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Using the Hedonic Price Model to Examine the Impact of Location on Room Rates in the East Black Sea Region (TR9)

Doğu Karadeniz Bölgesinde (TR9) Konumun Oda Fiyatları üzerine Etkisinin Hedonik Fiyat Modeli ile İncelenmesi

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Öz

Amaç: Bu çalışma, Doğu Karadeniz Bölgesindeki (TR9) konaklama tesislerinin fiyatlarını etkileyen unsurları araştırmayı amaçlamaktadır. Çalışmada özellikle tesis konumunun oda fiyatları üzerine etkisi araştırılmaktadır.

Tasarım/Yöntem: TR9 bölgesinde oda fiyatlarını belirleyen faktörleri tespit etmek için hedonik fiyat modelini (HPM) kullanacağız. 248 tane tesise ait oda fiyatları ve özellikleri trivago.com sitesinden elde edilmiştir. HPM'nin log-doğrusal formunu tahmin etmek için EKK yöntemi kullanılacaktır.

Bulgular: Bulgular, yıldız sayısının, tesis ve oda büyüklüğünün, otoparka, kumsala ve Arapça konuşan personele sahip olmanın oda fiyatları ile anlamlı ilişkisi olduğunu göstermiştir. Ayrıca, turistlerin hava alanına ve çoğunluğu yaylalarda yer alan ziyaret noktalarına yakın tesislere daha yüksek fiyat ödemeye istekli olduğu bulunmuştur. Bu nedenle, tesis konumu ulaşılabilirlik ve de yer seçimi açısından bölgedeki oda fiyatlarını farklılaştırmaktadır.

Sınırlılıklar: Veriler bir tesis arama motorundan elde edildiği için, bulgular tesisler tarafından sağlanan bilgilere dayanmaktadır. Ayrıca seyahat acentaları tarafından sağlanan fiyat verisi, neredeyse günlük olarak, değişmektedir. Son olarak elde edilen bulgular sadece TR9 bölgesi için geçerlidir; genelleştirilemez.

Özgünlük/Değer: Sahip olunan çeşitli özelliklerin oda fiyatları üzerine etkisi birçok çalışmada araştırılsa da bu çalışmanın özgün değerini bölge seçimi oluşturmaktadır. Çalışmada, HPM, belli oda ve tesis özelliklerinin oda fiyatları üzerine etkisini TR9 bölgesinde belirlemek için kullanılmıştır. Bölge, iklimi, coğrafik yapısı, doğası ve kültürel özellikleri ile diğer bölgelerden ayrışmaktadır.

Anahtar Kelimeler: Doğu Karadeniz Bölgesi, Oda Fiyatları, Konum, Hedonik Fiyat Modeli

Abstract

Purpose: This study aims to seek the attributes that influence the overall prices of lodging facilities in the East Black Sea Region (TR9). The particular impact of location on room rates is investigated.

Design/Methodology: We employ the hedonic price model (HPM) to determine what factors affect room rates in the TR9 region. The room rates and accommodation attributes for 248 accommodation establishments are obtained from trivago.com. To estimate the log-linear form of HPM, the OLS method will be employed.

Findings: The results show that star category, hotel and room size, parking, beach, and Arabic speaking staff are significantly associated with room rates. Moreover, tourists are willing to pay more for accommodations that are close to the airport and visiting sites which are mostly located in highlands in the region. Therefore, the location of accommodation establishments in the region explains the price differences in terms of accessibility and site selection.

Limitations: Since the data were collected from an accommodation search website, the findings rely on the information provided by each accommodation establishment. Also, the price information provided by travel agencies are subject to change, almost daily. Finally, the results obtained in this study cannot be generalised and they are only applicable to the TR9 region.

Originality/Value: Although the effects of certain attributes on room rates have been investigated in many studies, this study constitutes the original value through the choice of the region. HPM has been applied to determine the effects of certain room and establishment characteristics in TR9 region which is well-known by its climate, physical geography, nature, and cultural characteristics.

Keywords: The East Black Sea Region, Room Rates, Location, Hedonic Price Model

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1. INTRODUCTION

Turkey is one of the main tourist destinations in Europe as well as in the World. The country received 51.2 million visitors in 2019 and ranked 6th in the world and 4th in Europe following France, Spain, and Italy (UNWTO Barometer, 2021). The country attracts tourists in terms of several aspects. In recent years, the sector started to attract visitors for alternative forms of tourism such as sports, health, faith, and nature tourism along with sun-sea-and-sand tourism. According to the World Tourism Organization (UNWTO), Turkey is the 6th country in Europe and the 14th country in the world regarding the tourism revenue, it was around 30 billion dollars in 2019 (UNWTO Barometer, 2021). This figure constituted around 5% of GDP and 17% of total exports in the same year (WDI, 2022). The net tourism income for Turkey is positive and contributes positively to the current account deficit. Despite the destructive impact of the Covid-19 Pandemic, tourism is still one of the most prominent sectors in Turkey which represents around 8% of total employment (OECDstats, 2022).

Although Turkey is considered as a top-ranked tourist destination, the East Black Sea Region (TR9) of the country is a relatively virgin area in terms of tourism despite its potential. TR9 region is located in the north-eastern corner of Turkey, and it consists of six provinces (Artvin, Giresun, Gümüşhane, Ordu, Rize, Trabzon). Apart from Gümüşhane, all provinces are located along the eastern coast of the Black Sea. It is bounded on the east by Georgia. All provinces are considered as homogeneous in terms of climate, physical geography, nature and cultural characteristics. The region offers different forms of tourism thanks to its nature, cultural background and topographic variety. The touristic activities lie within a wide range from cultural tourism to ecotourism, from sightseeing to faith and gastronomic tourism. However, the tourism potential of the region has only been discovered recently.

The "Improving the Visibility and Accessibility of Eastern Black Sea Region Tourism Destinations project" has been commenced by the Eastern Black Sea Development Agency (DOKA) in 2011 in order to stipulate a sustainable economic and social development in the region through increasing tourism activities (Trabzon Provincial Directorate of Culture and Tourism, 2012). Since than the number of arrivals including both foreign and domestic visitors has been increased by around 40%. However, expenditure per person has started to decrease in the region due to increasing real estate purchases by domestic and foreign visitors. To prevent region to become a cheap tourist destination, the accommodation establishments in the region should consider tourists' demand. Therefore, it is of great significance to determine the factors that affect the room rates in the region to improve service quality and to increase revenue in the industry. It would also help to increase service variety in the industry to expand target customers. Thus, hedonic price method can be used as a pricing strategy in the region.

