BBVA Research

Interregional Spending Tracker – A Proxy to Track Domestic Tourism

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Creating Opportunities

BBVA Research

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Project objective and methodology

- We aim to observe interregional spending dynamics and have a proxy for domestic tourism expenditures.
- We track Garanti BBVA clients' card expenditures with increased granularity. Including provincial location of the expenditures, and spending flows depending on the clients' usual place of residence.
- Domestic tourism expenditures reflect consumer demand dynamics and can be incorporated into economic models. Regional data can be used to infer region specific trends and changing popularity of hotspots.
- Interregional spending dynamics can also be used strategically for bank campaigns and targeting specialized products for specific regions.

	TUIK	GB
Method:	Computer assisted face-to-face interviews	Big data analytics, physical card transactions
Frequency:	Country-wide data is available quarterly, regional is available annually. Almost 4 month lag between observed periods and data release.	Daily
Dimensionality:	Limited, samples Turkey as a whole	Highly granular, covers GB customers
Uniqueness:	Number of overnights and trips, type of accommodation and expenditure	Province levels, increased frequency, micro level data

Methodology

Condition:
TOTAL_COUNT > 12

MAIN_LOCATION_IND =
0.5*AMOUNT_PERCT +
0.5*COUNT_PERCT

Step 1 (Identifying the usual residence of customers, *yearly*):

PURCHASER_ID	YEAR	MERC_LOCATION	TRAN_AMOUNT	TRAN_COUNT	TOTAL_AMOUNT	TOTAL_COUNT	AMOUNT_PERCT	COUNT_PERCT	MAIN_LOCATION_IND
XX541Y027XX	2023	ISTANBUL	500	15	2150	124	23%	12%	18%
XX541Y027XX	2023	ANKARA	900	60	2150	124	42%	48%	**45%**
XX541Y027XX	2023	IZMIR	200	12	2150	124	9%	10%	9%
XX541Y027XX	2023	ADIYAMAN	250	23	2150	124	12%	19%	15%
XX541Y027XX	2023	GERMANY	300	14	2150	124	14%	11%	13%

For abroad transactions, we include the country instead of province.

The corresponding location to maximum MAIN_LOCATION_IND is accepted as the usual residence of an ID

Step 2 (Labelling which transactions are tourism related and which are not):

DATE	MERCHANT_LOCATION	PURCHASER_ID	PURCHASER_USUAL_RESIDENCE	TRAN_AMOUNT_TL	TOURISM_TRANSACTION
21.05.2023	ANKARA	XX541Y027XX	ANKARA	300	0
04.03.2023	ISTANBUL	XX541Y027XX	ANKARA	400	1
05.07.2023	IZMIR	XX541Y027XX	ANKARA	250	1

Condition for **TOURISM_TRANSACTION = 1**:
MERCHANT_LOCATION **!=** PURCHASER_USUAL_RESIDENCE

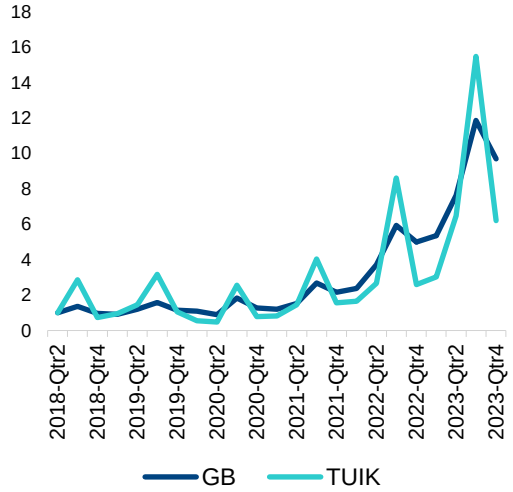
Step 3 (Aggregation):

DATE	MERCHANT_LOCATION	PURCHASER_USUAL_RESIDENCE	TRAN_AMOUNT_TL	TOURISM_TRANSACTION
21.05.2023	ANKARA	ANKARA	117,585,201	0
04.03.2023	ISTANBUL	IZMIR	9,860,931	1
05.07.2023	IZMIR	GAZIANTEP	235,381	1

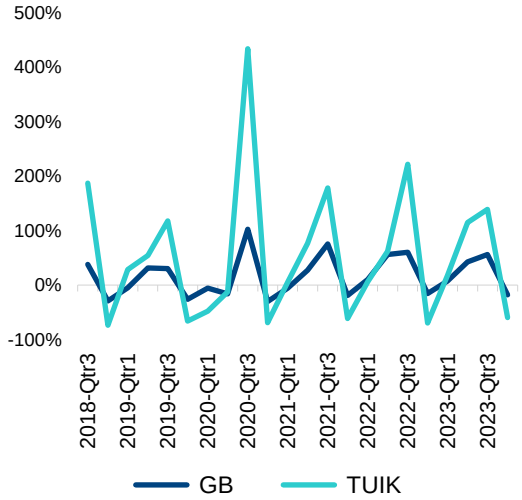
Data in this slide were artificially generated for methodology demonstration.

We compare Garanti BBVA Card Spending outside the usual residence data with the official Domestic Tourism Expenditures

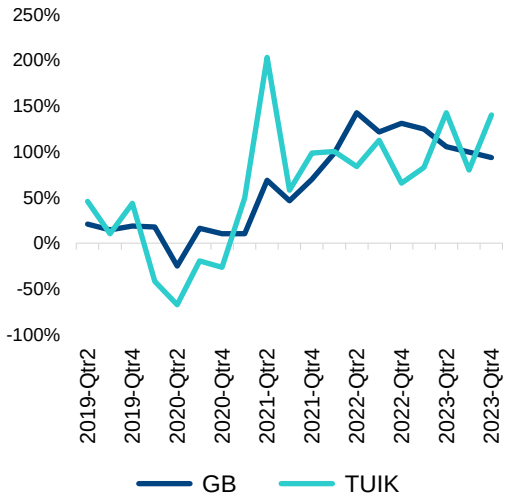
FIRST PERIOD REBASED INDEXES (2018Q2 = 1)



