Chapter 25
Climate Change Implications in Aviation and Tourism Market Equilibrium

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Abstract A significant proportion of capacity within the European air transport system is taken up by demand for leisure flying and it is particularly associated with summer holidays. Forecasts suggest that climate change has the potential to have a major impact upon levels and patterns of demand for leisure flying as seasons change, as some traditional locations become less attractive and as new markets emerge, either at different times of the year or in new geographical regions. This paper deals with the key challenges and issues for the aviation and tourism sectors towards a climate change adaptation strategy for attractive tourist destinations. Through a top-down analysis, the variables of climate change that impact on the supply and demand equilibrium for tourism and aviation are defined, and based on a gap analysis framework, the relationship of these variables to the aviation and tourism equilibrium is given. Conventional wisdom is to provide key messages to aviation authorities, decision makers and stakeholders regarding the expected changes in demand, the implications in airport operation and the effects in regional economic development, especially, for regions that are highly reliant upon income from tourism. The application includes the aviation and tourism in Greece, which is a very attractive tourist destination in southeast Mediterranean, highlighting the diverse impacts of a changing climate on aviation and tourism, that expected to have significant implications for air traffic flows and the economies across Europe.

Keywords Climate Change • Implications • Aviation • Tourism • Aviation-Tourism equilibrium

Introduction

A significant proportion of capacity within the European air transport system is taken up by demand for leisure flying. This is particularly associated with holidays taken in the Mediterranean during the summer months and ski holidays taken in the

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Alps and other parts of central Europe during the winter. Forecasts suggest that Climate Change (CC) has the potential to have a major impact upon levels and patterns of demand for leisure flying as seasons change, as some traditional locations become less attractive and as new markets emerge, either at different times of the year or in new geographical regions. Such changes could have significant implications for the economies of a number of regions across Europe that are highly reliant upon income from tourism.

A comprehensive assessment of these relationships would require significant investment so with this in mind, the content of this paper is designed merely to illustrate the nature of the phenomenon. This will be achieved through a literature review and based on the gap analysis methodological approach, the CC implications for aviation and tourism businesses are presented to illustrate the nature, timing and potential magnitude of changes, and their potential impact upon demand. The application deals with tourism and aviation in Greece, which is selected, for two reasons: firstly, the Greek economy is heavily dependent on aviation and tourism; and secondly, given the recent long term economic recession of the country, the additional income from tourism and aviation growth is seen as a key element of Greece's economy recovery plan (IMF 2014).

The Greek economy is heavily dependent on aviation for tourism which accounts for 20 % of Greek GDP. Approximately 73 % of tourists arrive in Greece by air while 80 % of international arrivals are tourists (Dimitriou et al. 2011; Eurocontrol 2010). CC not only has the potential to have significant impacts on the pattern of demand, it also has consequences for the ability of some tourism locations to meet demand when and where it arises (for example as a result of water shortages). Through a systemic approach this paper maps the CC variables which impact the aviation and tourism supply–demand equilibrium. The broad findings of this paper deals with the break down and the review of the CC implications on aviation and tourism supply–demand equilibrium, providing the framework for other similar applications.

The paper is divided in five sections. The first includes a short introduction to the topic, highlighting the key objectives of the paper. This is followed by the section that provides an overview of tourism and aviation trends. The third section deals with the CC implications for supply and demand equilibrium of tourism and aviation, providing a systemic approach to define the CC variables relevant to the tourism-aviation equilibrium and a gap analysis to define the relationship of these variables. The next section provides the results of a weighted SWOT analysis for aviation and tourism development in Greece and explaining the need for CC adaptation and mitigation policies to be incorporated into tourism and aviation strategies designed to support sustainable development. In the last section the conclusions and the references are cited.

Tourism and Aviation

Tourism Industry Trends

Over the last half century, tourism experienced continued expansion and diversification, becoming one of the largest and dynamically developing sectors of external economic activities. In 2013, Travel & Tourism's total contribution was 9.5 % of the global GDP (approx. US $7 trillion), not only outpacing the wider economy, but also growing faster than other significant sectors such as financial and business services, transport and manufacturing (WTTC 2014).

