Can Tourism to Spain Recover Fully?

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Abstract.

This article discusses the role of tourist sector for Spain, the influence of pandemic as a shock for this sector and possibility of full recovery. Spain has high economic dependence on tourism, which is partly seasonal, because it uses its geographical advantage of warm sea. Before the covid19 crisis, the volume of tourist arrivals to Spain resulted in almost 300 million nights spent, being the 1st in EU. Spanish tourism was relatively cheap, and this was one of the reasons for its advantage in number of visitors in comparison to Italy and France. During the first year with covid pandemic measures touristic flows dropped a lot (in Catalonia by above 68%), while in 2021 the recovery was incomplete. The recovery in 2022 is almost complete in nominal revenue, but given inflation is not complete. It is important to consider hysteresis: not all tourists from EU, who were forced not to travel or travel domestically in 2020-21, would return to Spain. The covid shock on lower income group (which formed substantial part of tourist flow to Spain) by inflation and rising unemployment is also important to consider. The article also contains models. The first one studies individual preferences for tourism as well as aggregate demand coming from different income groups. The second model analyses the change of destinations in favour of domestic under covid pandemic restrictions. The third model studies possible equilibria between demand and supply curves and their application to post-covid world of tourism. Suggestions for improvement of Spanish tourist sector are also given.

JEL Classification*: D11, D21, D80, E71, L89, Z30.*

Keywords*: tourism, Spain, covid19, microeconomics.*

1. Introduction

Tourist sector became increasingly important for the global economy in the last two decades. It is also quite important for Spain. But the recent covid pandemic has created an enormous shock for it. This paper intends to answer the question whether Spain can fully recover from this shock in the coming years. For this purpose, it is important to combine some evidence about tourist sector in Spain, its development and special features, and then to suggest microeconomic models that can help us to track the changes and predict possibility for recovery. Hence, this paper contains both descriptive and analytical parts.

This paper considers the dynamics of tourist sector in Spain in 2020-2022 and the forecast for the future. It contains not only the facts about Spain, but general global trends in tourism caused by pandemic. There are also simple models about consumer demand for tourism and how it has been affected by travel restrictions caused by covid19 pandemic. This paper is both descriptive and theoretical. Global tourism, like Spanish, is under huge shock after covid pandemic restriction period. Both demand and supply of touristic services are under huge changes caused by restrictions and uncertainty. That is why it is important to understand microeconomic behaviour of tourists, its change during pandemic and after it, and to make aggregation, looking for possible new equilibria.

While only 2 years have passed since the beginning of pandemic, there are already not only many articles about it, but also the whole book, edited by Demir, Dalgic and Ergen (2021). Tourism has a significant contribution to the global economy, being the largest branch of service trade. According to The United Nations World Tourism Organisation (UNWTO), there were 1.4 billion international tourist arrivals in 2018 (up 5% from the same time in 2017), with a total spending of $1.7 trillion (up 4% from the same period 2017) (UNWTO, 2019). Moreover, the tourism sector accounted for 7% of total world trade in 2019. It is the world's third largest export sector after fuels and chemicals.

The tourist sector has been steadily developing over the last decades. It has satisfied the consumer demand for variety of locations and of activities to spend their holidays. In some countries it has formed a substantial fraction of GDP and thus was quite important for overall economy. Tourism is the 3rd largest socio-economic activity in EU, and EU as a whole is number one touristic destination in the world. It attracts tourists for different activities, including cultural visits to cities, beach holidays and enjoying nature.

Europe is the number one tourist destination in the world. In 2018 European Union (EU) received 50.7% of global tourist arrivals with the value of USD 570 billion, and this contributes significantly to the EU's gross national product and employment. In 2018, Spain has received 82.8 million (11.7%) of global tourist arrivals and 12.9% $73.8 billion (12.9%) of global tourist revenues (UNWTO,2019).

Tourism can be fully understood only by adopting a multi-disciplinary approach. The sector contains a number of subsectors including hospitality, leisure, entertainment, recreation, aerospace and other activities. These subsectors in turn, include cultural, medical and ecological sectors. All tourism subsectors form a set of interconnected players such as travel and transportation agencies, accommodation entities, restaurants, private tours, public actors and associations that form a multifaceted system. The behaviour of the overall tourism structure essentially depends on interaction between its parts. (Elhini M.M., Kafafy D., 2021)

The covid19 pandemic, which started in February 2020, exerted an unprecedented shock on both the supply and demand sides of the tourism sector. As of early 2020, COVID-19 has paralyzed the hospitality industry, leaving devastating effects on economies that depend heavily on tourism. The outbreak has led to the cancellation of trade fairs, congresses, and cultural events in Europe. EU tourism industry, which employs about 13 million people, has been estimated to lose around € 1 billion a month in revenue due to the pandemic. (Gorkemli Kazar, Altug Kazar & Tuba Akpinar, 2021). Furthermore, the World Travel and Tourism Council (WTTC) has estimated that around 75 million people worldwide and 6.4 million in the EU will be unemployed in the travel and tourism sector in 2020.

The paper is organized as follows. Section 2 presents some facts about Spain. Section 3 presents some facts about tourism to Spain. Section 4 presents the models of individual demand for tourism, its modification during the covid19 pandemic and the aggregate model for an equilibrium between demand and supply. Section 5 is about future forecast and policy suggestions. Section 6 concludes.

2. Changes in Tourism to Spain during 2019-2022

Spain is the top destination for tourism, if one looks at such measure as nights spent in hotels. This measure does not give an idea about overall revenue, because the spectrum of

tourist spending differs across countries. As for Spain, it is characterized by high fraction of beach holidays in the overall touristic flow. It is also characterized by moderate prices, being in the group of touristic countries together with Greece and Turkey, but cheaper on average than beach destinations in France and Italy.

The tourism sector accounts for around 15 percent of the Spanish GDP, and thus it is a very important economic sector. Since covid19 pandemic counter measures was a great shock for global tourism, it is possible to consider the pre-pandemic year 2019 as a benchmark.