QOQ CHANGES



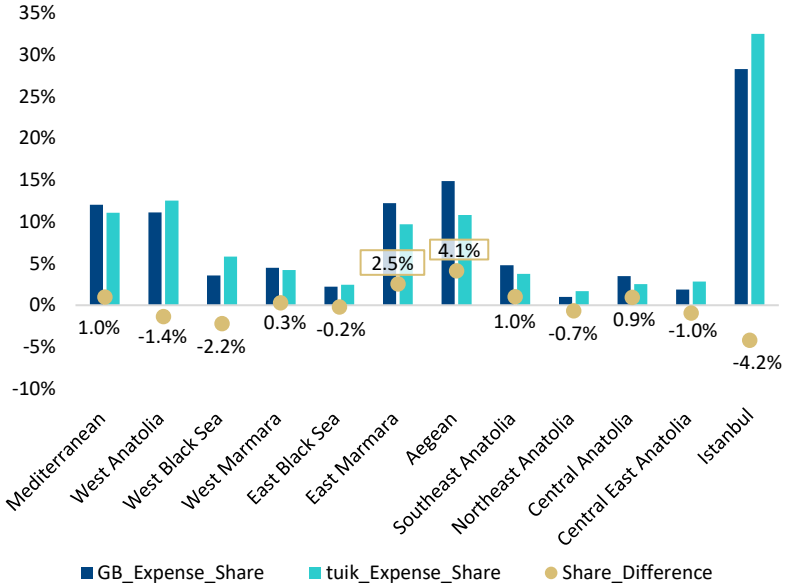
YOY CHANGES



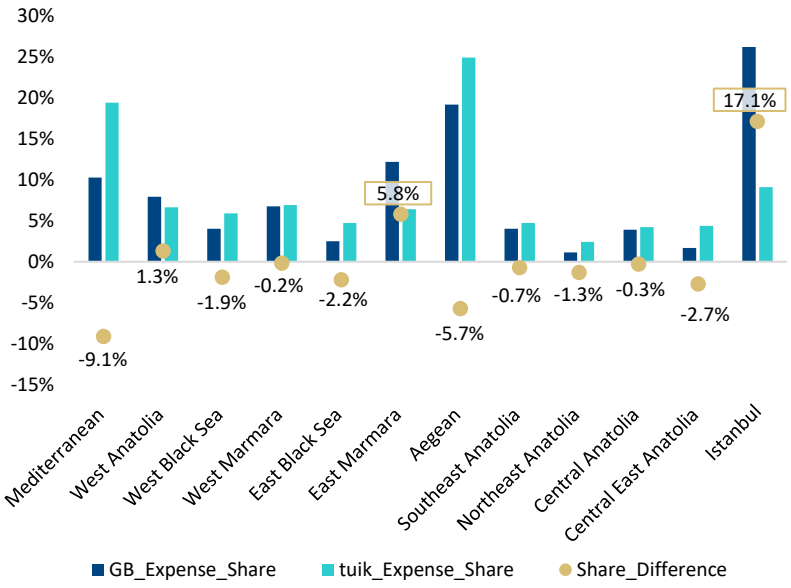
Official statistics are more volatile, possibly due to a combination of more robust tourism definition and methodology differences.

Our tourism expenses by residence results are highly compatible with TUIK, meanwhile tourism expenses to destinations diverge possibly due to difference in tourism classifications

2022, TOURISM EXPENSES BY RESIDENCE, SHARE IN TOTAL

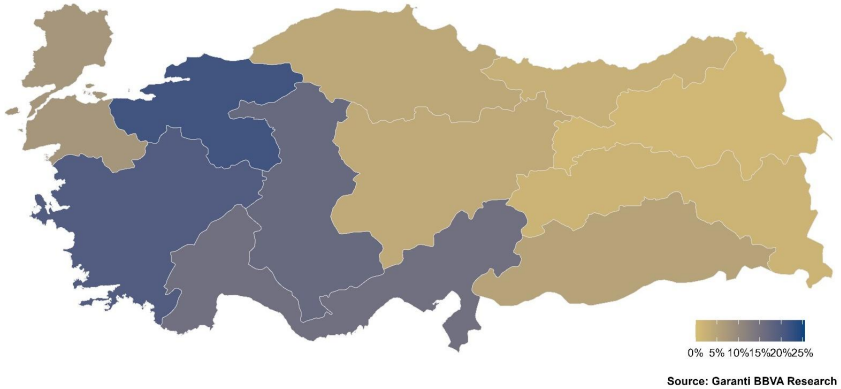


2022, TOURISM EXPENSES TO DESTINATIONS, SHARE IN TOTAL



Distribution of origination locations according to expenses (TL) made in Istanbul (2022, NUTS1) shows overweighting of East Marmara in Garanti BBVA data

GARANTI BBVA:



Source: Garanti BBVA Research

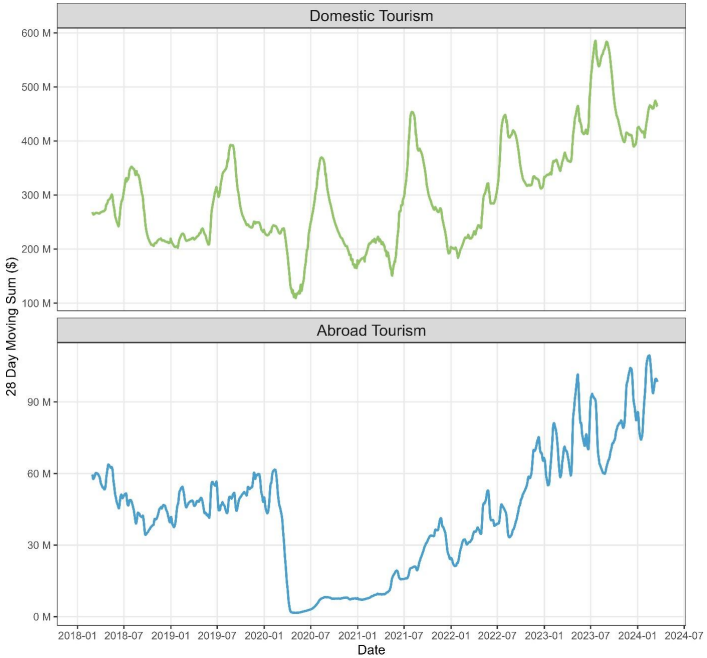
TUIK:

Source: Garanti BBVA Research

The major overweighting of East Marmara might be a characteristic of our method, as expenditures due to working in another province are not eliminated even though they are not explicitly tourism related.

