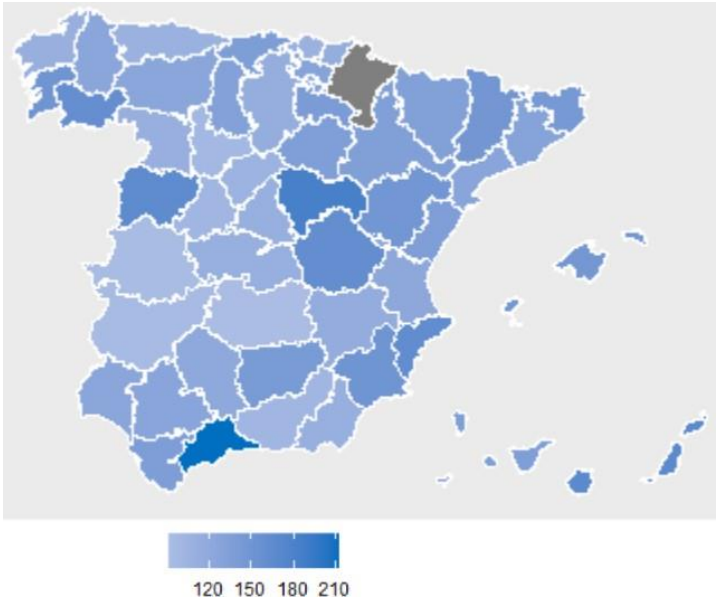
*BBVA Card expenditure. It Includes the Spanish consumption abroad and cash withdrawals.
Source: BBVA Research from BBVA

Tourism evolution in Navarra: focus on interprovincial flows

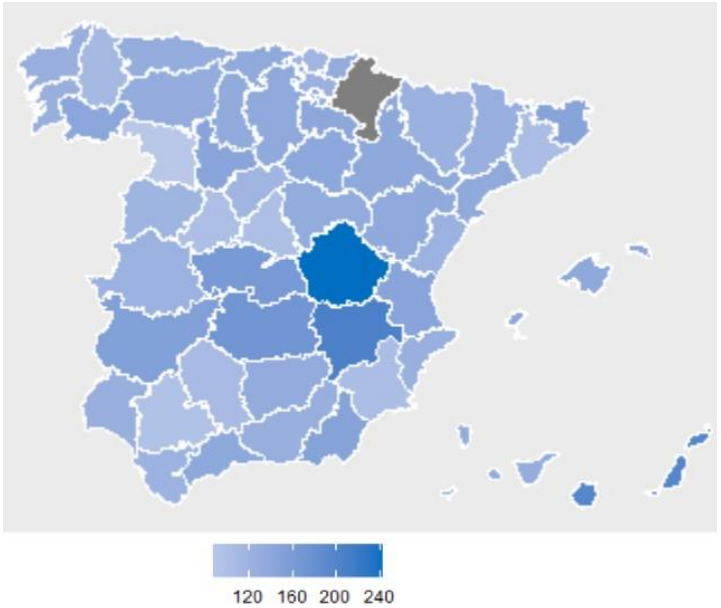
FACE-TO-FACE CARD EXPENDITURE OUTSIDE THE USUAL PROVINCE OF RESIDENCE IN JAN-OCT22*

(SAME PERIOD OF 2019=100)

SPENDING IN NAVARRE FROM THE REST OF SPAIN
BY ORIGIN PROVINCES



SPENDING OF RESIDENTS IN NAVARRE TO THE REST OF SPAIN
BY DESTINATION PROVINCES



*BBVA Card expenditure. It Includes the Spanish consumption abroad and cash withdrawals.
Source: BBVA Research from BBVA

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A gravity model for real-time national tourism data

Creando Oportunidades

A gravity model for national touristic flows

Objective

Analizing national touristic flows in Spain by province of origin and destination, starting from their main determinants, before and after the COVID-19.

Highlighting changes in patterns and preferences.