In 2019, nearly half of all overnight stays of international tourists in the EU were in Spain, Italy and France. Spain was the most popular EU destination for international tourists, with 299 million nights spent in tourist accommodation, or 22 % of the EU total. The next was Italy, with 220 million nights, followed by France, with 136 million nights. 65 % of EU residents made at least one personal tourism trip in 2019[2]. Note that 126 million tourists have arrived to Spain in 2019[3].

Let us look at the changing pattern of touristic destinations in 2020, the 1st year of pandemic. The COVID-19 pandemic impacted more heavily on regions depending on international tourists, compared with regions that were favoured by domestic tourists. As we can see from Fig.1, coastal regions of Mediterranean Sea (that had high fraction of international tourism) suffered more. Due to cross-country restriction in mobility caused by pandemic, more tourists preferred domestic destinations. As for Spain, we see a very high drop of tourism to Catalonia in 2020 (by more than 68%), while other Mediterranean coastal areas in Spain (excluding Baleares) had a lower drop (between 56 % and 68 %).

In 2020, there were 1.42 billion nights spent in all forms of tourist accommodation across the EU. In 2021, the number of nights spent at EU tourist accommodation establishments totalled 1.8 billion, up by 27% compared with 2020, but down by 37% compared with 2019[4]. In 2022, recovery of tourism in EU was even higher. In June 2022, tourists spent 68% more nights comparing with 2021. In the first six months of 2022: nights spent in EU tourist accommodation reached 86% of the pre-pandemic level[5].

Fig. 2 shows the dynamics of revenues from tourism in Spain during the last 5 years. They are seasonal, with maximum in summer due to coastal tourism. As we can see, the peak in 2022 shows almost full recovery from 2019 (in nominal values, but inflation in 2022 was very high). However, the drop of summer peak in 2020 was about 80%, while in 2021 – about 50%. As we can see from Fig.2, in quiet years - 2018 and 2019 – the ratio of annual maximum to its minimum was approximately 2. This means that about one half of tourists are seasonal, and travel there also to enjoy sea and beach.

The dynamics in the previous years (1998-2018) show both a positive trend and seasonality (see Fig. A1). We observe peaks approximately in July-August each year, and minimum in December- January. This suggests that the major fraction of touristic revenues in Spain comes

[2] Source: https://ec.europa.eu/eurostat/statistics-explained
[3] Source: https://data.worldbank.org/indicator/ST.INT.ARVL?locations=EU
[4] Source: https://ec.europa.eu/eurostat/web/products-eurostat-news/-/ddn-20220314-2
[5] Source: https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Tourism_statistics_-_nights_spent_at_tourist_accommodation_establishments&stable=1

in summer season and is related to beach holidays for families, when water is warm and schoolchildren have vacations.
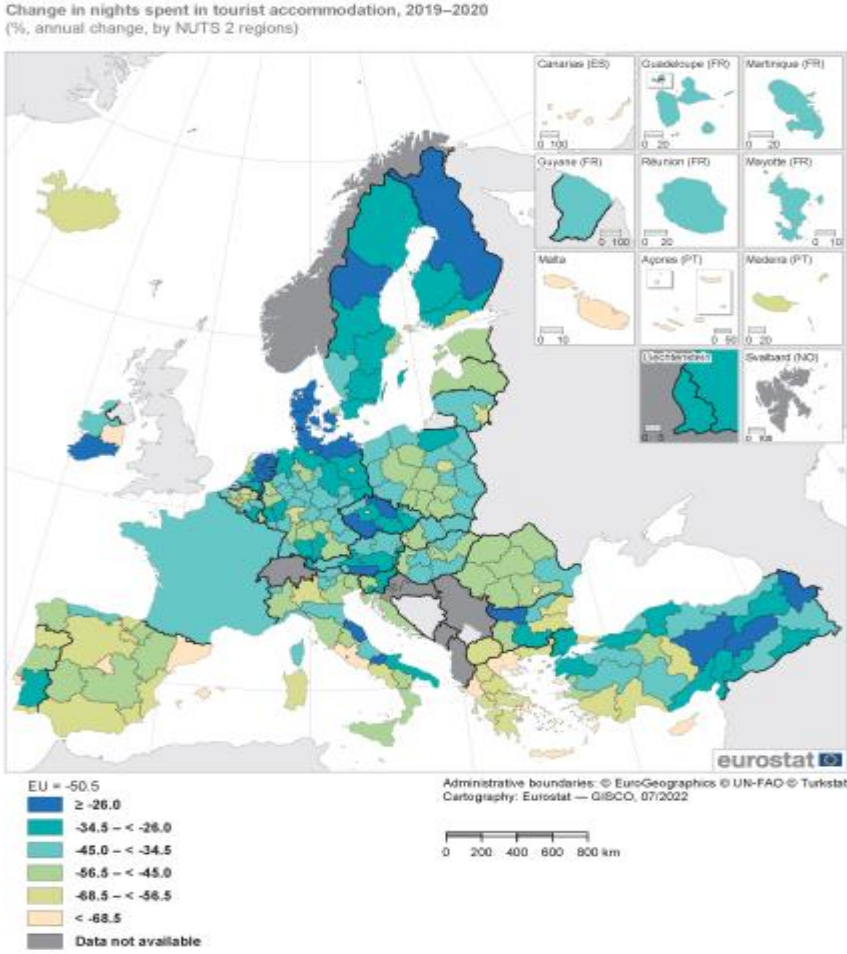
Fig. 1. Reduction of tourisms in EU NUTS2 regions between 2019 and 2020. *Source*: https://ec.europa.eu/eurostat/statistics-explained

Fig. 2. Graph of Spanish Tourism Revenues during 2018-2022 (in Mio Euro). Source: https://tradingeconomics.com/spain/tourism-revenues

3. Facts about Tourism to Spain

3.1. Seasonality

As we can see from Fig.2, in quiet years - 2018 and 2019 – the ratio of annual maximum to its minimum was approximately 2. This means that about one half of tourists are seasonal, and they travelled to Spain also to enjoy sea and beach. The rest of tourism is homogeneous across seasons, and their reason for tourism is more cultural.