Both domestic and abroad tourism expenditures outgrew pre-pandemic levels, mostly due to higher card usage and changes in consumption behavior

28 DAY MOVING SUM SERIES IN NOMINAL USD



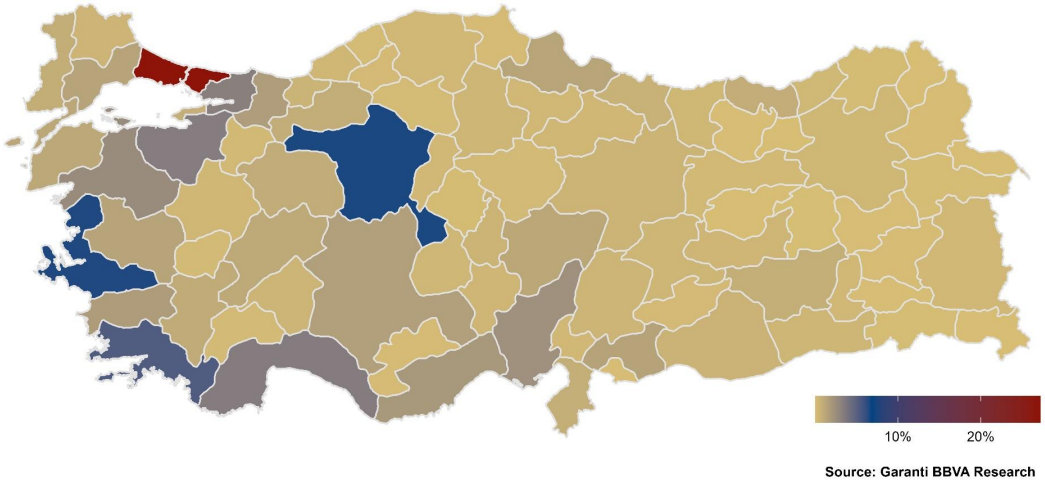
YOY - 28 DAY MOVING SUM SERIES IN NOM. USD

Three largest provinces by contributions to GDP (Istanbul, Ankara, Izmir), East Marmara & Southwestern coastal provinces attained the largest shares from domestic tourism expenditures

GEOGRAPHICAL POSITIONING

Source: Wikimedia Commons

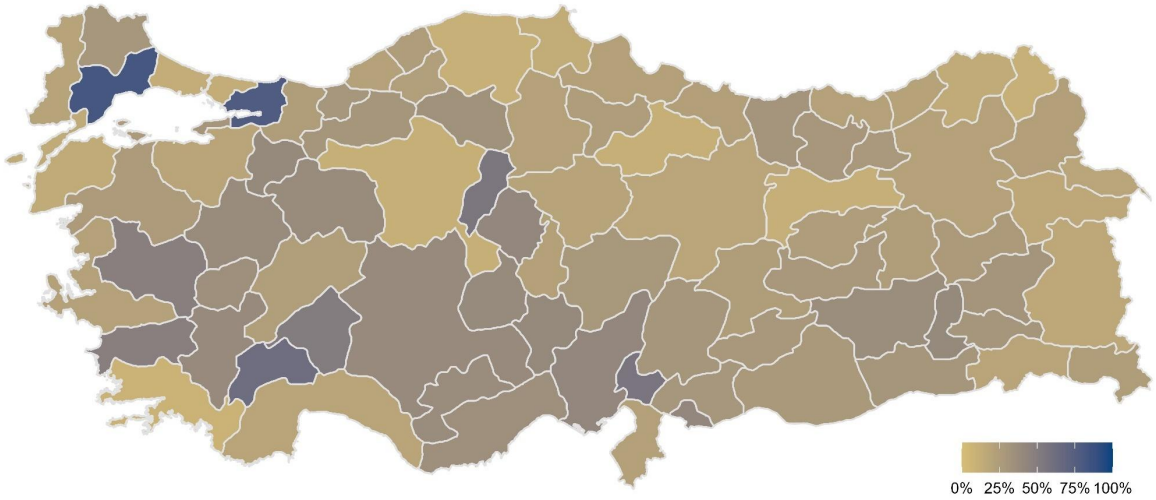
2023 - CONCENTRATION OF DOMESTIC TOURISM



Source: Garanti BBVA Research

A significant portion of the domestic tourism expenditures received by the provinces, originated from their neighbors*

2023 - PROVINCE BASED, NEIGHBORING PROVINCES CONTRIBUTION TO ACQUIRED TOTAL DOMESTIC TOURISM



Source: Garanti BBVA Research

$$\text{Neighbor Contribution}_{P_i} : \frac{\text{Tourism Inflow From Neighbors}_{P_i}}{\text{Total Tourism Inflow}_{P_i}}$$

P_i: Province_i

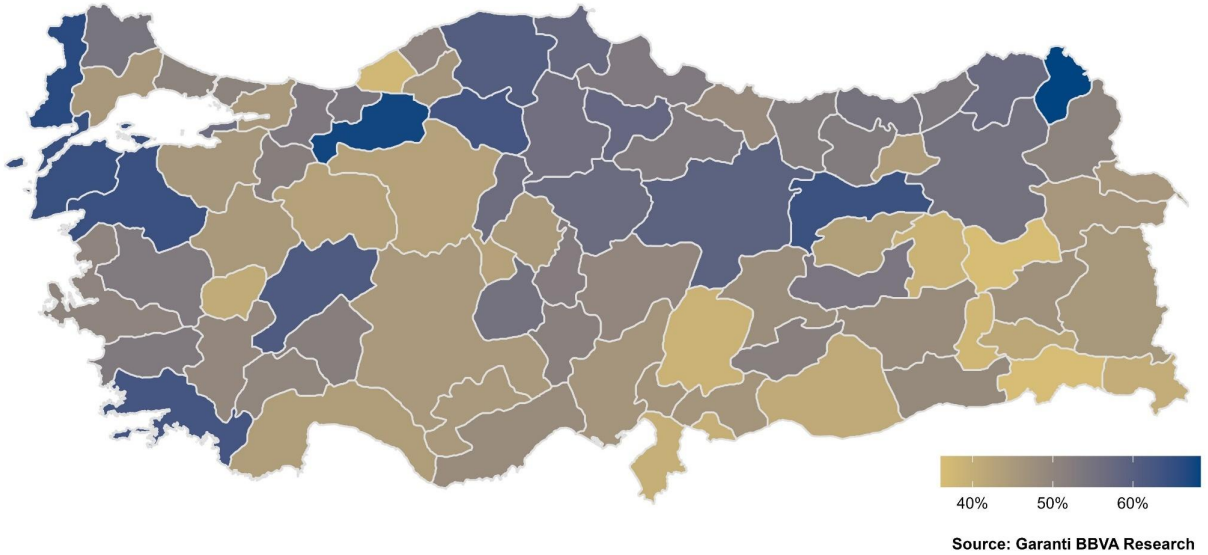
For it to be considered neighbors, there must be a shared land border.