To this end, in this study, we aim to seek what factors influence the room rates in TR9 region within the hedonic price method framework. Along with some attributes (e.g., size of the establishment, room size, providing breakfast, star category, etc.), we investigate the implicit price of the location of the accommodation establishments through its importance for *accessibility* and *site selection*. Proximity to the centre, airports, and sites to visit would be the first criterium for the choice of accommodation. Therefore, tourists would be willing to pay more for accessibility of an accommodation. On the other hand, since the region is mostly visited for sightseeing and plateau tourism, and the provinces are located along the eastern coast of Black Sea, a room in nature or by seaside would be preferred by the visitors, which would be priced implicitly yet again. Hence, identifying these factors that customers pricing in is of great importance in terms of both establishment location decision and improving the existing establishment. Attracting more tourists by meeting their needs would increase profitability and improve the industry, which would eventually facilitate local economic development.

To investigate what factors influence the room rates in the region, we use the Ordinary Least Squares (OLS) estimations with robust standard errors. Standard room and establishment characteristics are accompanied by certain location variables such as distance to the city centre, distance to Trabzon Airport, and being located in nature and/or by seaside. The results show establishment characteristics such as hotels size, beach, parking, star category and Arabic speaking

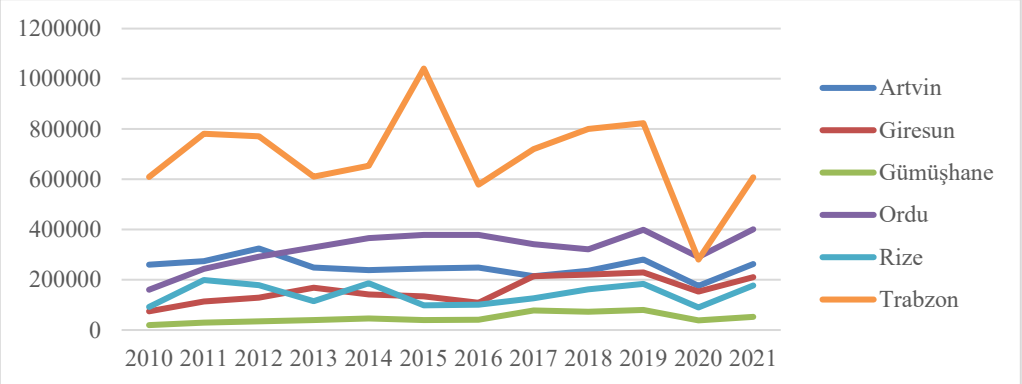
personnel are the price increasing factors in the region. Among all room characteristics, only room size has significant and positive effect on room rates. All location variables significantly impact the room rates in the region. Being close to visiting sites (museums, national parks, plateaus, etc.) and Trabzon Airport increases room rates while being close to city centre decreases room rates. The tourists are willing to pay more for rooms located in nature and by seaside, however being located in nature has a stronger price increasing impact in the region.

2. TOURISM IN THE EAST BLACK SEA REGION (TR9)

In recent years, the East Black Sea Region has become one of the tourist destinations due to many reasons such as untouched natural habitats, highland culture, and historical and cultural places. There are more than 100 sites in the region that have status of natural sites, national parks, or natural parks (Khan, 2020). Uzungol Natural Park, Karagol-Sahara Natural Park Sumela Monastry, Karaca Cave, Cape Yason are the most known sites in the region. TR9 region is preferred by visitors for High Plateau tourism as well. The most visited ones are Ayder Plateau, Kümbet Plateau and Cambasi Plateau. Besides these natural and cultural sites, the region has become famous in the last decade due to its potential for ecotourism. Recreational fishing, safari tours, climbing, diving, river sports and paragliding make the region as an ecotourism destination (Kaya &Yıldırım, 2020).

Figure 1 below shows the number of arrivals to the provinces since 2010. Apart from severe decreases in 2013 (Gezi Park Protests), 2016 (Russian Warplane Crisis) and 2020 (Covid-19 Pandemic), the number of arrivals tend to increase in all provinces since 2010. The number of arrivals shows the visitors spend the night in an accommodation establishment that is certified by the Ministry of Culture and Tourism or licenced by the municipal authority. However, number of tourists that visits the region is around 3 million on average within the period. Following the dramatic decrease in tourist arrivals in 2020 in the region due to the Covid-19 Pandemic, it is expected to rebound with 5 million visitors in 2022 (www.turizmajansi.com). Using the Autoregressive Integrated Average (ARIMA) model on the monthly data from 2002 to 2018, Khan (2020) projected that tourist arrivals in the region is expected to increase which would eventually make the region a popular tourist destination.

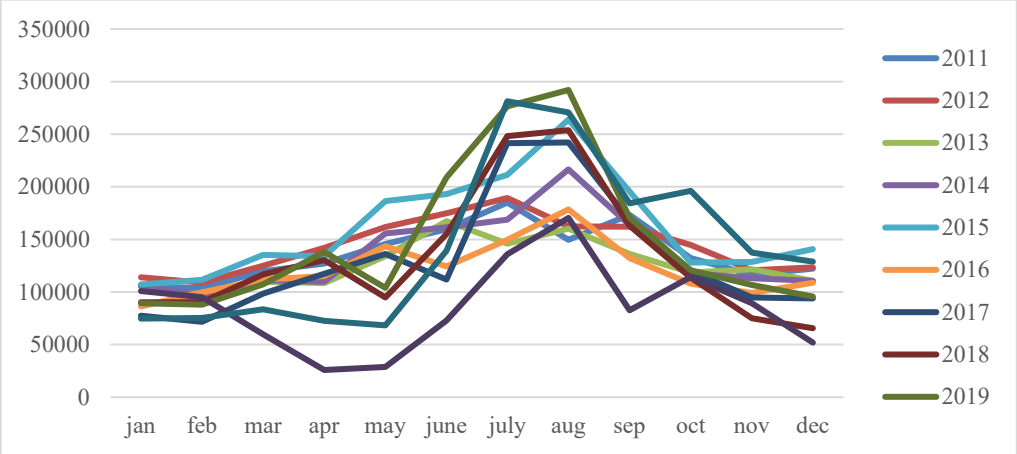
Figure 1: Number of Tourist Arrivals in Provinces in TR9 Region



Source: Republic of Türkiye Ministry of Culture and Tourism, 2022.