Available data

Face-to-face spending made with BBVA clients cards outside their province of usual residence, according to province of origin (residence) and destination (where the expense is made). In addition to spending levels, the number of travelers is available*

GRAVITY MODEL (Eugenio-Martin y Campos-Soria 2010; Rosselló y Santana-Gallego 2014)

Relationship between touristic flows and their determinants (economic income, distance, population, climate, prices, COVID restrictions, characteristics of province of destination)

*Aproximated with the number of unique cards with which at least a transaction was made in a day of the year.

A gravity model for national touristic flows

GRAVITY MODEL (Eugenio-Martin y Campos-Soria 2010; Rosselló y Santana-Gallego 2014)

EQUATION

$$\ln N_{ijt} = \beta_{ot} + \beta_1 \ln GDPpc_{it} + \beta_2 \ln Pob_{it} + \beta_3 \ln Dist_{ij} + \beta_4 Regi_{ij}$$

$$+ \beta_5 Cost_j + \beta_6 Isla_j + \beta_7 Mad_j + \beta_8 Bar_j + \beta_9 MadBar_{ij} + \beta_{10} \ln Price_{it}$$

$$+ \beta_{11} \ln Price_{jt} + \beta_{12} \ln Caph_{jt} + \beta_{13} \ln Temp_{jt} + \beta_{14} \ln COVID_{it} + \beta_{15} \ln COVID_{jt} + u_{ijt}$$

N_{ijt} = Travelers/Spending between i and j in t; **i** = province of origin; **j** = province of destination; **t** = year; **β_{ot}** = Fixed effect in year t; **$GDPpc_i$** = GDP per cápita in i and t; **Pob_{it}** = Population in i and t; **$Dist_{ij}$** = Distance between i and t; **Price** = Average ticket per transaction in i or j; **$Caph_j$** = Available hotel beds in j; **$Temp_j$** = Average anual temperature in j; **COVID** = average annual cases of COVID in i or j; **u_{ij}** error (iid)

Dummies: Regi(1 if origin and destination provinces belong to the same region); Cost (1 if destination province has coastline); Isla (1 if destination is an island); Mad (1 if destination is Madrid); Bar (1 if destination is Barcelona); MadBar (1 if origin is Madrid and destination Barcelona or the opposite).

Analysis period:
2018-2021

Estimation method:
OLS and Poisson Pseudo Maximum Likelihood (PPML)

*In the PPML model, the dependent variable is not expressed in ln.