Province based domestic tourism inflow over total domestic tourism activity illustrates potential hot spots

$$\text{Tourism Leverage}_{P_i}: \frac{\text{Tourism Inflow}_{P_i}}{\text{Tourism Inflow}_{P_i} + \text{Tourism Outflow}_{P_i}}$$

P_i: Province_i

2023 - TOURISM LEVERAGE PER PROVINCE



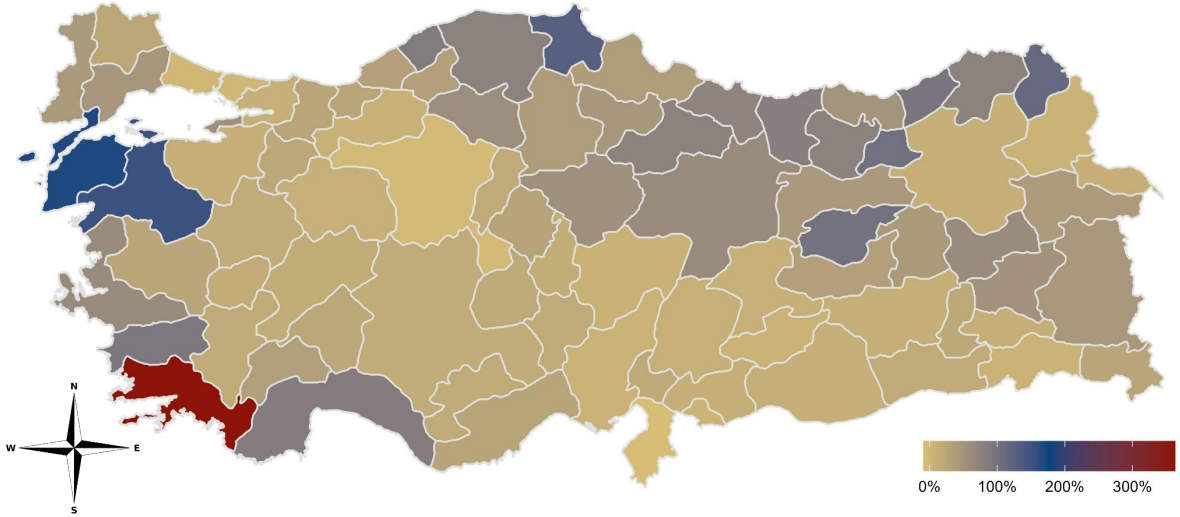
Source: Garanti BBVA Research

Seasonal effects on regional domestic tourism demand can also be identified through our data

$$\text{Summer Effect}_{P_i}: \frac{\text{Tourism Inflow}_{P_i,\,(Q2\,\&\,Q3)}}{\text{Tourism Inflow}_{P_i,\,(Q1\,\&\,Q4)}} - 1$$

P_i: Province_i

2023 - SUMMER SEASON EFFECT PER PROVINCE

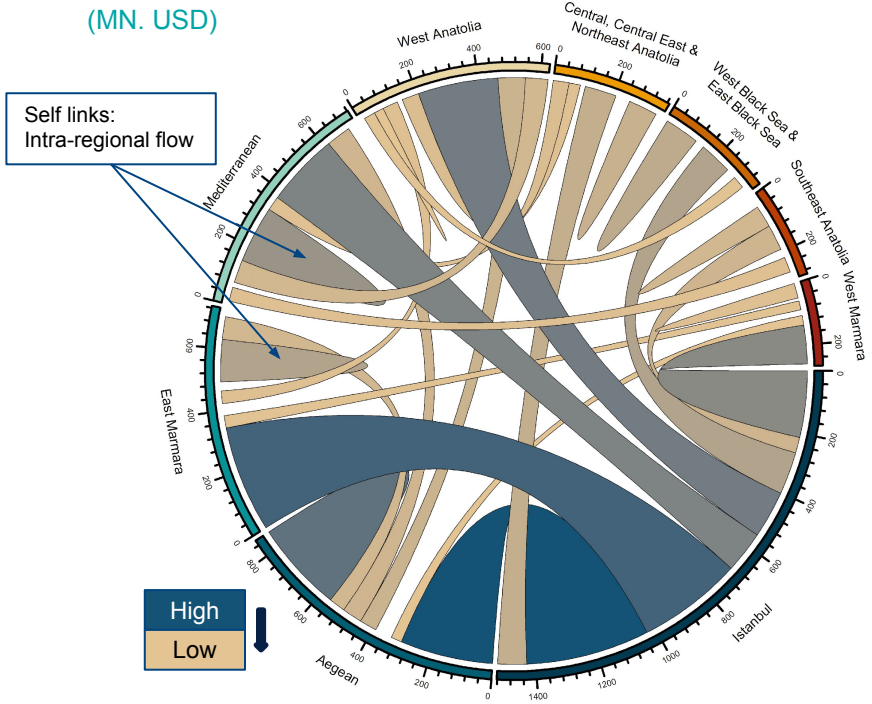


Source: Garanti BBVA Research

Southern and Western coastal provinces benefitted the most from the summer season. The diagonal strip in the Northeastern side is likely an outcome of holiday effects, particularly summer break and religious (moving) holidays when people are visiting relatives.