The difference in sea temperatures in Mediterranean and Baltic seas is the key explanator of beach tourism to Spain. Fig. A2 shows sea temperature in Barcelona, Fig. A3 in Germany, while Fig. A4 is a map of Europe with sea temperatures.

3.2. Flow of Tourists, by Origin and Destination

Spain is an established tourism market, not only in Europe – the region with the most tourist arrivals worldwide – but also globally. During most of the 2010s, Spain registered more than 100 million international visitors each year, until reaching the record mark of 126.2 in 2019. That latter figure represented more than 2.5 times Spain's total population, which in that year added up to 47.4 million people. Tourism is, therefore, one of the major drivers of the Spanish economy. Between 2010 and 2019, the gross value added (GVA) of industries related to tourist accommodation and food services in the country grew by 24 percent to reach over 70 billion euros in 2019[6].

In 2019, the flow of tourists arrived to Spain from abroad grew by 1.1%, while spending rose by 2.8% to 92.28 billion euros[7]. According to National Statistics Institute of Spain, in 2019, the main emitting markets were the United Kingdom (18. 4 million), Germany (11.2 million) and France (11.1 million). These three largest sources of tourism to Spain form about one third of foreign tourists, but are already satiated (with the decline of about 1-2% from 2018 to 2019). In 2019, the highest growth of tourism was from new emitting markets – the USA (by 12.6 %) and Russia (by 6.9%).

Among internal destination in Spain, Catalonia was the most visited region, with almost 19.4 million tourists, followed by the Balearic Islands, with almost 13.7 million tourists and the Canary Islands, with more than 13.1 million tourists. Again, those three destinations form about one third of tourism to Spain. Beach vacations is possible in all of them, either for 4-6 months, or for the whole year (Canarias).

3.3. Changes in 2020-2022

After Spain experienced an annual drop of over 70 percent in the number of international tourists and excursionists in 2020, this figure went up by more than 40 percent in the following year. In comparison with 2020, the 36.5 million foreign visitors recorded in 2021 represented a decline of roughly 30 percent. France and Germany were the main countries of origin for international tourism in Spain in 2021, with more than 11 million travellers from these two European countries headed West for a trip to Spain. Meanwhile, the United Kingdom ranked in

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[6] Source: A. Lopez https://www.statista.com/topics/3867/travel-and-tourism-in-spain/#topicHeader__wrapper
[7] Source: https://www.lamoncloa.gob.es/lang/en/gobierno/news/Paginas/2020/20200203frontur-egatur.aspx

third place that year, accounting for only around 4.3 million foreign visitors to Spanish territory[8].

France was the leading source country for inbound tourism in Spain in 2020. Although British tourists in Spain have traditionally been the largest visitor group in the Mediterranean country, the number of travellers from Britain declined by almost 15 million in 2020, most likely due to difficulties created as a result of the COVID-19 pandemic. Notably, the share of domestic tourist expenditure was higher than the share of international tourist expenditure in the country in 2020, which was different from the share of tourism expenditure in Spain prior to COVID-19[9].

The impressive performance of the tourism sector in Spain also meant a dramatic collapse when the coronavirus (COVID-19) pandemic arrived. At the onset of the global crisis, international inbound tourism in the Spanish territory came to a halt for two months, and it remained significantly below pre-pandemic levels throughout 2020 and 2021. For instance, in August of 2020 – which is usually the most active month for tourism in the country – Spain lost nearly 10.8 million international visitors versus August of 2019. By the same month of 2021, the difference was still at 7.6 million tourists. If we consider the domestic trips taken by Spanish residents, they went down strikingly in 2020 and despite the recovery in 2021, remained over 25 % below the level of 2019[10].

4. The Modelling of Individual and Aggregate Tourism

This theoretical section contains three small models. First is about individual preferences for tourism, second – decision making under risk and third about aggregate demand and supply.

4.1. Individual Preferences for Tourism

The aggregate demand for tourism is composed from individual demands, which depend both on income and preferences. One touristic trip is a combination of spending of leisure (L) and consumption (C). Typically, either leisure becomes binding (for a richer person) or spending becomes binding (for a poorer person). This is the consequence of an assumption of little dependence of leisure endowment on income, due to legal regulation of vacations duration in EU[11].

The utility from one trip with duration T (days) comes from enjoying touristic consumption (beach, food, landscapes) and is less than proportional to T, because of decreasing returns (or satiation). The costs for a trip include fixed cost (transportation to destination, usually by air) and variable cost (hotel and food), which is proportional to duration. In this case the ratio of utility to cost has an internal maximum, and thus there exists some optimal duration of one trip.

Consider a simple derivation of consumer demand for tourism based on stylized facts, with the focus for beach tourism (important for Spain). Leisure endowment is regulated by EU labour laws and typically in about 4-5 weeks per year, which can be decomposed into several trips with duration of 1-2 weeks.

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[8] Source: https://www.statista.com/statistics/446278/annual-foreign-visitors-to-spain/
[9] Source: https://www.statista.com/statistics/640440/travel-tourism-total-gdp-contribution-spain/
[10] Source: A.Lopez https://www.statista.com/topics/3867/travel-and-tourism-in-spain
[11] In fact, unemployed have even higher leisure endowment but lower income comparing to those who work.

For an individual planning of trip, it can result in almost equal spending on transport, hotel and food. This corresponds to rational behaviour of a tourist who enjoys food, beach and sightseeing with decreasing returns, faces fixed transport cost of a flight and hotel stay proportional to trip duration. This can be modelled by such utility function of Cobb-Douglas type

$$U = Tr^a H^b F^{1-a-b} \ , \tag{1}$$

where 0<a<1, 0<b<1, Tr denotes transport cost, H - spending on hotel and F- spending on food. As we know from microeconomic literature[12], the optimal fractions spent on different inputs (Tr, H and F) are proportional to parameters of corresponding powers (a, b, 1-a-b).