In Europe, the International Tourist Arrivals (ITA) present virtually uninterrupted growth—from 277 million in 1980, 528 million in 1995, and 940 million in 2010, and this trend is forecast to continue reaching the level of 1.8 billion ITA in 2030 (UNWTO 2011). Europe (EU28) achieves 54.1 % share of the global tourism market and the travel and tourism sector makes an increasingly large contribution to the overall economy, contributing US$1,512 billion to the European GDP, which represents 9 % of the overall GDP and creating over 21 mio jobs, which represents 10 % of the overall employment in 2013 (WTTC 2014). The Mediterranean region is one of the most attractive tourism destinations in the world, accounting more than a third of ITA (424 million ITA in 2013, UNWTO 2014). Spain, Portugal, Greece, Cyprus, Croatia, Turkey and Egypt are the leaders in attracting tourists in region of Mediterranean and tourism in these countries is one of the major source of national income (UNWTO 2011).

Aviation Growth

Aviation is a key driver for tourism development, accommodating the higher shares of ITA (Forsyth 2006). Whilst geography has meant that, in modern times, air travel has always been the dominant mode for long distance travel and ITA, moves towards deregulation, and in particular the emergence of the low cost carrier sector, has also increased aviation's significance for short and medium haul tourism trips (Burghouwt and Hakfoort 2001).

Due to the aviation industry liberalization along with falling costs of supply chain, the demand for air transport has increased exponentially over the years. Worldwide the aviation industry in 2013 shared 53 % of ITA, while the remainder 47 % travelled by all other transport modes—whether by road (40 %), rail (2 %) or over water (5 %) (UNWTO 2014). The vast majority of ITA are leisure travelers and for remote destinations, aviation is the key driver of economic development. ATAG (2014) estimates that 3.1 billion passengers were transported by aviation in 2012, which globally supports 58.1 mio jobs and contributes US$2.4 trillion that is equal with the 3.4 % of global GDP.

Aviation could be defined as providing "connectivity" or "accessibility" to a global market. Improving connectivity leads to more productivity, which in turn attracts more investment. Connectivity is an effective engine for increasing both competitiveness and economic growth. That is particularly true in Europe, which relies on aviation to provide the international transport links that make Europe a global hub of social and economic connectivity. Following the liberalization of aviation market in Europe (EU28), the number of flights within the EU has more than doubled, the destinations served by more than two airlines have quadrupled and low-cost carriers have boomed during last decade and they now account for almost half of the intra-European aviation market. ATAG (2014) present data showing that the European aviation industry (EU 28) supports 9.3 million jobs and generate US$658 billion (512 billion €) income, contributing essential in EU GDP.

The Link Between Tourism and Aviation

Many researchers review the relationship of tourism and economic development. Dwyer et al. (2004) underline that tourism benefits include investments in infrastructure, the development of management expertise and cultural exchange benefits which affect various sectors of the regional economy. Kim et al. (2006) provide evidence that for the tourist attractive destinations economic stability and financial sustainability related to tourism business development, while, Lee and Chang (2008) highlight that the tourism industry contribution is essential to regional economic development; and Dimitriou et al. (2011) provide the methodology to estimate the impact on the economic system for the regions heavily depended on aviation.

The passenger's decision for choosing the most suitable holiday option depends on a variety of factors such as the consumer profile, the distance of the final destination, the transport options and the price of services. (Mohamad and Jamil 2012) present the complexity of the tourist consumer's decision process and they support that the transportation accessibility and level of service are correlated to tourism market trends. Forsyth (2006) underline that tourism remains heavily dependent upon the aviation industry and any changes in its efficiency can have a significant impact on tourism development. In terms of prices, Tretheway and Mark (2006) demonstrate that tourist demand influenced from the supply chain cost and revenue management.