The tourism activities in the region displays high seasonality as most of the people prefers to visit the region in the summer months. Figure 2 shows the monthly arrivals in the region for the period of 2011-2021. Accordingly, the peak season lies between June and September. However, it is worth to mention that thanks to the investments made in recent years for the development of ski resorts, the region has started to attract tourists in the winter season too. There are five ski centres in the region. Zigana and Atabarı are the most known ones (DOKA Strateji Raporu, 2015).

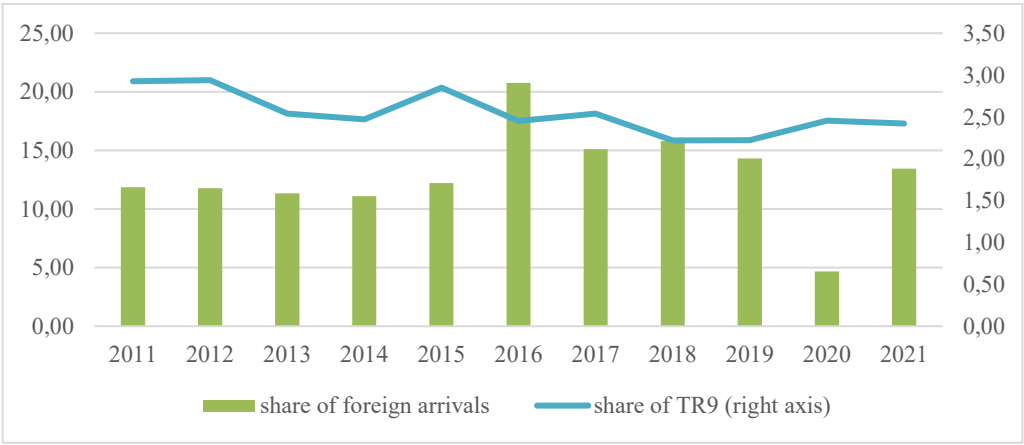
Figure 2: Monthly Tourist Arrivals in TR9 (2011-2022)



Source: Republic of Türkiye Ministry of Culture and Tourism, 2022.

Although the number of visitors is increasing every year, the share of the region in total arrivals in Turkey is decreasing. However, the share of foreing arrivals in total arrivals has an increasing trend since 2011. Figure 3 shows that the share of the region in total arrivals is around 2.5% while the share of foreign arrivals in the region's total arrivals is around 13%.

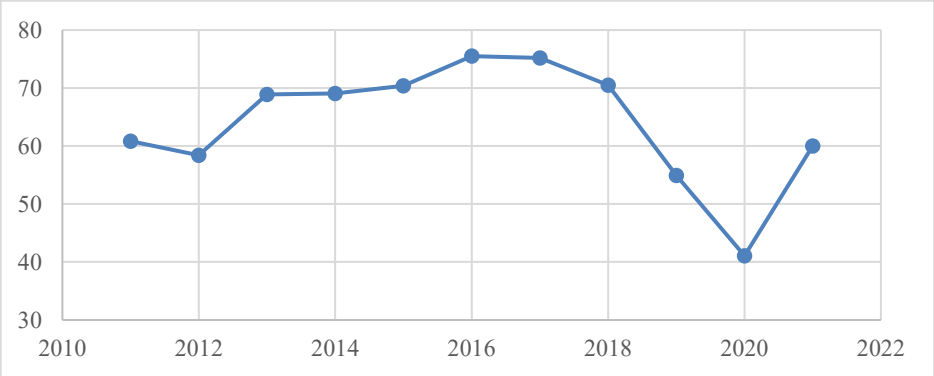
Figure 3: The Share of Foreign Arrivals in Total Arrivals in TR9 and the Share of TR9 Region in Total Arrivals in Turkey (2011-2022)



Source: Republic of Türkiye Ministry of Culture and Tourism, 2022.

When the foreign arrivals considered, it is observed that the region attracts tourist from a wide range of countries. However, throughout the last years both country composition and concentration have changed. In 2011, Georgia, Iran and Russia were the top three tourist origins, while in 2021 Jordan, Oman and Bahrain superseded these countries. Other countries that show interest to the region in recent years are the Gulf states of Saudi Arabia, Qatar, United Arab Emirates (UAE) and Kuwait. Figure 4 shows the share of first five countries in total arrivals in the region while Figure A1 displays the country composition changes in each province. Figure 4 depicts the high-country concentration in the region. Around 60% of the foreign arrivals are accrued by the top five countries.

Figure 4: The Share of Top Five Countries in Total Arrivals in TR9 (2011-2022)



Source: Republic of Türkiye Ministry of Culture and Tourism, 2022.

The change in country concentration is of great importance in terms of the tourism income. Increasing interest to the region by the rich Gulf countries would potentially promote the local economic development. According to DOKA (2015), increasing foreign arrivals to the region has improved the hospitality industry as well as affected the social life in the region. In the last few years, food and beverage, recreation and entertainment and transportation and travel services have benefitted from the increasing demand for goods and services thanks to increasing interest to the region. Moreover, demand for real estates has increased as well, which has a reverse effect on hospitality industry. The decrease in the expenditures per person is explained by both increasing real estate purchases and unregistered accommodation transactions (i.e. renting houses instead of staying in a hotel) (www.turizmajansi.com; Düzgün & Ödemiş, 2020).

In order to increase tourism income along with the increasing arrivals, the region should increase the service quality in the hospitality sector and promote diversity in tourism facilities to expand arrivals to the whole year. To prevent becoming a cheap tourist destination, the accommodation establishments in the region should consider tourists' demand. They should focus on attributes that tourists assign more value while determining their pricing strategy. Thus, they will direct their resources according to their customers' needs.

To determine the level of development related to the tourism industry in Turkey, Kervankıran and Eteman (2020) established a tourism index for each province. The results showed that two out of six provinces (Ordu and Trabzon) in the TR9 region are lie in the second-degree tourism-led development category while the rest are in the third category. This implies that tourism industry would have an important role in the region's economic development. Therefore, it is of great importance to detect what factors affect the room rates in the region to improve service quality and to increase revenue in the industry. It would also help to increase service variety in the industry to expand target customers.