For different consumers parameters a, b can vary, but they are typically close to 1/3. In this case, when a consumer has leisure endowment for 1 trip of 1 week[13] and expenditure limit of, let say, 1000 euro, she would like to spend about 330 euro on each factor: transportation, hotel and food. Since transcontinental flights are typically more expensive, it is reasonable to travel there for a longer period (for a person with not high income) or to spend time in more luxury conditions (for a person with higher income). A 2000-euro trip to other continent may include the flight for 670 euro, while a hotel can be 3-star (if it lasts for 2 weeks), or 4-5 stars (if it lasts for 1 week). Obviously, it is stupid to eat in McDonalds (except for burger lovers) to save on food, while living in a 5-star hotel.

There exist different touristic goods (packages) which differ in duration and price. For example, before covid pandemic a typical good was a one-week trip on a coast, including flight, hotel and food. Depending on quality, its price was ranging mostly between 500 and 1000 euro per person. The cheap package for 500 euro (with "all included") is one of typical touristic goods in Spain. This tourism is oriented on the segment of people with less than average income in richer (and colder) European countries (like Germany and Britain) and on middle income group in poorer countries (like Eastern Europe). A smart package would include cost components in fractions that are proportional to individual preferences. In other words, food in a hotel should correspond to its price, while more expensive hotels should be marketed for overseas tourists (willing to pay more per day given high cost of flight).

There also exist tourist segment for richer tourists, but competition across countries is higher and Spain does not hold a dominant position in this this segment, losing to France and Italy.

4.2. Aggregated Properties of Demand for Tourism

Tourist demand depends on income. Tourism is classified as a luxury good, and thus it is very small for low income, but then grows fast with income and reaches satiation in duration (due to binding leisure), but expands in consumption with further income growth.

According to German statistics[14], between 2009 and 2019 median equalized income in Germany grew from 18686 to 23515 Euro per year. In 2020, the mean income was 26105 euro, and inequality (measured as S80/S20, or the ratio between the total income of the top fifth and that of the bottom fifth of the income distribution) was 4.9 (slightly growing from 4.5 in 2009).

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[12] See, for example, Alpha Chang „Fundamental Methods of Mathematical Economics" and Hal Varian "Intermediate Microeconomics".

[13] One week duration is caused by a possibility of divided holiday schedule plus use of weekends.

[14] Source: https://www.destatis.de/EN/Themes/Society-Environment/Income-Consumption-Living-Conditions/Living-Conditions-Risk-Poverty/Tables/income-distribution-silc.html

Fig.A5 shows income distribution among German households, who generate a substantial part of tourism to Spain. We see that the lower peak of family income is between 1500 and 2000 euro per month. The quantity of families with income above 5000 euro is also substantial, and they form the group of tourism for rich. However, here we have competition of Spain with luxury destinations not only in Europe, but also worldwide, including Thailand, Indonesia, Caribbean and luxury islands in the Indian ocean (which have warm sea during more months).

There is substantial literature about choice of destinations by tourists. There is general agreement that tourism is luxury good and demand for it grows with income more than proportionally. Part of research is based on surveys. For example, Djeri et al (2014) made a survey in Vojvodina (Serbian province) in 2010 among the users of travel agencies. Among their respondents 80% had high and very high income, and only 8.7% low. Given than rich in Serbian population form a minority and assuming representative selection of respondents, this fact already shows that for equal quantity of poorer and richer people, the latter form a higher fraction in tourist flow, at least in countries with lower average income. They found that respondents with very high incomes travel once or twice a year, mainly to the seaside and mountains, with medium income only once a year, and with low incomes travel rarely and mainly in post-season because of lower prices.

Let f(w) denotes income distribution in a particular source country for tourism, while D(w) is the demand for tourism to a certain destination (here Spain), measured as a product of average trip cost and a fraction of people in certain income bracket that demand this destination. Then overall demand (to travel from country A to Spain for a beach holidays) is the integral of this product:

$$Y = \int f(w)D(w)dw. \tag{2}$$

Then we can consider the sum of such demands from different source countries, to obtain an aggregate demand for such tourism to Spain (or other destination country).

The covid pandemic had a huge impact, changing both functions, f(w) and D(w). The change in D(w) was temporal, only during pandemic restrictions on mobility.

4.3. The Role of Risk during Pandemic

Pandemic has created many risks due to covid travel restriction. In particular, the whole trip to another country was under risk of not passing covid test (on dividual level) and closing this country as tourist destination.

Suppose that a consumer is facing a discrete choice of two tourist goods: domestic travel to countryside (D) and foreign travel (F). There exists some probability 0<P<1 to fail the foreign trip due to covid restriction. Consider a risk neutral agent with a discrete choice between two options for travel with equal price C: domestic D and foreign F. Suppose that domestic trip gives a lower utility level than foreign: U(D) < U(F). There might be several reasons for that: a) decreasing returns to utility from domestic trip, because all places have been already visited, b) warmer sea abroad, like in the choice between Germany (or UK) and Spain.

Given that the cost of those trips is equal, but the utility of foreign trip is higher, we have a threshold probability P*, so that expected utilities are equal:

$$(1 - P^*)\, U(F) = U(D). \tag{3}$$

If the probability P to fail the trip (due to restrictions on the border) is exactly P*, a risk neutral agent will be indifferent between those domestic and foreign trips. If the probability of failure is lower (P<P*), then the expected utility abroad is higher, and this risk neutral agent will choose a risky travel abroad. In the opposite case (P>P*), she will prefer a domestic trip.

It is possible to include heterogeneities: a) in preferences (P* varies for different agents) and b) in risk aversion. Clearly, ratio of utilities U(D)/U(F) can vary across individuals. That is why a fraction of agents, choosing domestic trip will grow with risk P. Since many agents are risk averse, this adverse effect will be higher. The higher is parameter P, the higher fraction of potential tourists will choose domestic travel instead of foreign travel. This is exactly what has been observed in Europe during covid19 pandemic.