Institutions, associations and governmental bodies widely recognize the need for monitoring tourism demand and adopting strategies to exploit the economic benefits of tourism. According to WTTC (2014) many islands in the Mediterranean draw a considerable part of their income from the tourism industry, which in turn, is heavily dependent on the aviation industry. Dimitriou et al. (2011) estimate the contribution of aviation in regional development providing evidence that this relationship needs to be investigated not only to extrapolate the demand trends,

but also to adopt policies, define strategies and support decisions towards tourism policies and investments in new infrastructure to accommodate additional demand.

CC Implications for Tourist Destinations

Different climatic changes may have a range of diverse impacts on aviation and tourism infrastructure and services. These may vary significant by region and depend on the local or regional circumstances and vulnerabilities, including those associated with the natural environment, as well as abroad range of socioeconomic factors (Dimitriou et al. 2011).

CC has the potential to have significant impacts on the pattern of demand for tourism and the ability of tourist destinations to supply their tourist product to international and domestic customers (Daley et al. 2008). According the concept of gap analysis, Fig. 25.1 illustrates how CC variables can impact on demand and supply side variables which produce the tourism equilibrium in tourist destinations (Eurocontrol 2010). The demand side consists primarily of mitigation and adaptation policies that will impact consumer choice (carbon pricing, climate change awareness and sensitivity). The orange middle arrows list ambient weather conditions (which are both demand and supply variables) in Northern and Southern Europe. Budgeting the CC implications could estimate the determinant of the tourism-aviation supply–demand equilibrium (Eurocontrol 2010; Thomas et al. 2010).

Aviation has become a major contributor to economic growth that requires operational productive and efficient infrastructures and services (Dimitriou et al. 2011). At the same time, CC is likely to have essential implication for aviation and tourism industry infrastructure (Daley et al. 2008). The need and the budget for

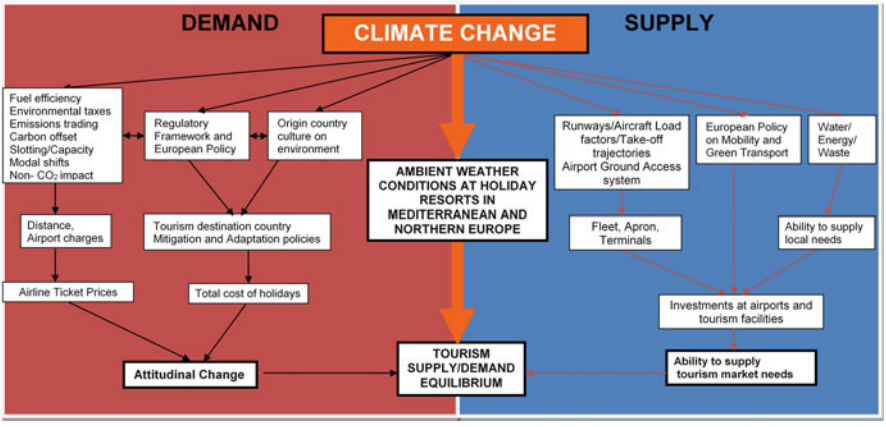

Fig. 25.1 Demand and supply variables for aviation-tourism equilibrium

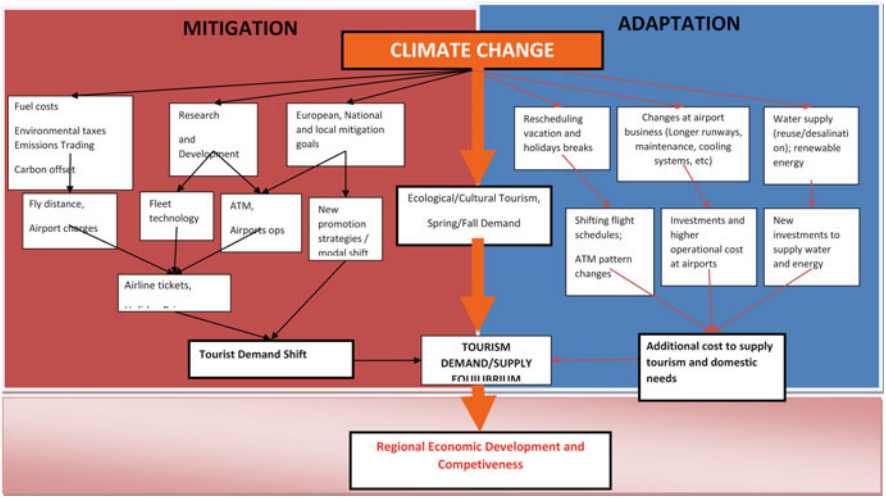

Fig. 25.2 CC mitigation and adaptation variables for aviation-tourism equilibrium