3. RESEARCH CONTEXT AND THE EARLIER STUDIES

To investigate the factors affecting accommodation prices in the TR9 region, we employ the hedonic price model (HPM). It is a widely used approach to identify the implicit prices embedded in heterogeneous products. Although it has been implicitly used in early studies (Wallace, 1926; Waugh, 1928; Court, 1939; Houthakker, 1952), it has become popular by the theoretical contributions by Lancaster (1966) and Rosen (1974). Considering objectively assemble and identifiable characteristics (attributes) of heterogeneous goods, Lancaster (1966) reformulated the consumer behaviour theory. Based on Lancaster's preference theory, Rosen (1974) is the first study that modelled market equilibrium supply and demand by the characteristics of products. This equilibrium maximizes both consumer's utility and producers' profit under perfect competition. The model uses the conventional utility maximization procedure, but it derives implicit prices for each characteristic the product has. Each -homogeneous- characteristic which has a unique implicit price in equilibrium, associates the heterogeneous product itself.

HPM is a pricing strategy that assumes the price of a product is a function of its characteristics which also determines its utility (Thrane, 2005). The interaction between firms and consumers provides separate implicit price for each attribute. This implicit price reflects the marginal price of a characteristics which is equal to the average willingness-to-pay by the consumer for an extra unit of that characteristic embedded in the product. It is the value assigned by the consumer to a certain characteristic based on the utility perceived from that characteristic (Goodman & Thibodeau, 2003). However, it also reflects the marginal cost in the firm's side since it is the amount of money for which firms are willing to spend to add that characteristics to the product.

The model works under perfect competition that assumes the absence of transaction and information costs (Falk, 2008). Both consumers and producers are fully aware of the preference and cost functions. Therefore, the equilibrium signifies marginal values for small changes in each attribute. Thus, the results are valid in the short run since in the long run firms make zero profit (Rigall-I-Torrent & Fluvià, 2011). However, Andersson (2008) states that the results from HPM would be valid in lodging market even under imperfect information.

As in any products that can be decomposed into different attributes, HPM can be used to determine implicit prices for each attribute based on the utility it provides in the tourism related products. Services in the lodging sector provides satisfaction based on its components. Each establishment differ from each other depending on these attributes and values. Utility from each attribute depends on the service characteristics (Oh et al., 2009). If a customer (tourist) derive utility from swimming pool, for example, he/she would price it, that will affect the final price of the service eventually.

Following the pioneering study by Rosen (1974), many researchers have applied the HPM in different markets such as housing, automobiles, computers. It has even been used for environmental services such as air pollution, noise, and similar externalities (Chen & Rothschild, 2010). Studies that apply the model in tourism industry is rather recent but numerous. They considered the attributes that belong to the accommodation establishment such as size of hotel, age of hotel, affiliation of the hotel, star category, room features (room size, TV, wi-fi, minibar, air-conditioning, etc), establishment features (carpark, swimming pool, fitness centre, etc.) and attributes which cannot be controlled by establishments such as timing of the booking, location and customer reviews. The former ones are considered as internal drivers where the latter ones are external drivers of room rates (Chen & Rothschild, 2010). Some studies have evaluated the impact of several attributes on hotel room prices (Espinet, 2003; Tung et al., 2011; Andersson, 2008; Chen & Rothschild, 2010) whereas some studies focussed on the effects of these attributes in different types of lodging facilities (ski resorts (Falk, 2008; Rosson & Zirulia, 2018); Airbnb (Chen & Xie, 2017; Gibbs et al., 2017; Tong & Gunter, 2020); Resorts (Papatheodorou, 2002); Bed and Breakfasts (B&Bs) (Monty & Skidmore, 2003). Juaneda et al. (2021) compared the effects of same set of room attributes for coastal hotels and apartments.

There are studies focusing on the effect of a certain attribute. Soler and Gemar (2016) has employed hedonic price models to assess the impact of legal status as a family business hotel where Thrane (2007) investigated the effect of being a member of a hotel chain. Rigall-I-Torrent and Fluvia (2007, 2011) focussed on the importance of public goods in hotel room prices in Catalonia. In addition, many researchers have applied HPM to analyse the effects of environmental sustainability in lodging market (Kuminoff et al., 2010; Sanchez-Ollero et al., 2013; Garcia-Pozo et al., 2013; Soler et al., 2016)

Among all other aspects, star category, customer reviews, time and location are the most discussed variables in HPM literature in lodging market. Israeli (2002) and Abrate et al. (2011) used HPM to display the significant impact of star category on hotel prices in Israel and Turin, respectively. Liu (2016) showed that customer ratings positively affect room prices in China whereas Wang et al. (2019) have showed that customer reviews eliminate to some extend the negative seasonal effects on hotel prices for mid- and low-priced hotels. Regarding the timing of the hotel prices, Schamel (2012) revealed that hotel room prices depend on the booking day. Accordingly, whether hotels are booked for weekdays or weekends explains the price differences in Bolzano hotels. With the same intuition, Herrmann and Herrmann (2014) discussed the altering prices due to large events by applying HPM on

hotels in Munich. Along the same lines, Monty and Skidmore (2003) and Wang et al. (2019) confirmed the importance of seasons for hotel room prices in Wisconsin and Sanya, respectively.

The effect of location on room rates has been discussed in many studies. Fleischer (2012) analysed the impact of sea view on room prices in nine regions located around the northern Mediterranean. Rigall-I-Torrent et al. (2011) investigated the effect of beaches on hotel room rates, while Lee and Jang (2010) examined the effects of hotels' proximity to business centres and airports on room rates and showed that being close to both locations increase prices in Unites States airport hotels. Alegre et al. (2013) showed that location attribute significantly affects hotel room rates. Their findings revealed that the distance to beach negatively affects prices for both German and British package holidays whereas the sign of the distance to the centre of the tourist resorts variable differs from each other in British and German tourism. Salo et al. (2014) compares the effect of location along with the other price determinant for hotels and second houses. Zhang et al. (2011) and Soler and Gemar (2018) investigate the effect of location on room rates using spatial econometrics (i.e., geographical weighted regression) within HPM framework.

Our work lies in the last strain of the literature which focus on the effects of location on room rates. Location of an establishment determines its proximity to attractions, transportation points and city centres which, along with other attributes, would shape consumer decision (Yang et al., 2016). Since most of the visitors prefer the East Black Sea Region for sightseeing and plateau tourism, the choice of accommodation is directly related to its location. Therefore, location could be a differentiating attribute over rivals and would lead to comparative advantages. Thus, it is of great importance to investigate its effects on room rates.