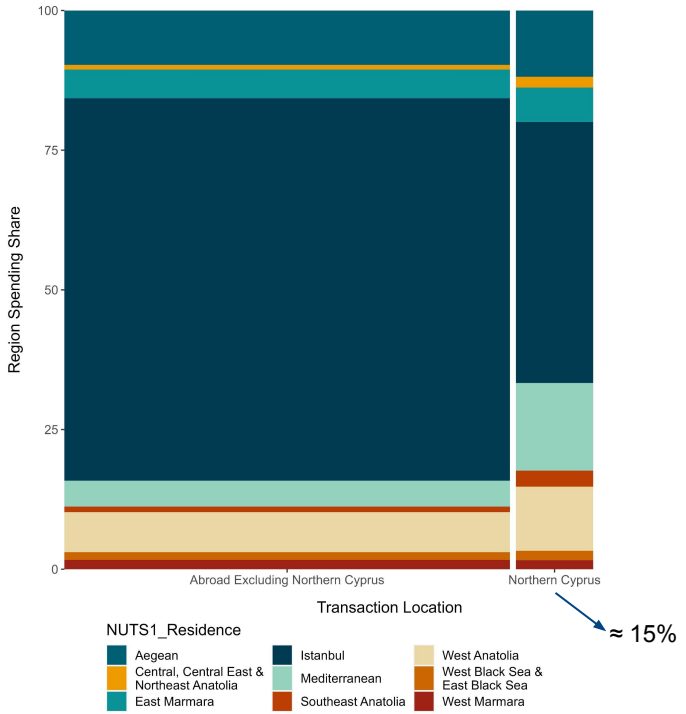
Istanbul stands apart in tourism flows due to higher population and customer base dynamics

2023 - BILATERAL FLOWS
(MN. USD)



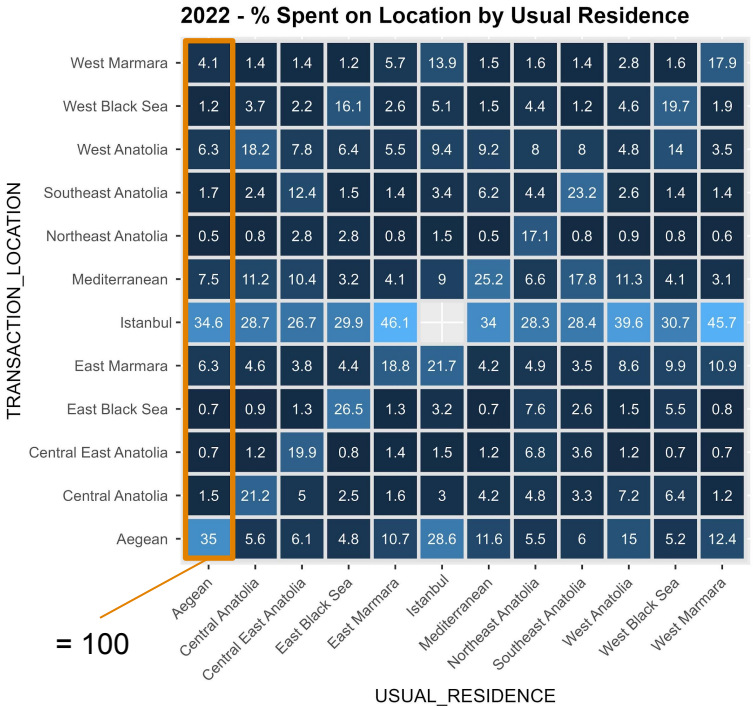
Link origination widths & colors represent outflow intensity.

2023 - SPENDING SHARES ABROAD

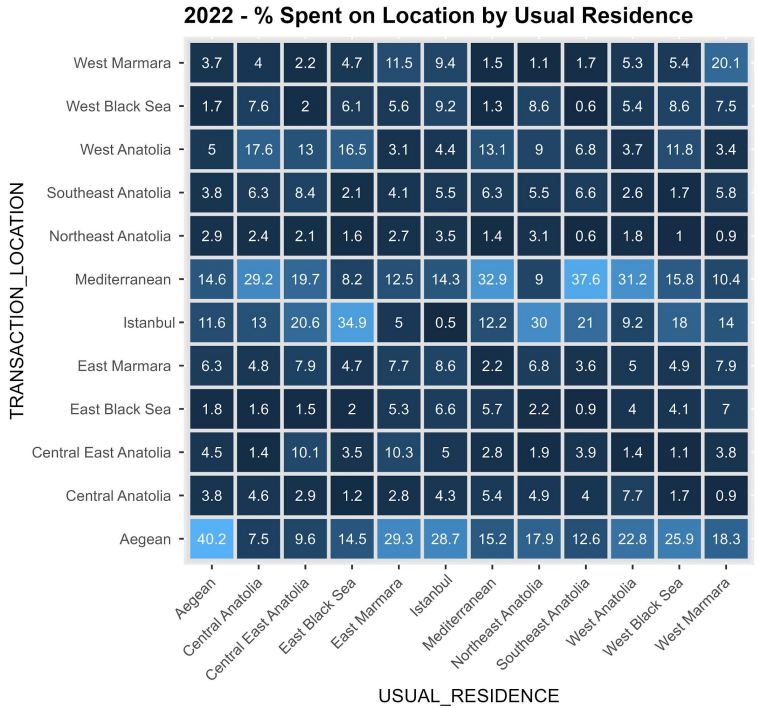


Compared to TUIK, there is a consistent disproportionate bias towards spending in Istanbul and underestimation of major regions

GB



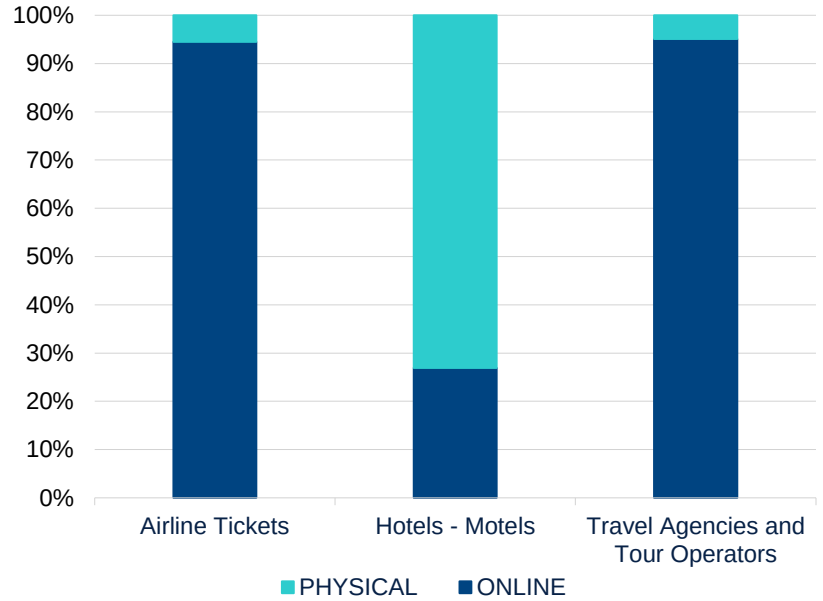
TUIK



Incorporating online transactions related to tourism may be beneficial in reducing regional biases

- **Excluding online transactions** might be causing a **downward bias** regarding **tourism expenditures** to coastal cities of Aegean and Mediterranean regions.
- As **online transactions** provide **less robust location information** for merchants, we aren't taking them into account. A retroactive approach to **distribute relevant expenditures after** determining a customers main location may be beneficial.