Consider a behaviour of, let say, German tourist. The fraction interested in beach holidays, prefer Mediterranean countries to Baltic Sea because the weather is warmer. Budget tourists prefer Spain in particular due to cheaper offers comparing to Italy or France (but might be indifferent between Spain, on one hand, and Greece, Croatia and Turkey, on the other).

4.4. Aggregate Demand and Supply Model

Since the aggregate demand for tourism is formed by heterogeneous income groups it is useful to consider stylized demand curve as a superposition of demand of richer and poorer tourists. Fig. 3 shows such demand curve with a kink (under formal assumption of just 2 incomes). The supply curve is derived on the basis of zero profit condition, assuming fixed cost F and variable cost V. Then the average cost, AC, depends on the number of tourists N:

$$AC = V + \frac{F}{N}. \qquad (4)$$

Consider a small private firm operating in a touristic cluster. It takes its costs and the flow of tourists as given and tries to set a price that will maximize its profit. Depending on its parameters F and V, some firms may never reach profitability (S1), while others can operate only with high prices, accessible only for rich tourists.

If the demand is shifted upwards, there might be more equilibria on the segment with poorer tourists. During covid19 season, many hotels were facing demand drop, and either could not recover their costs (case S1) or could operate only for richer tourists. The formal equilibrium conditions are derived below.

Consider the case of linear demand (segments on Fig.3 are linear) *P=A-BQ* and zero-profit supply curve *C=F+V/Q*. Then the profit function of a hotel is given by:

$$\pi = [P(Q) - C(Q)]Q = AQ - BQ^2 - FQ - V. \qquad (5)$$

The first order condition from profit maximization with respect to quantity (*A-2BQ-F=0*) gives the optimal pricing policy and the corresponding quantity:

$$P^* = \frac{A + F}{2} , \qquad Q^* = \frac{A - F}{2B} . \qquad (6)$$

Note that with a kink demand curve (like on Fig.3) we have different parameters A and B for different parts of the curve. Its left part (demand of rich) is characterized by higher A and B comparing to its right part. That is why the solution of a hotel oriented on rich will give higher price and lower quantity than for poor. The same is also true for air companies. If it is oriented at demand of rich, few tickets are sold at high prices: this may be good for profit, but gives low

social utility, cutting many poorer consumers from the market. Now there are many budget air companies in Europe that operate with low prices, resulting in high volumes. Fig. 5 shows both possible cases.
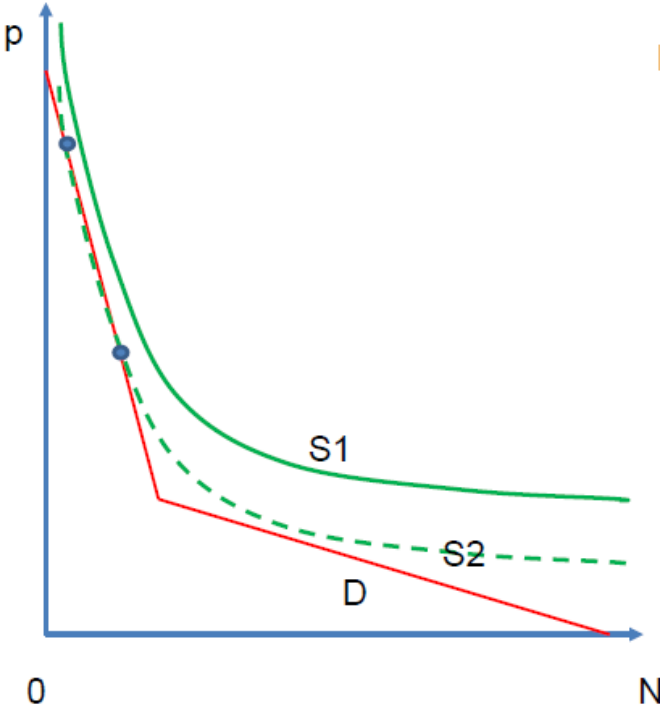

Fig. 3. Demand curve D with two income groups of tourists and supply curves S1, S2.

It is also important to study the interval of company profitability. Profit function (5) is quadratic in Q. It is positive when the discriminant of this equation is positive; this happens iff
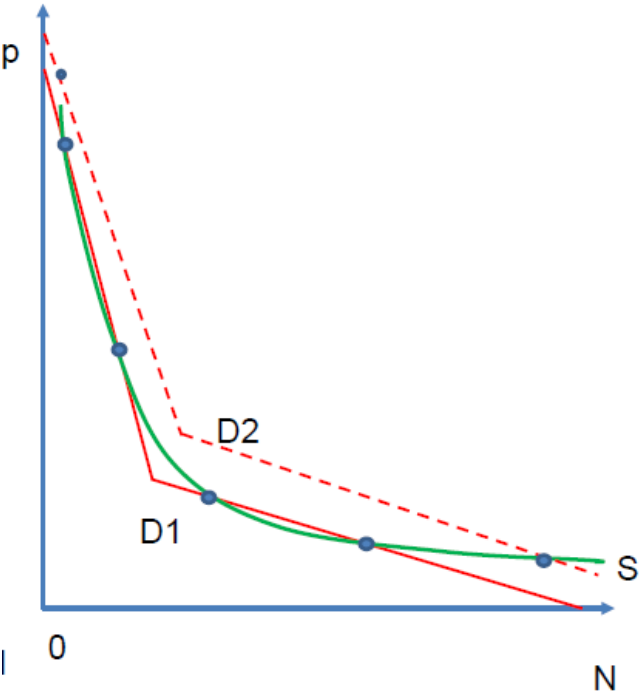
$$(A - F)^2 < 4BV. \tag{7}$$

Fig. 4. Demand can shift between D1 and D2. In both cases we have possible equilibria with low and high prices.

It might happen that the condition (7) is valid only for the left part of the curve (see Fig.3), but it is also possible to have 2 areas of intersections between zero-profit supply (*S*) and demand (*D*) curves (see Fig.4).

Note that during the pandemic some hotels were not increasing, but decreasing their prices, trying to catch some volume of tourists (which dropped their demand due to additional costs of tests and emerging risk). By the end of 2022 the pandemic is mostly over, but due to high inflation (above 10% in EU in 2022) the demand of tourists for travel is still lower than in 2019.