the inclusion of adaptation measures in the transport industry are highlighted by UNECE (2013). Dimitriou et al. (2014) review the CC adaptation strategies and environmental mitigation actions for 15 European airports, highlighting the low performance of Greece and South Europe.

Taking all these factors into account, a mitigation/adaptation chart (Fig. 25.2) is constructed to demonstrate that the supply/demand elements are two sides of the same coin (Eurocontrol 2010). This is because mitigation and adaptation will impact the supply/demand equilibrium differently in the short and long-run. The black arrows depict mitigation variables while the red arrows depict adaptation variables. The orange arrows list variables impacting both mitigation and adaptation. For example mitigation is pull factor, which could reduce tourism demand in the short-run because carbon pricing or control regulation will increase the cost of travel and cost of tourism facilities. However in the long-run, mitigation would help sustain European tourism if greenhouse gas concentrations were to be controlled so as to avoid adverse CC impacts.

Therefore, as the climate stabilizes towards mid-century, summer tourism could continue to be viable into the twenty-second century. Mitigation will also hopefully promote research and development policies that will drive technological development so that aviation becomes carbon neutral (without offsetting) and is therefore not constrained by CO_2 abatement targets, which can help overcome one of its major challenges to growth. This could counteract the medium-term (5–10 years) demand shock for existing attractive tourist destination explained in Fig. 25.1.

The adaptation side is a push factor which will increase or help stabilize tourism demand in the short and medium-term. For example, Greek and even EU governments could promote Mediterranean tourism by shifting the school holiday period to the months where comfort-indexes are appropriate for Northern Europeans.

Greece could do the same to encourage its citizens to continue holidaying domestically rather than travelling north to avoid the increasing summer heat (Dimitriou and Thomas 2008).

The CC Implications for the Greek Aviation and Tourism Markets

CC Implications for Tourist Demand

The purpose of the demand side analysis is to identify key variables from the literature and provide a qualitative assessment of climate change impacts on demand (Eurocontrol 2010; Daley et al. 2008; Dimitriou and Thomas 2008; Dimitriou et al. 2015). A substantial literature exists on tourism demand models for Greece using the classical variables listed in above figure. These forecasting approaches are based on quantitative methodologies using causal econometric models (Song and Li 2009). The operation of demand variables is intuitive; however their precise values in the models vary significantly. In general, income, stability and advertising are positively correlated with tourism demand, while prices, exchange rates and transportation costs are negatively correlated.

The following Fig. 25.3 divides the variables between classical (those which are used in existing tourism demand models in European destinations) and the new climate related variables which need to be included in the models.

CC variables will have significant overall effects on Greek tourism demand, because not only are new variables that should be internalized in existing causal models, but they will impact the classical variables in such a way that is likely to reduce overall demand. The branch of economics, economic geography, indicates that the values assigned to classical variables for the models that forecast tourism demand in Greece are unique to the country and Fig. 25.3 illustrates this (Dritsakis 2004). These variables are self-explanatory and interrelated. For example, although natural and climatic capital may exist in many countries, it is a combination of the existing tourism infrastructure and historical levels of tourism that together with the natural and climatic capital explain why volumes of tourism are higher in certain countries.

Indeed the costs of tourism trade, like trade in general, explains these patterns. A country's comparative advantage in tourism is a function of the costs associated with distance, infrastructure and the agency and transaction costs associated with industry and institutional structures. These accumulated comparative advantages are more complex than simply ambient temperature or even aviation infrastructure, they take time to develop and therefore the comparative advantages also take time to erode. In short, the classical variables assume existing assets and cannot be viewed as operating in a vacuum.