GB 2023 - ONLINE VS. PHYSICAL SPENDING SHARES OF MAJOR TOURISM CATEGORIES



Alternative Use Cases and Potential Areas of Interest

Potential Area 1:

- Observing migration trends over time. People are moving from Istanbul to settle elsewhere, can we infer about potential destinations?
- Real-time tracking of migration flows after natural disasters.

Potential Area 2:

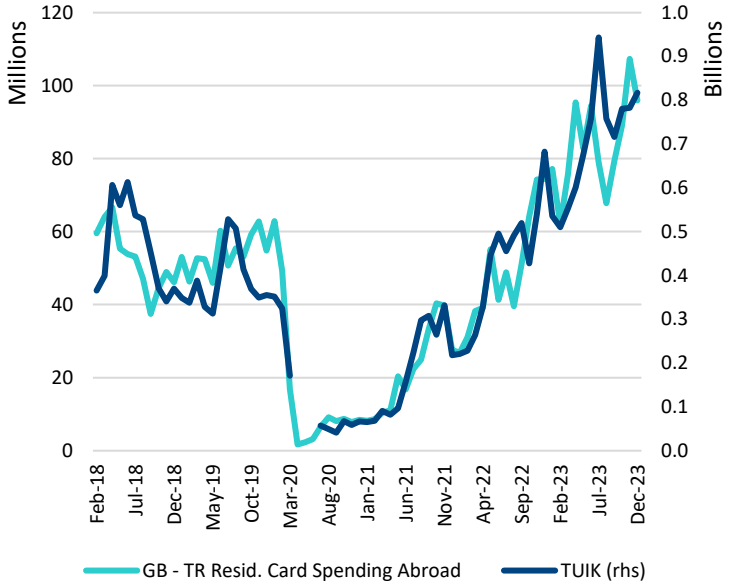
- How does domestic tourism and tourism by foreigners differentiate?
- What preferences (consumption category, destination) do residents have when traveling abroad?
- What kind of effects do income or wealth have on tourism duration and region preferences?
- National holidays and its effects on tourism.

Potential Area 3:

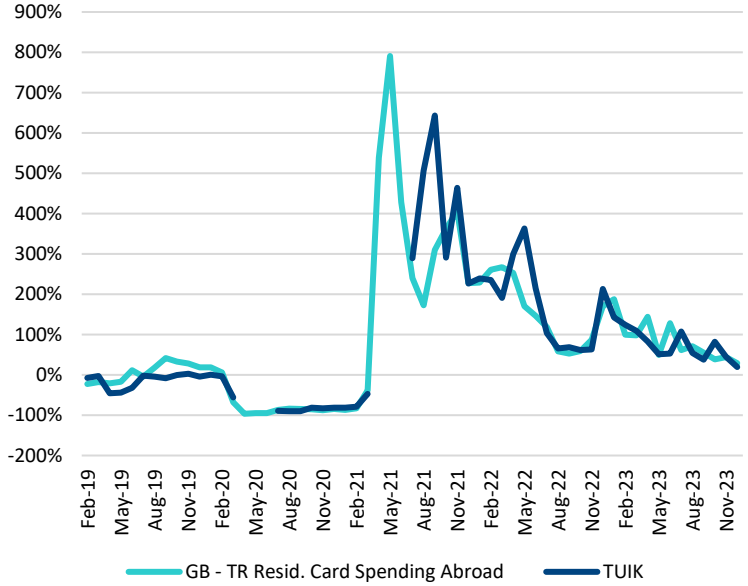
- Gravity model, estimating different variables' impact on domestic tourism.

Residents tourism expenditures abroad is tracked relatively well, it can further be used to track destination and consumption preferences

NOMINAL TOURISM EXPENDITURES



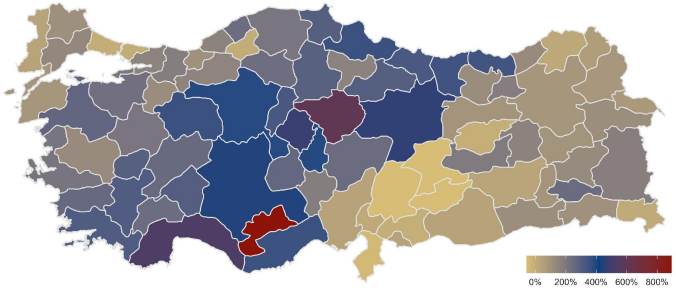
YOY TOURISM EXPENDITURES



We are able to observe the migration flows caused by the 2023 earthquakes

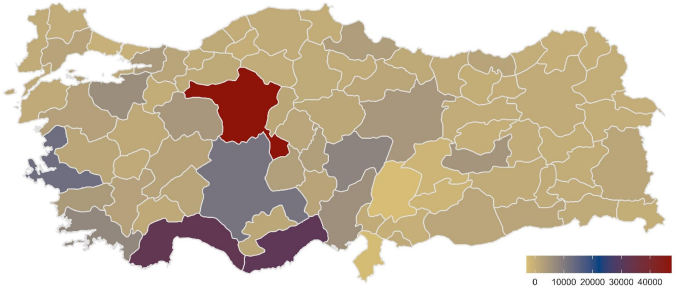
Change in transaction counts outside of usual residences in the third week of the earthquake, compared to the average of last 2 weeks before the earthquake. Across provinces, for customers whose usual residence* got severely affected (using usual residence results of 2022)

Province based % change in transaction counts from provinces hit by the 2023 earthquake outside of their usual residence, Week:3