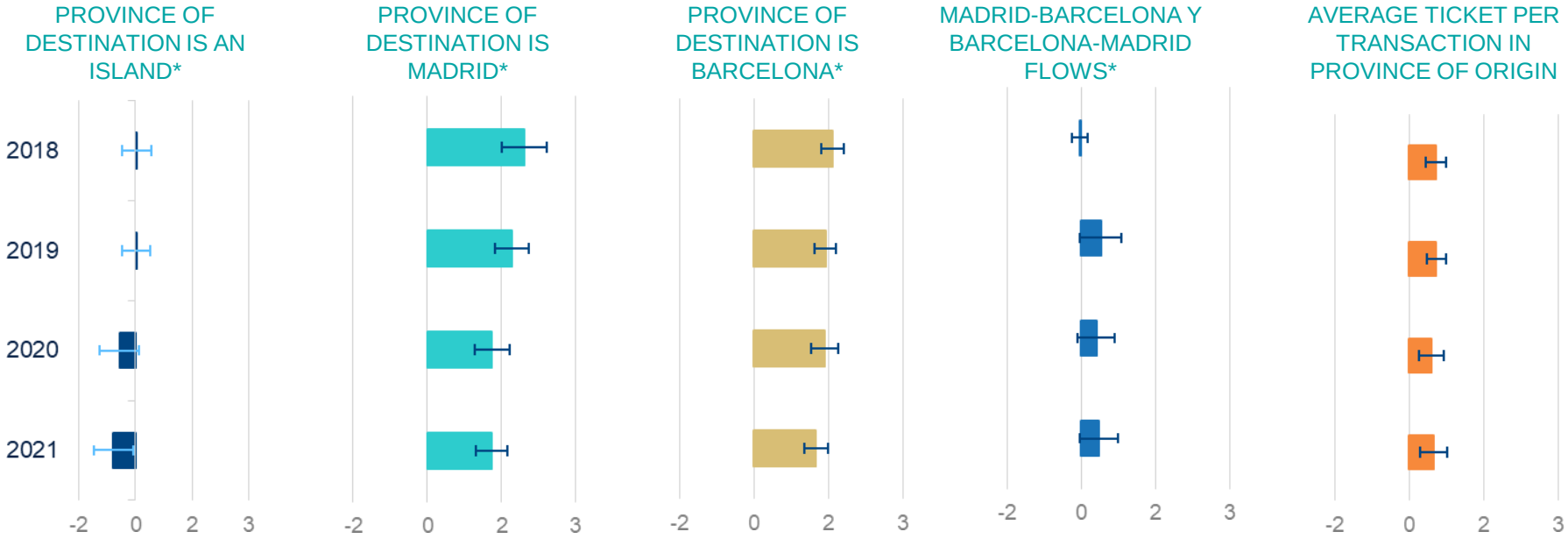
Results of the estimation

GRAVITY MODEL-DEPENDENT VARIABLE: TRAVELERS: COEFFICIENTS OF REGRESSION OF THE INDEPENDENT VARIABLES AND 95% CONFIDENCE INTERVAL (PPML Estimation)

* Dummy variables. Continuos variables in logarithms.
BBVA Research from BBVA.

Results of the estimation

GRAVITY MODEL- DEPENDENT VARIABLE: TRAVELERS: COEFFICIENTS OF REGRESSION OF THE INDEPENDENT VARIABLES AND THEIR 95% CONFIDENCE INTERVAL (PPML Estimation)



* Dummy variables. Continuos variables in logarithms.
BBVA Research from BBVA.

Results of the estimation

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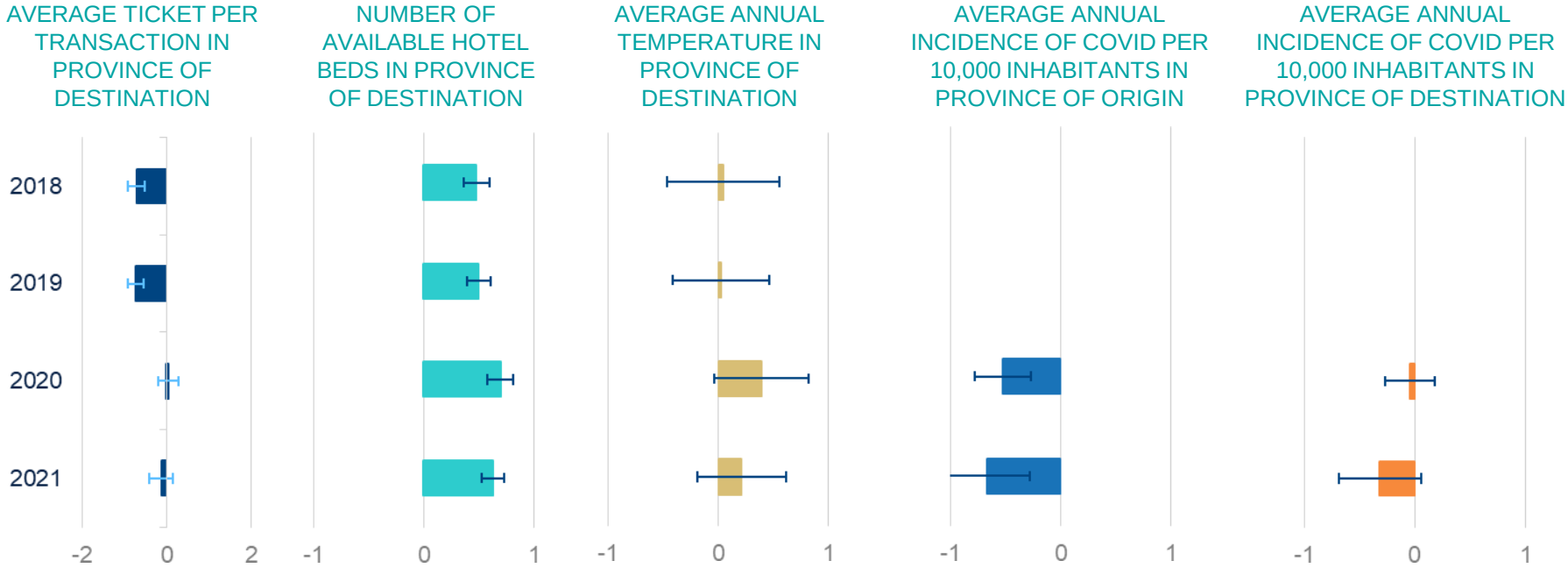
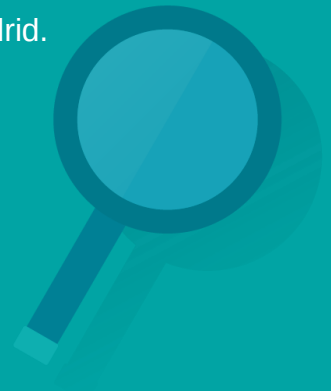