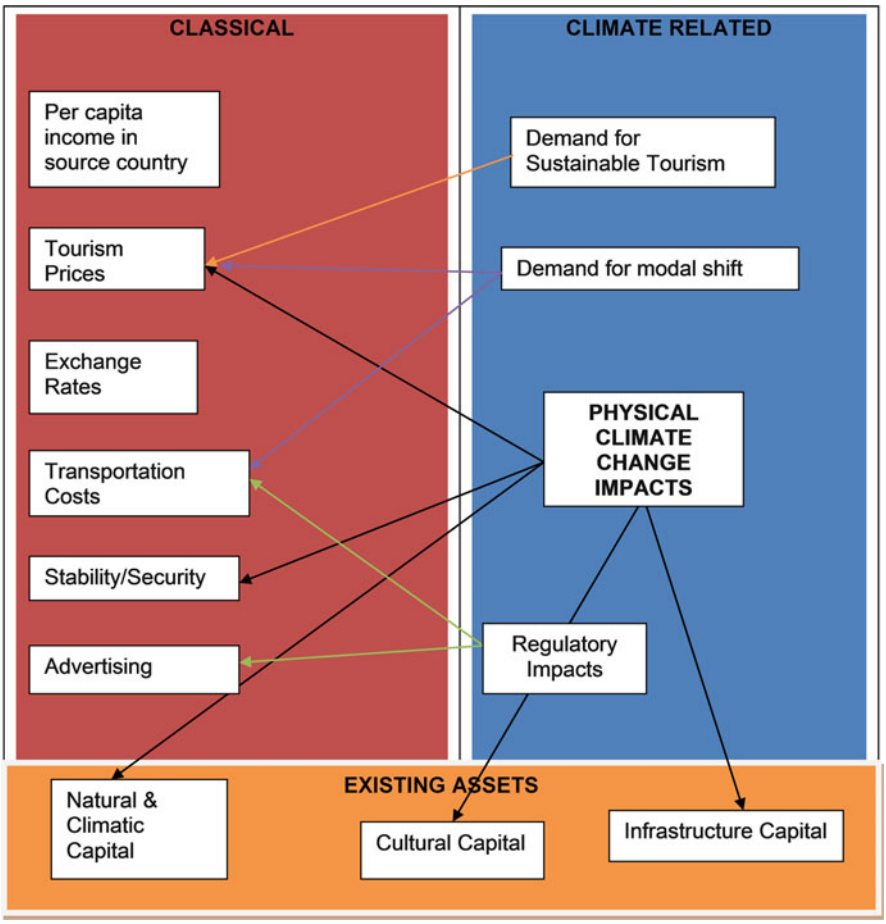

Fig. 25.3 Demand side variables for tourism

Demand for Sustainable Tourism and Transport

The sustainability of tourism resorts is an additional variable to the carbon intensity of transportation. The literature on sustainable tourism demand is not very developed. Although most studies have not found that sustainability ranks highly on factors affecting tourism destination choice (Brau 2008), it is possible that as climate change impacts become more severe and public awareness increases, sustainability will become a significant variable for tourism demand. This is a variable Greece will have to control. It should therefore develop a strategy to be ahead of the curve in sustainable tourism destinations to compensate for the carbon intensity of its reliance upon long distance transport. Another possibility is for Greece to pay for offsetting the emissions from tourism related transport, energy

and water use. This may be contrary to EU state aid rules, but exceptions could be discussed for tourism dependent EU countries.

Literature reveals that passengers have a general understanding of climate change and the link between aviation and climate change (Daley et al. 2008). However, passengers seem to believe their aviation use is acceptable and that the responsibility for addressing aviation's impact on climate change lies with the government, airlines and manufacturers. This demonstrates that in Europe a high value is placed upon air travel to go on holiday, for weekend breaks, to visit friends and family and to meet religious and cultural demands. The multi-cultural nature of many European states, their relative geographic isolation and the poor quality of 'holiday weather' in home countries increases the perceived value of an "ability to fly". They therefore appear reluctant to give up the high-speed-long-distance services offered by the aviation industry unless a comparably priced alternative mode of transport, like high speed trains, becomes available. These generalizations can in principle be extended to the other major source countries for Greek tourism like Germany and Holland. Consequently passenger demand for leisure air travel is unlikely to diminish in the near future, without severe price or other forms of aviation rationing by government.