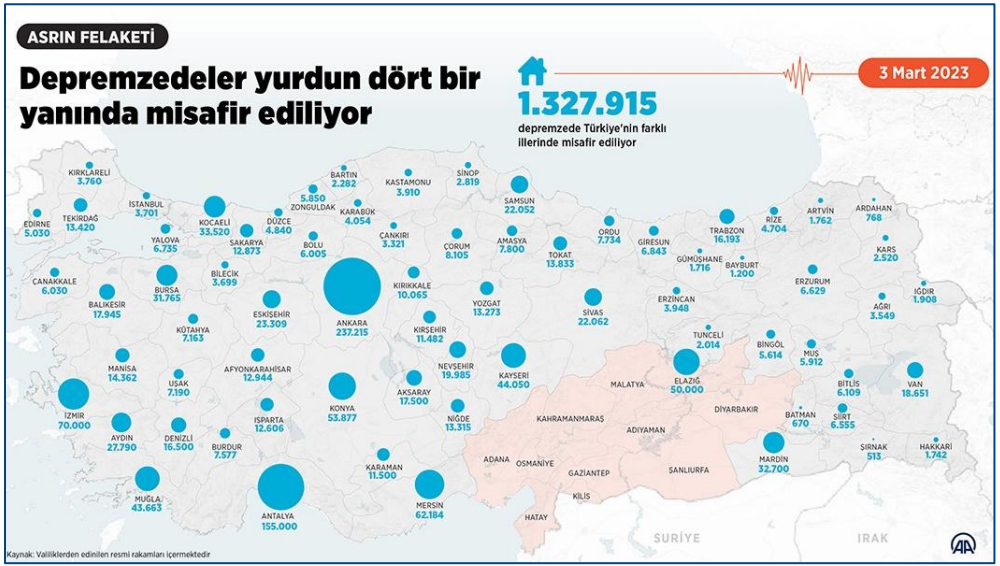


Source: Garanti BBVA Research

Province based nominal change in transaction counts from provinces hit by the 2023 earthquake outside of their usual residence, Week:3



Source: Garanti BBVA Research



Source: Anadolu Agency, data compiled from governorships.
https://www.aa.com.tr/tr/asrin-felaketi/depremzedeler-yurdun-dort-bir-yaninda-misafir-ediliyor/2836477

* 6 provinces with the highest number of heavily damaged/destroyed buildings: Hatay, Kahramanmaraş, Osmaniye, Malatya, Adıyaman, Gaziantep
Source: https://www.csb.gov.tr/deprem-bolgelerinde-830-bin-783-binadaki-3-milyon-273-bin-605-bagimsiz-birimde-hasar-tespit-calismasi-yapildi-bakanlik-faaliyetleri-38439

What can be improved?

Usual residence method:	Estimation of domestic tourism:
Spread of transactions Example: A given customer has 250 days with transactions, 200 were in Istanbul. Thus, more likely to have its residence Istanbul **Count of cash deposits/withdrawals from ATM's** Eastern regions of Türkiye appear to have lower card penetration, which might be causing bias towards larger cities when predicting locations	Use of **specific MCCs** to find **tourism expenditures within the usual residence** of customers **Adjusting** for expenditures **when a person lives in one province and works in a different one** **Incorporating selected online transactions,** e.g. hotels, airline tickets, package tours Separating corporate id's and merchant cards from the total

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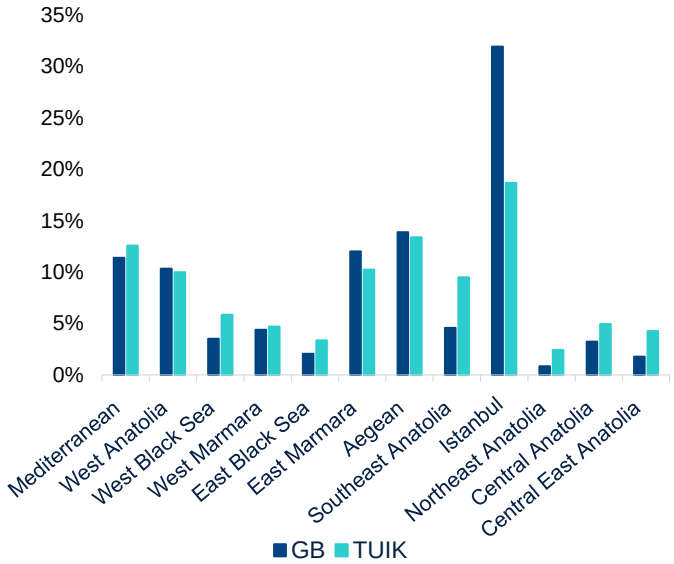
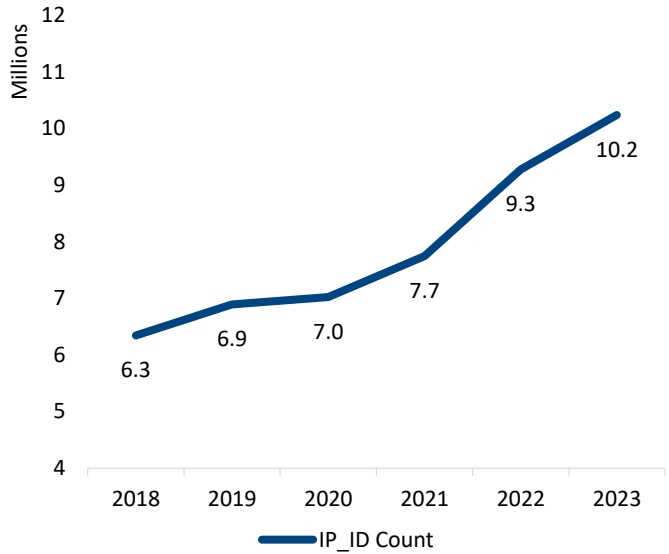
Appendix

Garanti BBVA predicted customer location data has a high Istanbul bias compared to official estimates

2023, LOCATION DISTRIBUTIONS OF GB CUSTOMERS VS. TUIK AGE >= 15



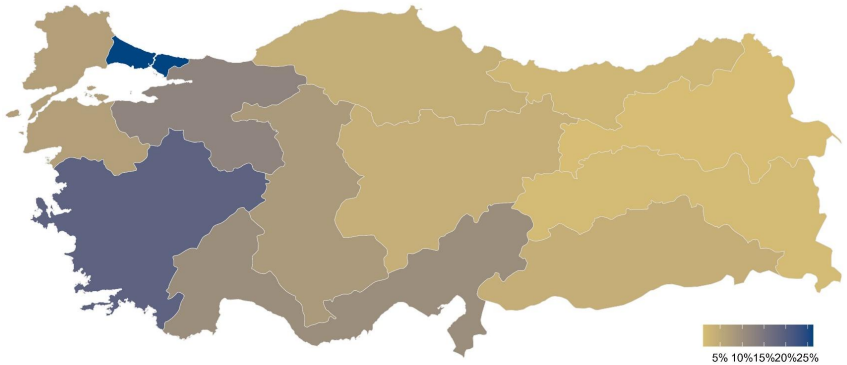
PREDICTED LOCATION COUNTS



Results from the estimated vs declared locations are 87% compatible for provincial level, comparison was made with 6.4M customers in 2023.