* Dummy variables. Continuos variables in logarithms.
BBVA Research from BBVA.

Results of the estimation

- GDP per capita of origin province has a positive impact on touristic flows, increasing in 2020 mainly.
- Population of origin province has a positive and stable effect on displacement.
- Distance between provinces negatively affects the choice of destination, increasing its effect with the pandemic.
- Belonging to the same Region has a positive effect on the choice of destination. It slightly reduces in 2020.
- Costline province has a positively impact on tourism but its impact disappears in 2020-2021 (trend towards rural tourism).
- Madrid and Barcelona reduce their attraction as tourist destinations with the pandemic, mainly Madrid.
- Number of available hotel beds has a positive effect on tourism, increasing with the pandemic.
- COVID has a negative effect in origin province and null in destination.



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Anexes

Validation of results

BBVA expenditure flow correlations vs Resident tourism survey (2018)

Residence Region	Correlation (x100)	Destination Region	Correlation (x100)
Cataluña	98.3	Cataluña	97.2
Andalucía	95.9	Andalucía	93.5
Baleares	95.9	Galicia	93.1
Galicia	91.2	Baleares	89.8
País Vasco	89.9	Canarias	84.6
Madrid	88.0	País Vasco	65.0
Castilla-La Mancha	85.7	Murcia	64.1
Aragón	81.6	Comunitat Valenciana	62.6
Cantabria	76.8	Navarra	59.1
Navarra	76.1	Aragón	58.0
Asturias	75.1	Extremadura	51.1
La Rioja	73.2	Asturias	48.9
Comunitat Valenciana	68.1	Castilla-La Mancha	40.5
Extremadura	45.9	Cantabria	38.6
Canarias	45.4	Castilla y León	18.9
Castilla y León	33.7	La Rioja	8.9
Murcia	28.0	Ceuta	
Ceuta		Melilla	
Melilla			
Average	**73.5**	**Average**	**60.8**

Anexo 1. Results of estimation

Model with travelers as dependent variable- OLS

Variable	2018	2019	2020	2021
PIBpci	0.55***	0.45***	0.74***	0.50***
Pobi	1.21***	1.21***	1.02***	1.20***
Distij	-1.19***	-1.19***	-1.04***	-1.21***
CCAAij	0.64***	0.66***	0.61***	0.73***
Costaj	0.33***	0.30***	0.15***	0.16***
Islaj	-0.00	-0.03	-0.19	-0.33***
Madj	1.83***	1.69***	1.34***	1.23***
Barj	1.87***	1.77***	1.99***	1.61***
MadBarij	0.51***	0.31	0.31	0.28
Precioi	0.30***	0.29***	0.16*	0.18**
Precioj	-0.33***	-0.33***	0.07	-0.06
Capj	0.58***	0.59***	0.77***	0.74***
lntemp	0.33**	0.34**	0.68***	0.11
Inc_i			-0.39***	-0.33***
Inc_j			-0.04	-0.27***
_cons	-4.03***	-3.01***	-5.61***	-0.06
r2	0.81	0.82	0.83	0.83
N	2450	2450	2450	2450
aic	5212.54	5130.30	5032.91	4897.49
bic	5293.79	5211.55	5125.77	4990.35