Regulatory Impacts

Policies that restrict aviation growth or price carbon will increase the cost of transportation to Greece. The exact value of demand decrease depends primarily on the estimated carbon price and price elasticity for each service, class and route as well as the ability of airlines to pass-through costs to passengers. If governments decide to constrain aviation growth—this is uncertain in the short to medium term—there are three regulatory options being discussed to deliver this objective:

- Personal carbon allowances (for domestic consumption (utility bills), travel (car, public transportation) and air travel (domestic and international aviation).
- Fiscal responses designed to constrain demand (see below).
- Slot pricing and availability controls.
- Airport infrastructure constraints to restrict the ability to respond to demand.

Policies (rationing forms of aviation, informational campaigns, etc) intended to promote local tourism as a way of meeting national carbon budgets and prioritizing 'necessary' aviation, could have a similar effect as carbon pricing. The need for this rationing mechanism is well recognized in Bank of Greece report (Tsartas and Papatheodorou 2014) where a cap on growth could imply a top-down form of government prioritization of different forms of aviation according to available substitutes and environmental impacts. For example, governments could prioritize long-haul over short haul, business travel over tourism. Control mechanisms existed in the past when traffic distribution rules were in place. These could be

reinstituted and motivated less by who (which carriers) and more by what (what destinations for what purpose).

Demand for Modal Shifts

Emissions from aviation contribute the largest share of total Greek tourism industry emissions. If the aviation industry faces carbon pricing and caps on growth, there may be a significant demand for alternative forms of transportation to tourism destinations. Development plans for high speed rail lines are extensive in some parts of Europe (Committee on Climate Change 2009) and tourists could decide to use high speed rail links for Mediterranean or Atlantic destinations, particularly in Southern France, Northern Italy and Northern Spain. This combined with the heat stress induced by climate change could also shift tourism patterns away from the Southern Mediterranean and Aegean area (Eurocontrol 2010), with a consequential significant impact upon economies in that region.

Because Greece is isolated in South-East Europe, where no plans for high-speed rail exist, and 80 % of tourists arrive in Greece by air, its tourism is particularly vulnerable to policies that increase the price of aviation and decrease (in relative or absolute terms) the price of modes such as maritime and rail. Greek tourism is also vulnerable to changes in consumers' attitudes towards aviation for tourism transport (Daley et al. 2008). However, policies that promote and incentivize other modes of transportation like maritime and rail, combined with warmer dryer summers in Northern Europe could have a significant negative effect on Greek tourism demand. Subsidies or simply greater consumer demand for high-speed rail would bring down the cost of rail journeys on high density routes making transport and tourism packages for these routes cheaper compared to Greece which remains dependent on high carbon aviation.

SWOT Analysis for the Aviation and Tourism Development in Greece

The key objectives of the SWOT analysis are: (a) to identify key parameters regarding aviation and tourism development; (b) to evaluate the benefits and weaknesses, and (c) to support decisions at the level of strategic planning. The level of significance providing in a scoring scale from *–3* to *+3* (strongly positive: +3, medium: (−1,+1), significant negative: −3). The analysis key results are given in the following table (Table 25.1).

The next step is to analyse the key opportunities and threats from the aviation and tourism business, as briefly presented in the following Table 25.2.