Geographical representation of the discrepancy of expenses to destinations

GB:
TOURISM SPENDING DISTRIBUTION (TL) ACCORDING TO NUTS1 CLASSIFICATIONS, 2022

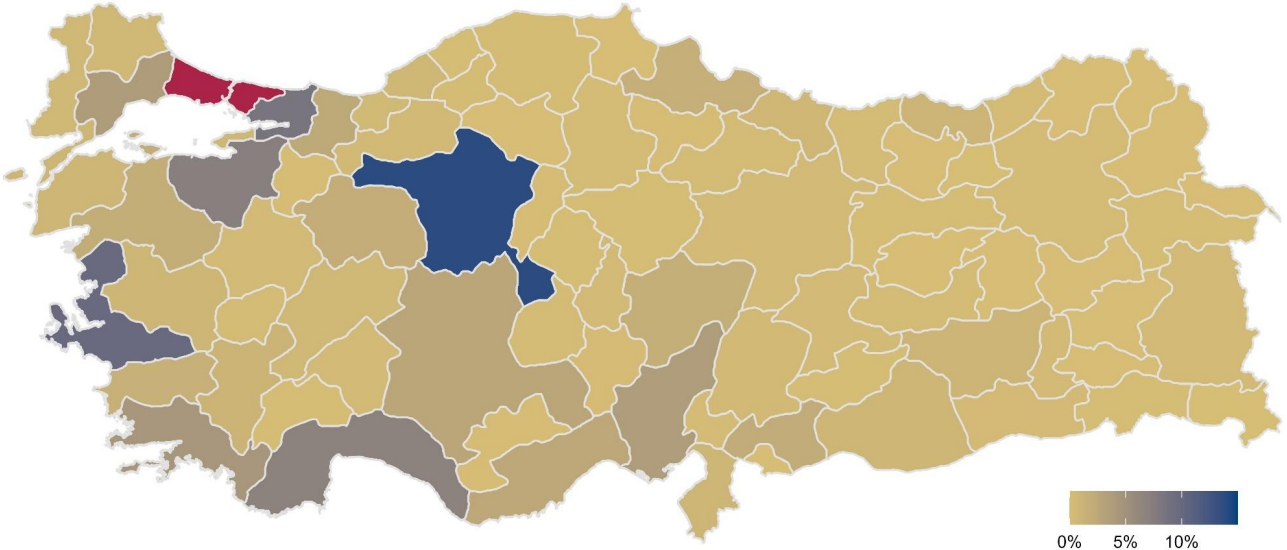


Source: Garanti BBVA Research

TUIK:
TOURISM SPENDING DISTRIBUTION (TL) ACCORDING TO NUTS1 CLASSIFICATIONS, 2022

Source: Garanti BBVA Research

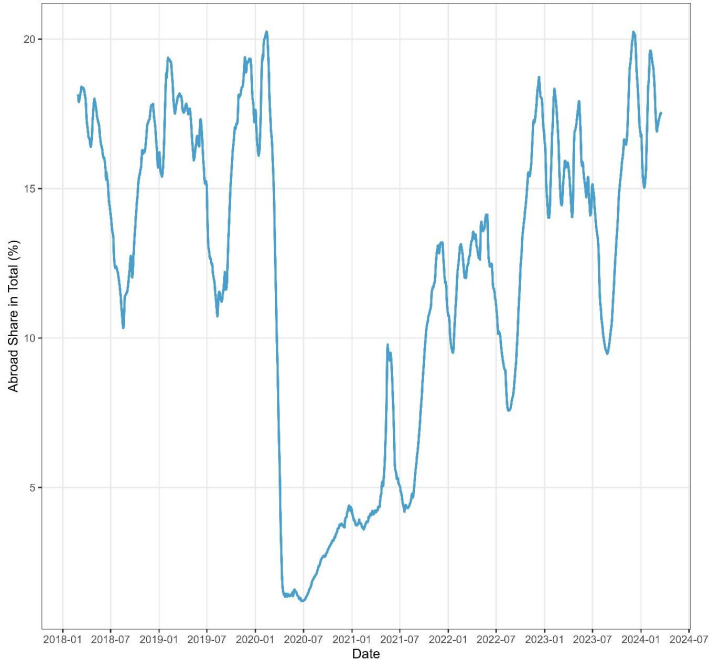
Distribution by usual residence, share in total expenditures made in Istanbul



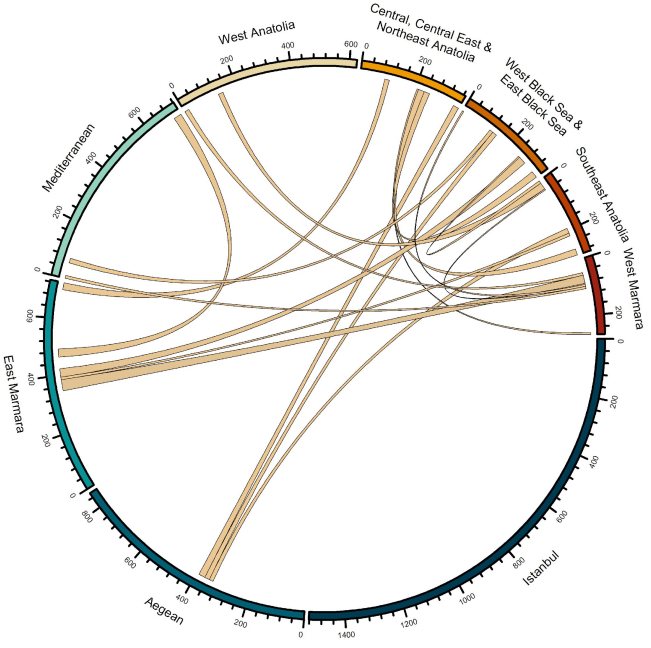
Source: Garanti BBVA Research

Abroad share in tourism spending is back to pre-pandemic levels

ABROAD SHARE IN TOURISM SPENDING BY GARANTI BBVA CUSTOMERS



2023 - BILATERAL FLOWS, MINOR LINKS (MN. USD)



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Interregional Spending Tracker – A Proxy to Track Domestic Tourism

Mert Zobi

June 2024

Creating Opportunities