Legend: * p<0.05; ** p<0.01; *** p<0.001

Anexo 2. Results of estimation

Model with travelers as dependent variable- PPML

Variable	2018	2019	2020	2021
PIBpci	0.59***	0.48***	1.26***	1.04***
Pobi	1.16***	1.13***	1.12***	1.12***
Distij	-0.90***	-0.96***	-1.11***	-1.03***
CCAAij	0.76***	0.71***	0.61***	0.70***
Costaj	0.41***	0.38***	0.13***	0.12
Islaj	0.04	0.02	-0.42*	-0.58**
Madj	1.96***	1.71***	1.31***	1.30***
Barj	1.59***	1.44***	1.42***	1.25***
MadBarij	-0.04	0.40	0.30	0.35
Precioi	0.54***	0.55***	0.45***	0.50***
Precioj	-0.71***	-0.74***	0.04***	-0.13
Capj	0.48***	0.50***	0.70***	0.63***
lntemp	0.04	0.02	0.39	0.21
Inc_i		-8.39	-0.52***	-0.66***
Inc_j			-0.04	-0.32
_cons	-7.88***	-8.39***	-15.21***	-8.16**
r2	0.88	0.90	0.91	0.91
N	2450	2450	2450	2450
aic	2.4e+05	32448.79	1.8e+05	2.4e+05
bic	2.4e+05	32530.05	1.8e+05	2.4e+05

Legend: * p<0.05; ** p<0.01; *** p<0.001

Anexo 3. Results of estimation

Model with expenditure as dependent variable- OLS

Variable	2018	2019	2020	2021
PIBpci	0.74***	0.68***	0.95***	0.69***
Pobi	1.18***	1.18***	1.16***	1.17***
Distij	-1.06***	-1.07***	-1.29***	-1.12***
CCAAij	0.65***	0.65***	0.62***	0.72***
Costaj	0.46***	0.46***	0.40***	0.42***
Islaj	0.15	0.15	0.09	-0.04
Madj	1.94***	1.78***	1.35***	1.25***
Barj	1.86***	1.79***	2.09***	1.61***
MadBarij	0.48***	0.12	0.16	0.12
Capj	0.56***	0.57***	0.73***	0.72***
lntemp	0.41***	0.34***	0.44***	0.00
Inc_i			-0.36***	-0.26**
Inc_j			-0.09	-0.26**
_cons	-2.39**	-1.68*	-1.91*	1.98
r2	0.81	0.81	0.82	0.82
N	2450	2450	2450	2450
aic	5219.49	5163.50	5213.19	4897.52
bic	5281.13	5233.15	5294.45	5069.77

Legend: * p<0.05; ** p<0.01; *** p<0.001

Anexo 1. Results of estimation

Model with expenditure as dependent variable- PPML

Variable	2018	2019	2020	2021
PIBpci	0.67***	0.59***	1.02***	0.88***
Pobi	1.15***	1.12***	1.13***	1.12***
Distij	-0.72***	-0.77***	-0.92***	-0.85***
CCAAij	0.70***	0.65***	0.55***	0.67***
Costaj	0.69***	0.67***	0.72***	0.63***
Islaj	0.40	0.35	0.40	0.24
Madj	2.21***	1.98***	1.45***	1.55***
Barj	1.66***	1.53***	1.40***	1.24***
MadBarij	-0.22	0.18	0.14	0.15
Capj	0.36***	0.39***	0.54***	0.46***
lntemp	-0.12	-0.22	0.07	0.24
Inc_i			-0.47***	-0.53*
Inc_j			0.26	0.31
_cons	-6.88***	-5.57***	-9.97***	-8.21***
r2	0.86	0.87	0.85	0.87
N	2450	2450	2450	2450
aic	2.4e+06	2.0e+06	1.6e+06	1.9e+06
bic	2.4e+06	2.0e+06	1.6e+06	1.9e+06

Legend: * p<0.05; ** p<0.01; *** p<0.001

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Giancarlo Carta, BBVA Research
Pamplona, 24th November 2022

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