There are other studies that examine the determinants of room rates in longing sector in Turkey. Three of them apply HPM to analyse the effects of certain attributes on hotel room prices for sun-sea-and-sand tourism in Antalya and Muğla provinces (Kesbiç et al., 2011; Üstündağ & Işık, 2018; Yalçın & Mert, 2018), while one focuses on 20 hotels in Erzurum which is a famous winter destination thanks to skiing facilities (Işık & Bilici, 2016). We apply HPM to determine the effects of certain room and establishment characteristics in TR9 region that consists of six provinces which are well-known by their climate, physical geography, nature, and cultural characteristics. The region attracts tourists mostly in summer season, however, thanks to five ski resorts located in the region, it has started to attract tourists in the winter season too. Therefore, our work can be separated from the existing ones thanks to the choice of region which has wide-range tourism activities. Moreover, there are different types of establishments that offer lodging services in the region. Hotels, apartment hotels, boutiques, chalets, log cabins, B&Bs, pensions are the examples of the lodging facilities in the region. Our study allows us to compare the impact of certain attributes for hotel-type accommodations with non-hotel type ones. Finally, since the region is usually preferred due to sightseeing and highland culture, we aim to examine the particular effect of location on room rates.

4. MODEL SPECIFICATION AND ANALYSES

4.1. Data and Methodology

To determine the factors affecting room rates in the TR9 region we employ the hedonic pricing framework. Following Rosen (1974), many studies used the model to show the relationship between the price of a differentiated product and the amount of attributes that comprise the product to determine the implicit price of each attributes. Based on Lancaster's consumer theory, Rosen (1974) showed how heterogeneous products are made up different characteristics which explains the price of the product. The model enables to estimate the marginal price of each characteristic which reflects consumer's willingness to pay. The marginal price also reflects the marginal cost since it is the amount of the money for which firms are willing to embed the characteristics in the final product. Since hotels are considered as multi-attribute products, HPM can be used to investigate determinants of hotel prices as well.

The general specification for the hedonic price equation is:

$$P_i = \alpha + \sum \beta_k a_{ik} + \varepsilon_i$$

where a_{ik} represents the bundle of accommodation attributes ($a = (a_1, a_2, a_3, \ldots., a_k)$) each accommodation establishment (i) has. It contains information on establishment itself (type, chain, star category, size, etc…), establishment characteristics (facilities such as parking, spa, swimming pool, etc…) and room characteristics (size, breakfast, air conditioner, etc…). The implicit price of each attribute is $\partial(P_i)/\partial a_{ik}$. It reflects both consumers' willingness to pay and firms' willingness to bear the cost of the attribute to embed in the final product. In most studies, cross-sectional data are used to avoid unstable contribution of the attributes to the value (Palmquist, 2005).

Following the mass strain of the existing studies, we employ a log-linear model. Hamilton (2007) showed that it outperforms other functional forms. Moreover, using log of price also eliminates and/or mitigates possible heteroskedasticity and would improve explanatory power by narrowing the distribution. The model we estimate is:

$$\ln(P_i) = \alpha + \sum \beta_k a_{ik} + \beta_L Loc_i + \varepsilon_i$$

Along with the room and establishment characteristics, we include variables related to the location (Loc_i) of each establishment. By estimating this model, we aim to determine what factors influence the room rates in TR9 region. Additionally, we particularly seek whether the location explains the price differences among accommodation establishments in terms of accessibility and site selection. The list of the variables is presented in the table below.

Table 1. Variables and Their Definition*

	Variable	Description of variable
Dependent Variable	Logprice	Log room rate per night
Hotel Information	Type	Is the accommodation type hotel? (Yes=1)
	Chain	Is the hotel a chain hotel? (Yes=1)
	Star	Does the hotel have 4 or 5 stars? (Yes=1)
	Size	Total number of rooms in the accommodation
Location Information	Location_Provice	Is the hotel in a province? (Yes=1)
	Location_Nature	Is the hotel in nature? (Yes=1)
	Location_Sea	Is the hotel by the sea? (Yes=1)
	Disttoairport	Distance to Trabzon Airport (km)
	Disttocentre	Distance to the centre of each province (km)
	NoD_50	Number of visiting sights within a radius of 50 km
Room Information	Breakfast	Is there free breakfast in the hotel? (Yes=1)
	Room Size	Room size (square meters)
	Air Conditioner	Is there air conditioning in the room (Yes=1)
	Television	Is there television in the room (Yes=1)
	Bath	Is there bathroom in the room (Yes=1)
	Wi-Fi	Is there free Wi-Fi in the room (Yes=1)
Facilities	Beach	Does the hotel have a private beach? (Yes=1)
	Pool	Does the hotel have a swimming pool? (Yes=1)
	Spa	Does the hotel have spa or sauna or Turkish bath or massage? (Yes=1)
	Fitness Centre	Does the hotel have a fitness centre? (Yes=1)
	Parking	Does the hotel have a free parking lot? (Yes=1)
	Restaurant	Does the hotel have a restaurant? (Yes=1)
	English	Does the hotel have English speaking staff? (Yes=1)
	Arabic	Does the hotel have Arabic speaking staff? (Yes=1)
	Russian	Does the hotel have Russian speaking staff? (Yes=1)
	Georgian	Does the hotel have Georgian speaking staff? (Yes=1)

* "Hotel" refers to both hotel and non-hotel type accommodation establishments. Hotels and boutiques are categorized under the hotel-type accommodations while apartment hotels, chalets, log cabins, B&Bs and pensions are categorized under the non-hotel type accommodations.

The data include 248 accommodation establishment from six provinces in TR9 region. This constitutes almost half of the establishment and around %60 of existing number of beds in the region. Data were collected through convenience sampling method from trivago.com which is an accommodation search website and provides price information through the travel agencies. There are alternative websites, and each search website is working with different set of travel agencies with different price offers. To avoid these differences, we used the most common search website, trivago.com. Since they provide information about hotels in a standardized, accessible format, online travel agencies are preferred in most studies (Andersson, 2018). The least expensive price for a standard double room was obtained on April 22, 2022, for a one-night stay on July 23, 2022. As shown in Figure 2, this date is from the high season, but it does not coincide with any large events in 2022.

The data we collected from trivago.com covers other variables such as child swimming pool, beauty salon, hairdresser, meeting room, laundry etc. However, to avoid the multicollinearity problem, these were dropped because of the high correlation based on the correlation matrix. Nevertheless, removing them does not guarantee structural significance of the model. Therefore, in a second stage, the variance inflation factor (VIF) was used to detect whether there is severe multicollinearity between the independent variables included in the model[1]. We excluded customer ratings variable from the analysis since it causes loss of almost 20% of the observation. There are other variables we dropped based on the summary statistics. Firstly, because 15 out of 16 accommodations with a chain affiliation has 4 or 5 stars, this variable has been excluded from the models as well. Next, the English and Georgian variables are dropped since the former one is spoken in most of the lodging establishments and the latter one is observed in a limited number of establishments in Artvin province. Finally, internet, television and bath variables are excluded from the analysis since they are observed in most of the accommodations. The summary statistics regarding the variables are given in Table 2 below.