4.5. Summary of Theoretical Results
1. Individual preferences of a tourist include optimal composition of such cost components as transport, hotel and food, the sum of which should be minimized for obtaining a certain level of utility from tourist services. This calls for optimal composition of costs in tourist package, suggesting a higher utility level for given price in comparison with what she can purchase separately in own trip design.
2. Aggregate demand for tourism in certain country comes from sum of individual demands which depend on income and preferences across destinations.
3. During the pandemic trips became risky (especially abroad) and some international tourism was substituted by domestic. In the case of beach tourism from Northern Europe to Spain tourists had a trade-off between lower utility from cold sea and less risk of rip cancellation when they were not crossing a border between countries.
4. The aggregate demand for tourism has dropped after pandemic and became more sensitive to prices, especially in budget tourism. Since supply of tourism is subject to scale economies while its cost went up, this causes a shift to new price equilibria.

5. Future Forecast and Policy Suggestions
At the moment, nominal revenue from tourism to Spain have almost recovered. Given substantial inflation between 2019 and 2022 (especially in 2022), the recovery is not yet complete.

From summer to the end of year 2022 we do not observe closure of entry to Spain due to covid19 restrictions. However, more factors have to be taken into account. The first factor is inflation, which made income lower in absolute terms. This negatively influence tourism, especially for people with average income and below. The second factor is linked to the war in Ukraine and sanctions over Russia. Note that tourists from Russia and Ukraine formed an important fraction of tourism to Spain. The third factor is negative experience and memory. Those people who once have substituted foreign tourism to domestic might not fully return to the previous touristic pattern. The fourth factor is higher price for energy in 2021-22 comparing to 2019. It results for higher cost to offer services, especially transportation.

All those factors suggest that recovery of tourism to Spain might not be complete, but stabilize at 80-90% (at best) from per-covid values. Further development depends on innovations in Spanish tourism and competition with other touristic destinations.

5.1. Policy Suggestions
Under those conditions, Spanish tourist sector has to adapt by declining its costs to attract higher volume of tourists. In the past it was specializing more on budget tourism (giving away

richer tourists to France and Italy), and has to recover this fraction. Part of those tourists have less possibility to maintain pre-covid demand, because inflation in EU was above income growth in 2022. It might be optimal to develop cluster tourism, where more places of interests are in close locations, so that travel costs can be minimized. This is also ecologically friendly approach causing a decline in carbon emissions.

6. Conclusions

Tourist sector is quite important for Spanish economy. Using its comparative geographical advantage in access to warm Mediterranean Sea, Spain has created very high flow of foreign tourists by 2019. However, covid19 pandemic in 2020-2022 was a big shock for global tourism in general and Spanish in particular.

The paper studies the consequences of covid 19 pandemic for the performance of tourist industry in Spain. It contains both descriptive and theoretical parts.

In the descriptive part some stylized facts about global tourism, tourism to Spain and the changes in 2020-2022 are provided. In particular: a) tourism is an important part of Spanish GDP, b) its volume was growing in the post-crisis period 2010-2019 and resulted in Spain having the highest number of foreign tourists in 2019, c) covid pandemic was a high shock for Spain and especially for Catalonia, it was higher in 2020 than in 2021, while there was almost full recovery in 2022.

The theoretical part contains several sections, that study the following issues: a) individual decision for travel by rational agent, b) aggregation of travel demand from different income group, c) individual behaviour in risky environment caused by pandemic restrictions, d) derivation of aggregate demand for tourism and aggregate supply of tourist services based on highly stylized model, with an assumption of two income groups and scale economies.

It is suggested that recovery might be incomplete because of decline in real incomes of tourists caused by high inflation in 2022, due to higher costs of energy and habit change (reorientation of a fraction of tourists for domestic destinations caused by covid experience). In this environment Spain can react by cost reduction, for example, by development of cluster tourism, with many places of attraction close to each other.

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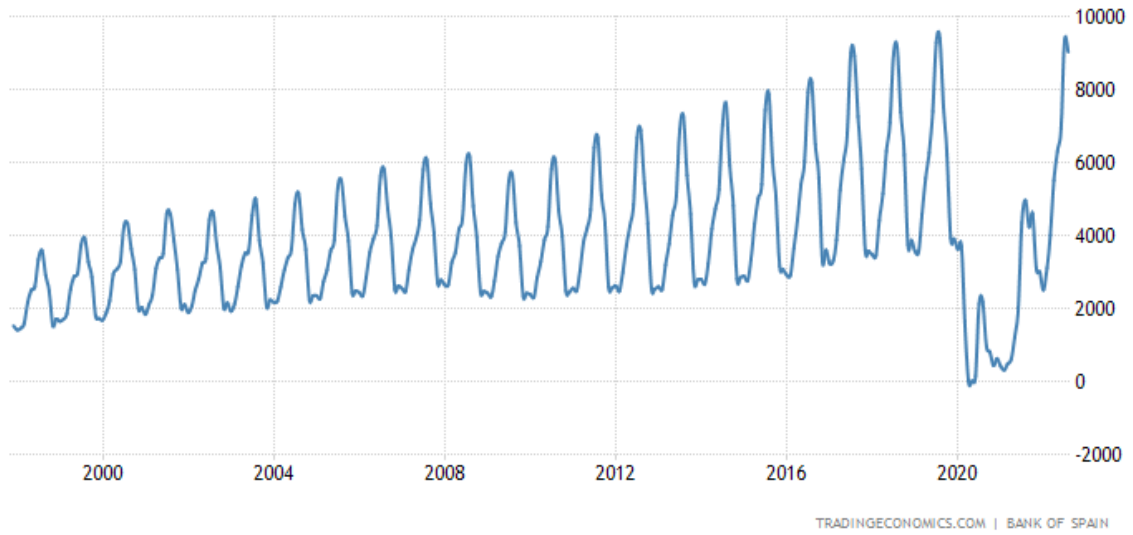
Appendix (additional Figures)

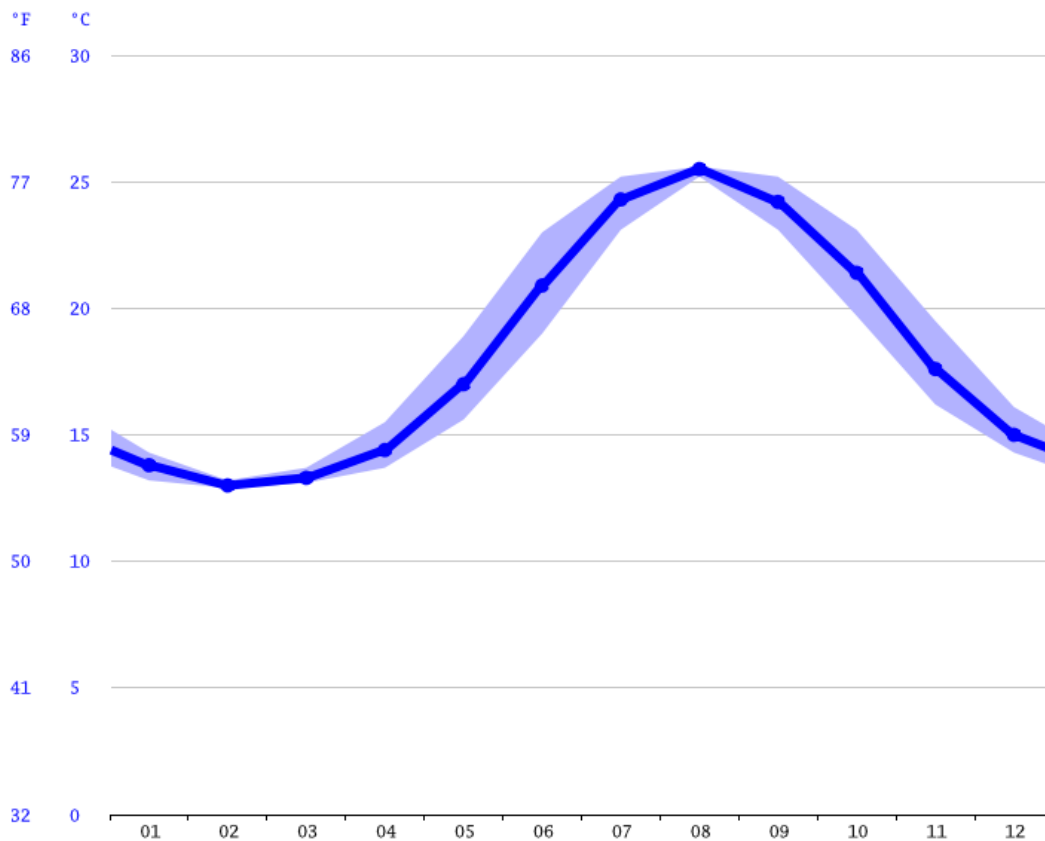**Fig. A1.** Positive trend and seasonality in Spanish touristic sector. Source:
https://tradingeconomics.com/spain/tourism-revenues

Fig. A2. Barcelona average sea temperature. It is above 20 degrees C in June-October.
Source: https://en.climate-data.org/europe/spain/catalonia/barcelona-1564/#climate-graph

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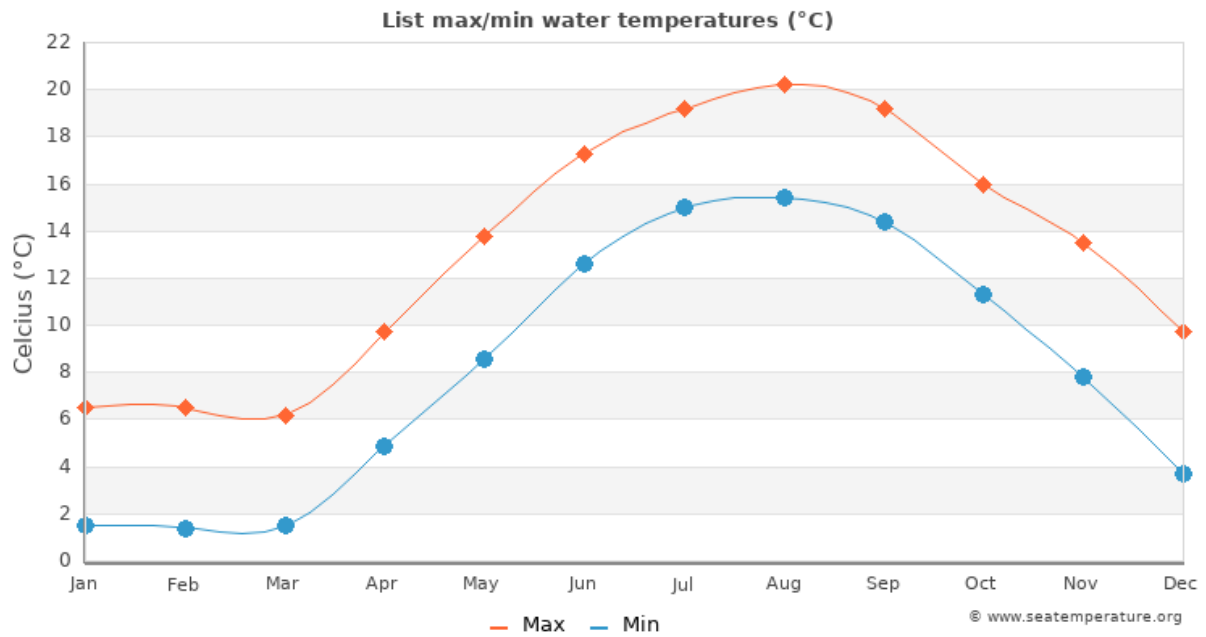
Fig. A3. Annual variation of sea temperature in Germany, Schleswig-Holstein. Source: https://www.seatemperature.org/europe/germany/list.htm
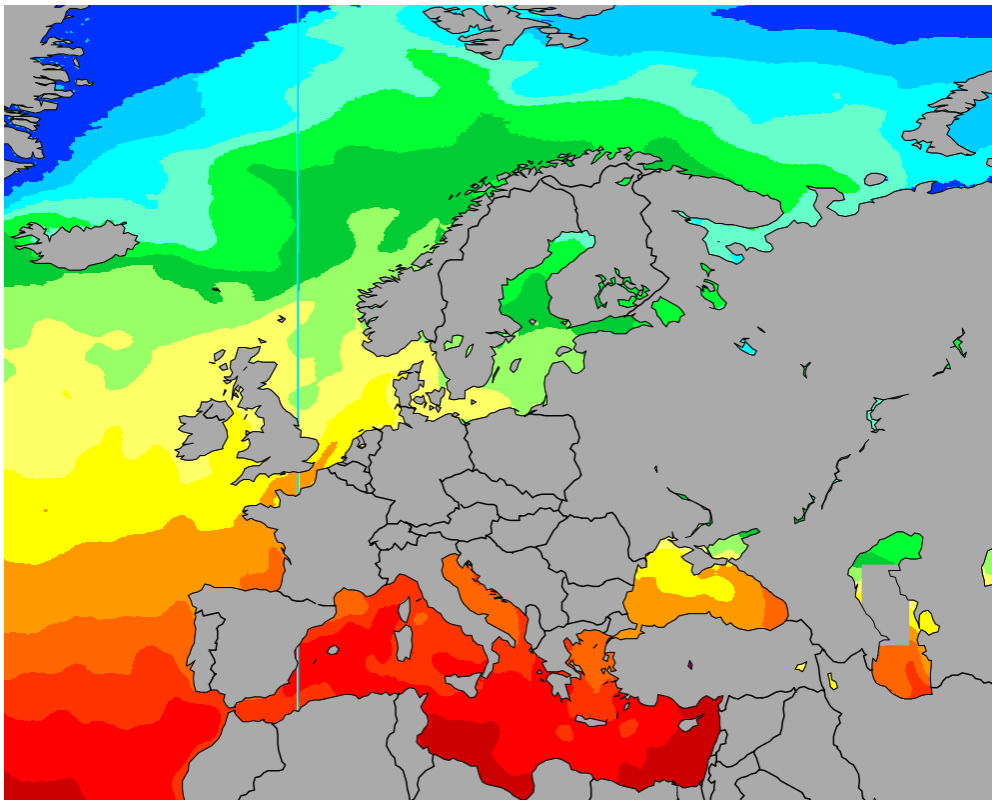