Table 2. Descriptive Statistics of the Continuous Variables and Dummies

Continuous Variables				
Variable	Mean	Std. Dev.	Min	Max
price	1001.94	576.91	249	3950
logprice	6.766	0.532	5.517	8.281
hotel_size	41.234	45.025	3	350
room_size	25.786	11.825	4	80
disttocentre	36.500	33.711	0.24	113
disttoairport	106.666	82.834	1.20	302
NoD_50	24.294	7.256	5	40
Dummies				
Variable	Mean	Std. Dev.	Frequency	Percent
Location_Province	0.403	0.492	100	40.32
Location_Nature	0.395	0.490	98	39.52
Location_Sea	0.206	0.405	51	20.56
Type	0.815	0.389	202	81.45
Chain	0.065	0.246	16	6.45
Star	0.185	0.389	46	18.55
Air Conditioner	0.734	0.443	182	73.39
Television	0.940	0.239	233	93.95

[1] VIF is a method for detecting the seriousness of multicollinearity. According to Kennedy (2008, p.199), if a VIF value is greater than 10, then multicollinearity is a serious problem. A VIF value less than 10 indicates the absence of such a problem.

Bath	0.996	0.064	247	99.6
Minibar	0.810	0.393	201	81.05
Breakfast	0.802	0.399	199	80.24
Internet	0.992	0.090	246	99.19
Beach	0.065	0.246	16	6.45
Pool	0.145	0.353	36	14.52
Spa	0.230	0.422	57	22.98
Fitness	0.177	0.383	44	17.74
Parking	0.899	0.302	223	89.92
Restaurant	0.871	0.336	216	87.1
English	0.960	0.197	238	95.97
Arabic	0.488	0.501	121	48.79
Russian	0.133	0.340	33	13.31
Georgian	0.048	0.215	12	4.84

Note: 248 observations. The frequency value is the frequency of the dummy variable whose value is 1.

Along with the variables extracted from trivago.com, we use two sets of location variables to detect how location matters for room rates in the region. The first set of location variables aim to investigate the effect of *accessibility* on room rates. These variables are distance to province centre (disttocentre), distance to airport (disttoairport) and the number of visiting sites close to each accommodation within a circle with a 50 km radius (NoD_50). The first two are directly collected from Google Map while the last one is calculated based on the coordinates of over 120 places using the same source. These visiting cites includes museums, churches, mosques, plateaus, waterfalls, caves, castles, etc. Although currently there are three airports in the region, Rize-Artvin Airport was not active by the time of data collection and the number of flights from/to Ordu-Giresun Airport is limited. Therefore, the distance to airport variable considers the distances of each accommodation establishment to Trabzon Airport only. Many studies showed that the room rates decrease as distance to airport increases since traveling to/from the hotel is considered an additional cost (Lee & Jang, 2010; Alegre et al., 2013) Although, it is detected the opposite in the existing literature, since being close to city centre means being close to shopping centres and restaurants (Monty & Skidmore, 2003; Lee & Jang, 2010; Soler & Gemar, 2018), we expect a positive coefficient for the disttocentre variable as well. This can be explained by both demand and supply side. The tourists visit the region because of the highlands and visiting sites in the region. Therefore, they would be willing to pay higher price for the accommodations that are closer to these places. On the other hand, it costs more to build hotels in highlands and mountains and logistic services to these hotels cost more as well. Hence, the owners are willing to charge more for these rooms. Finally, as it will be more convenient to visit close by destinations, we anticipate the increasing number of destinations to add up room rates in the region.

The second set of location variables measures the impact of the *choice of establishment site.* Since the region is mostly visited for sightseeing and plateau tourism, the choice of accommodation establishment is directly related to its location. The location_province variable shows whether the accommodation establishment is located in a city instead of in a town. This variable aims to detect the price effect of being located in cities compared to being located in towns. The location_nature and location_sea variables show if the establishment is located in nature or by seaside respectively. These two variables aim to determine whether the room prices in establishments located in nature and/or by seaside significantly differ from the ones located in city centres. We expect a positive coefficient for both variables, but a stronger coefficient for the location_nature variable since the region is preferred by visitors for highland culture mostly.

As mentioned before, the TR9 region consists of six provinces (Artvin, Giresun, Gümüşhane, Ordu, Rize, Trabzon). Table 3 shows the number of accommodations located in each province. Accordingly, the number of accommodations obtained for each province vary from 4 (Gümüşhane) to 96 (Trabzon). And in each province, the accommodations are located by the sea or in highlands or in city centres. For example, 79.41% of Rize accommodations are located in highlands whereas only

7.35% is located by the sea. Since Gümüşhane is a landlocked province, there is no accommodation establishment located by the sea in this province. In Rize and Artvin, the accommodations are mostly located in highlands and mountains whereas in Trabzon they are mostly in the city centre. Although there is no clear difference between the average prices of accommodation located by seaside and accommodations located in nature, both are higher than the city centre accommodations. The price of a room for seaside located accommodations is on average 37% higher than the ones located in city centre while accommodations located in mountains and plateaus are 22% more expensive than the ones located in city centre.

Table 3. Distribution of Number of Accommodations among Provinces

Province	# of Accommodation	(%)	Nature (%)	Sea (%)	City Centre (%)
Artvin	24	9.68	62.50	12.50	25.00
Giresun	22	8.87	18.18	40.91	40.91
Gümüşhane	4	1.61	25.00	0.00	75.00
Ordu	34	13.71	17.65	47.06	35.29
Rize	68	27.42	79.41	7.35	13.24
Trabzon	96	38.71	18.75	18.75	62.50
Total	248	100			

Note: 202 out of 248 accommodations are hotel-type which contains hotels and boutiques only.

To estimate the log-linear function given in Equation 2, we employ the OLS regression. The coefficients from log-linear regression are interpreted as the percentage change in the dependent variable for every unit increase in the independent variable[1]. Both Link test and Ramsey RESET test have been applied to test the model specification. They show that our regression is specified appropriately. Three different specifications of this equation have been estimated using White heteroskedasticity robust estimator of the variance–covariance matrix[2]. The results are interpreted in the following section.

4.2. Results

To determine what factors affect the room rates in TR9 region, we estimate three different models. The first model includes room and establishment specific characteristics only. In the second model we introduce the first set of location variables to investigate the effect of *accessibility* on room rates. The contribution of the location of an establishment to room rates in terms of *site selection* is searched in the third model. All models are presented in columns (1), (2) and (3) in Table 4, respectively.

The results are mostly robust to changes in the specifications. Among establishment chactersitics, star category and size variables are the statistically significant ones while room size is the only significant variable among room characteristics. Although the hotel-type accommodations charge less than non-hotel type accommodations, as expected, according to the estimated coefficients, it is not significant in all specifications. This result might be the consequence of the data collection process. There are multi-type accommodations in the region, that is they provide more than one type of accommodation services. Especially some accommodations in Ayder and Uzungöl offer rooms in chalets, log cabins as well as hotels simultaneously. However, since we collected cheapest price for a standard double room, in most cases these rooms were categorized under the hotel-type accommodaton. This has diminished the number of non-hotel type accommodations in the dataset, which would result the insignificant price differences between hotel and non-hotel type accommodations. Regarding the facilities provided by each accommodation establishment, having a

[1] This interpretation is valid for continuous variables. To obtain similar information from dummy variables, the estimated coefficient (β) needs to be transformed by $(e^{\beta} - 1)$x100, where e is the base of the natural logarithm.
[2] To detect heteroscedasticity in the model White test and Breusch-Pagan test have been applied. Both tests have not rejected the null hypothesis of constant variance.

private beach, parking and Arabic speaking staff significantly contributes to the room rates in all models. Multicollinearity is not a problem since the mean VIF in all three specifications is less than 10 and range from 1.71 to 1.92.

Even though the estimated coefficients for significant variables are similar across all models, including location variables slightly changes these coefficients. All location variables are statistically significant and except the distance to city centre variable, they have the expected signs. The impact of accessibility on room rates can be observed in column 2. The room rates are decreasing as distance to Trabzon Airport increases. A ten km increase is associated with 1% decrease in room rates. However, the room rates are increasing as distance to city centre increases. A ten km increase is associated with almost 4% increase in room rates. Finally, an increase in number of visiting site close by the accommodation has a significantly positive impact on room rates.

Together with the location variables associated with accessibility, we include three location variables to examine the effect of site selection. Being located in cities increases room rates by 17.35% compared to the ones located in towns. The price of an accommodation establishment located in nature and by seaside rises the price by 50.38% and 22.75% respectively, compared to the ones located in centres.

Table 4. Regression Results

		(1) Main	VIF	(2) Accessibility	VIF	(3) Location	VIF
Hotel Information	Type	-0.115	1.40	-0.0701	1.45	-0.0779	1.46
		(-1.26)		(-0.79)		(-0.85)	
	Star	0.336***	2.74	0.379***	2.79	0.278***	2.78
		(3.07)		(3.40)		(2.61)	
	Hotel_Size	0.00355***	2.22	0.00277***	2.44	0.00388***	2.26
		(4.54)		(3.58)		(5.01)	
Room Information	Breakfast	-0.0106	1.20	-0.00787	1.24	0.00559	1.21
		(-0.13)		(-0.10)		(0.07)	
	Room_Size	0.0120***	1.23	0.0112***	1.25	0.0120***	1.23
		(4.09)		(3.92)		(4.35)	
	Air Conditioner	-0.146*	1.44	-0.0698	2.10	0.00560	2.15
		(-1.68)		(-0.67)		(0.05)	
	Mini_Bar	0.115	1.41	0.120	1.43	0.128	1.42
		(1.15)		(1.22)		(1.28)	
Facilities	Beach	0.199**	1.15	0.244**	1.20	0.191*	1.28
		(2.11)		(2.35)		(1.88)	
	Pool	0.0112	2.24	0.0570	2.29	-0.0785	2.31
		(0.10)		(0.49)		(-0.71)	
	Spa	-0.0972	3.44	-0.0880	3.44	-0.0967	3.47
		(-0.86)		(-0.75)		(-0.93)	
	Fitness	-0.197*	2.71	-0.165	2.75	-0.129	2.90
		(-1.72)		(-1.41)		(-1.18)	
	Parking	0.285***	1.12	0.289***	1.13	0.233***	1.15
		(3.11)		(3.41)		(2.79)	
	Restaurant	0.0295	1.19	0.0462	1.25	0.00559	1.23
		(0.31)		(0.50)		(0.06)	
	Arabic	0.211***	1.09	0.128**	1.36	0.206***	1.11
		(3.74)		(2.07)		(3.66)	
	Russian	-0.0930	1.10	-0.118	1.13	-0.0718	1.12
		(-1.00)		(-1.27)		(-0.76)	
Location 1	NoD_50			0.0102*	2.03		
				(1.80)			
	Disttoairport			-0.00101*	3.00		
				(-1.86)			
	Disttocentre			0.00338***	2.22		
				(2.73)			
Location 2	Location_Province					0.160**	1.95
						(2.24)	
	Location_Nature					0.408***	2.84
						(4.50)	
	Location_Sea					0.205**	1.59
						(2.49)	

Constant	6.036***	5.725***	5.666***
	(34.01)	(21.36)	(30.60)
# of Obs.	248	248	248
Rsquare	0.358	0.401	0.409
F stat	10.34	10.73	12.08
Mean VIF	1.71	1.92	1.86

t statistics in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Location 1 variables search the effect of accessibility while Location 2 variables investigates the impact of site-selection on room rates.

5. CONCLUSION

This study employs a hedonic price model to examine the significance of selected hotel attributes that determine the room rates in the East Black Sea Region. We offer findings regarding the importance of location as well. While some variables such as star category, establishment and room size, parking, beach, and Arabic speaking staff are significantly associated with room rates, some variables such as type of the accommodation, breakfast, minibar, fitness centre, spa and pool do not have statistically significant impact on room rates in the region. Moreover, the results show that the choice of establishment site matters for consumers' preferences. Tourists are willing to pay more for accommodations that are close to the airport and visiting sites which are mostly located in highlands in the region. This finding is supported with an alternative model specification which introduces a dummy variable to determine the implicit price of being located in nature. Accordingly, the tourists are willing to pay more for rooms located in nature, and compared to the accommodations located by seaside, being located in nature has a stronger impact on room rates.