Fig. A4. Map of European sea temperatures. Mediterranean Sea in warmer than Atlantic at the same latitude, while North Sea and Baltic Sea are much less warm. *Source*: https://www.seatemperature.org/public/europe.png (uploaded on 12 Dec.2022)
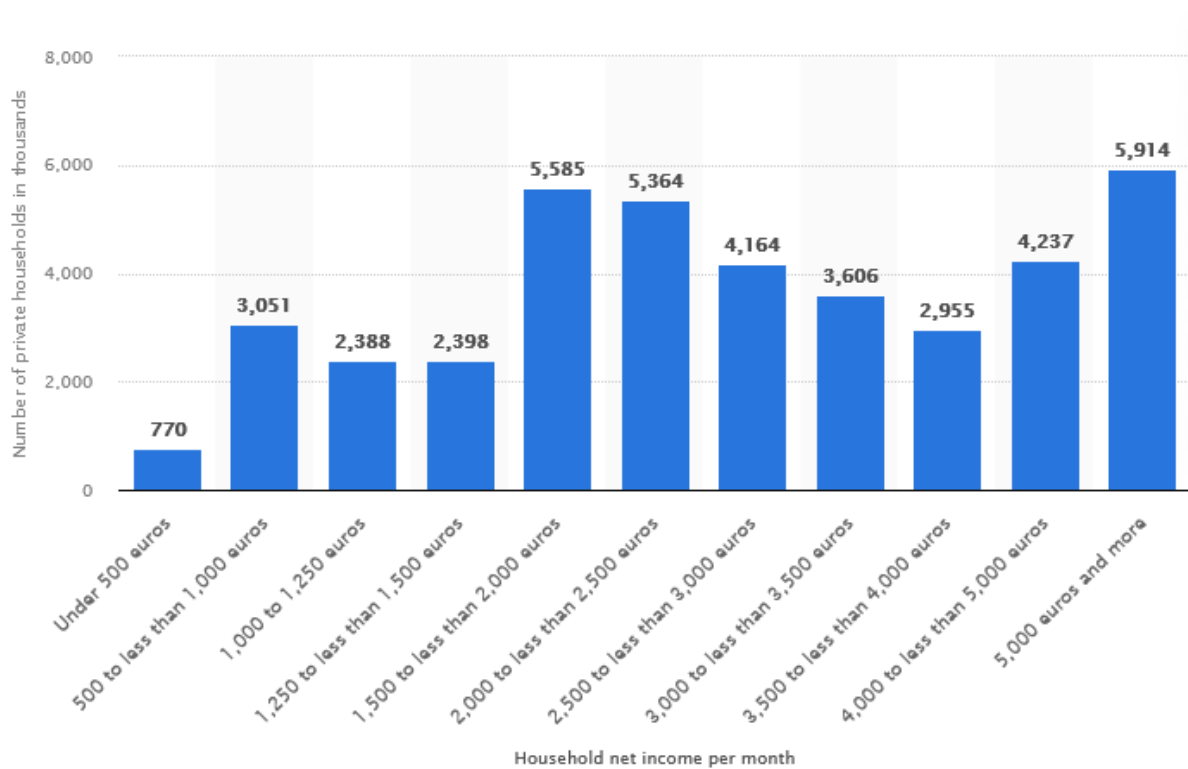
Fig. A5. Income distribution for Households in Germany in 2021 (monthly data in Euro).
Source: https://www.statista.com/statistics/750827/private-household-income-distribution-in-germany/