These findings matter for policy-makers and hotel managers to a large extent. First, it is evident that although number of visitors is increasing every year, expenditure per person has started to decrease in the region due to increasing real estate purchases by domestic and foreign visitors. Therefore, the hotel managers should consider tourists' demand to improve their service quality. This will eventually increase individual utility by increasing price. They should focus on attributes that tourists assign more value while determining their pricing strategy. Otherwise, the region would become a cheap tourist destination. The managers can also use the estimates for promoting their products. They can advertise the attributes with higher marginal price.

Also, to increase tourism income along with the increasing arrivals, the region should promote diversity in tourism facilities to expand arrivals to the whole year. The local authorities should improve the visiting sites with additional infrastructural investments since the region is mostly preferred for sightseeing and highland culture. Hence, considering the attributes the customers are willing to pay more is great importance in terms of both establishment location decision and improving the existing establishment. Attracting more tourists by meeting their needs would increase profitability and improve the industry, which would eventually facilitate local economic development.

It is worth to mention that this study has some limitations that must be considered. First, it is important to note that collecting data from an accommodation search website means the reliability of the findings is limited to the reliability of the information provided by each accommodation establishment. Second, it is evident that the price information provided by travel agencies are subject to change, almost daily. The data is collected on a date for a further date. Changing the day of data collection would most probably change the price information. This constitute another weakness of the data. As a final point, the results obtained in this study, although they are in line with the existing literature, cannot be generalised and they are only applicable to the TR9 region. Despite these limitations, the findings regarding the importance of certain attributes along with location cannot be disregarded

To overcome data-related weaknesses, future research might collect data directly from consumers through surveys to associate attributes and price. This would allow to analyse stated preferences instead of revealed preferences. Moreover, the interaction among accommodations located close to each other should also be investigated as a price determinant. Finally, by considering more dates throughout the year would help to examine the effect of seasonality on room rates.

Etik Beyan: *Bu çalışmada "Etik Kurul" izini alınmasını gerektiren bir yöntem kullanılmamıştır.*

Yazar Katkı Beyanı*:1. Yazarın katkı oranı %50, 2. Yazarın katkı oranı ise %50'dir.*
Çıkar Beyanı*: Yazarlar arasında çıkar çatışması yoktur.*

Ethics Statement: *In this study, no method requiring the permission of the "Ethics Committee" was used.*
Author Contributions Statement: *1st author's contribution rate is 50%, 2nd author's contribution rate is 50%.*
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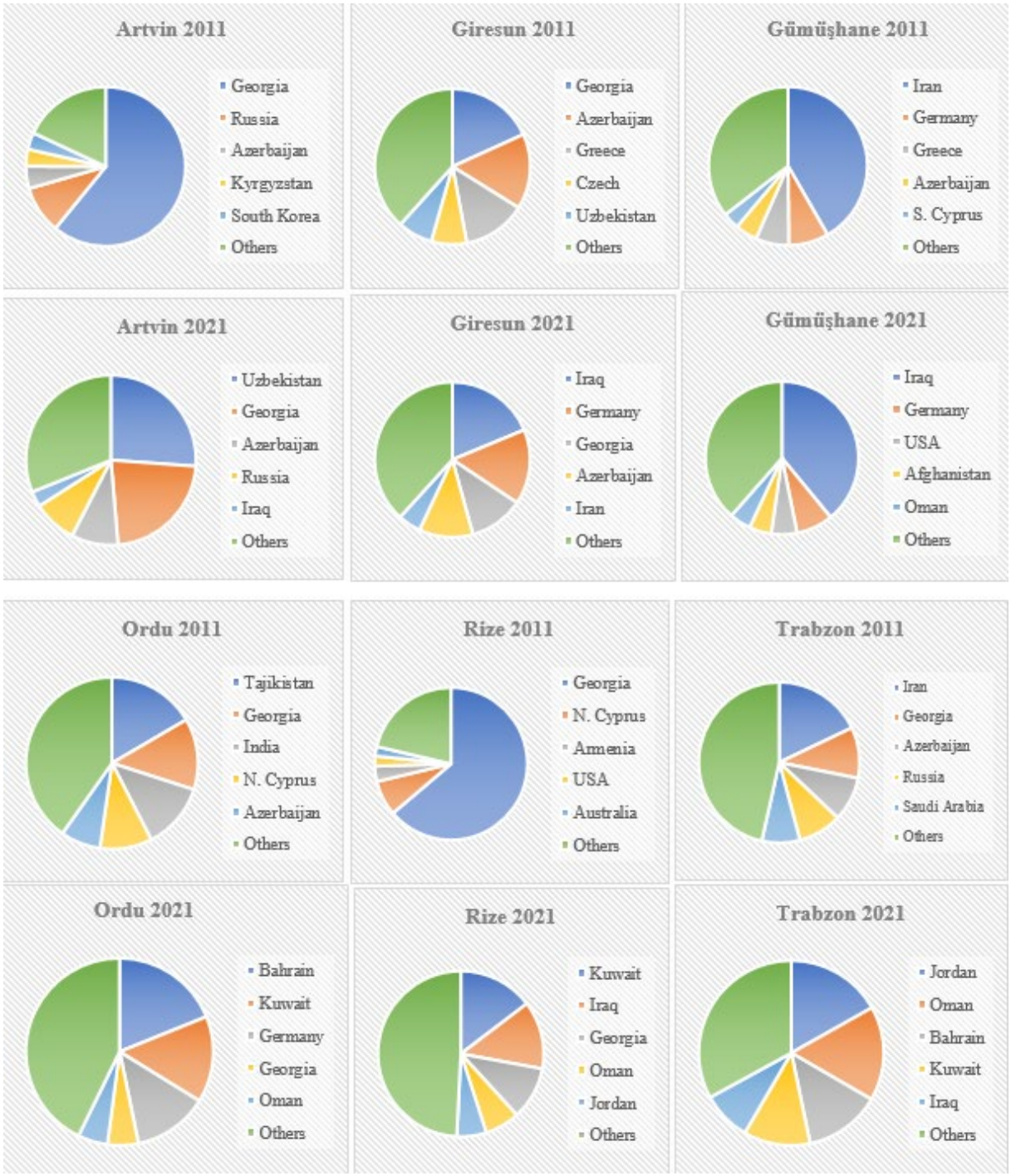
APPENDIX

Figure A1: The share of Top Five Countries in Each Province (2011-2022)



Source: Republic of Türkiye Ministry of Culture and Tourism, 2022.