Table 25.1 Aviation business strengths and weaknesses for Greece, by their level of significance

Level of significance			
Development issues	Positive (+3)	Medium (−1,+1)	Negative (−3)
Strengths (S)			
S1. Regional development	• Additional capacity and low pricing strategy at airports stimulate demand for air transport • New investments in airport and tourism infrastructures • Extension of the other trade sectors (e.g. agriculture) • Additional income to residents	• Improve airport facilities and services focused on leisure and business traffic • Increase of land prices in tourist destinations • Population growth • Control of unemployment • Improve quality of life and social services	
S2. National economy	• New traffic from European and long-haul destinations (e.g. Russia, Asia, etc.) • New jobs in aviation, tourism and other relative activities • Improve national GDP	• Improve accessibility to attractive tourism destinations • Additional business for the national air carriers • Establish Greece as the leading country in Balkans	
S3. European aviation and tourism industry	• More capacity and slots to the European air transport network • Stimulate demand to existing and new destinations • Additional income to tourism and aviation business	• Establishment of business oriented management culture • Improve knowledge regarding aviation and tourism business • Reduce business risk in aviation and tourism industry	
Weaknesses (W)			
W1. Aviation business		• Business focuses on holiday/seasonal traffic • Status of Greek national economy • Cost of the new investments • Competition in national aviation business	• Fare policy to meet future levels of demand • Taxation and accreditation of airports to meet national environmental targets • Uncertainty in tourism and aviation industry
W2. Cost of services and		• Economies of scale in aviation and tourism industry • Authorities	• Total transport chain costs for the users • No specific strategy towards mitigation

(continued)

Table 25.1 (continued)

Level of significance			
Development issues	Positive (+3)	Medium (−1,+1)	Negative (−3)
public sector productivity		performance and national regulation framework • Management performance of state owned operators in the most of the airports	environmental impacts • Price of holiday package
W3. Financial variables		• Government/public authorities procedures in decision making • Interest for investments in aviation and tourism business • Condition of private-public contracts to operate/manage airports	• Project cost and payback period for the new investments in aviation • Conditions in national economy • Financial risk in aviation and tourism business

The relationship between existing strengths/weaknesses and future opportunities/threats of the expected environmental changes in business for Greece is presented in the following Table 25.3.

Key Messages for the Aviation and Tourism in Greece

The central message for decision makers is that the positive impacts on regional development, the national economy, aviation and tourism businesses is greater than the negative impacts. This is because of the high potential of new investments and the changing environment in Greek airports management, lead to stimulate additional traffic. However, environment protection policies and the competitive environment in tourism and aviation are expected to be a significant threat for the further development of these industries in Greece. By mitigating or adapting to the environmental weaknesses and threats, the decision to promote aviation growth is strengthened in the SWOT analysis.

The above analysis indicates that the following issues will reduce the environment impacts associated with the development of both the air transport and tourism industries:

- Land use planning in tourism and airport areas;
- Improved ground transport;
- Reduced consumption of energy and water;

Table 25.2 Aviation business opportunities and threats for Greece, by their level of significance

	Level of significance		
Decision issues	Positive (+3)	Medium (−1,+1)	Negative (−3)
Opportunities (O)			
O1. National aviation business	• Add new airport capacity to meet demand growth • Budget carriers (LCC) growth • Attract long-haul carriers to/from Russia and Asia • Non-aeronautical revenues from the retail	• Reduce transportation cost to/from Greek domestic destinations/islands • More scheduled flights • Additional income from the growth of demand	
O2. Tourism business development	• New demand (Russia,, Middle East, Asia and Africa) • Provide advantages regarding competition in Mediterranean • New income from tourism	• New businesses in other tourism sectors (sports, education, health, etc) • Attract high income tourists • Extension of the tourism season	
O3. Aviation business in Europe	• New opportunities for European air carriers • Improve connectivity in European region • Stimulate demand in middle-long haul destinations in Asia	• Investment in aviation business • Stimulate additional traffic in regional—secondary—airports in south-east Mediterranean • Growth of leisure traffic in Europe	
Threats (T)			
T1. Business environment and economy		• Niche nature of the Greek market • Growth of European GDP and financial stability in Europe • Investments to other transport modes (sea, rail, etc.)	• Rise of oil and energy prices • Circularity and uncertainty in aviation and tourism market • Euro exchange policy • National economy and financial performance
T2. Environmental		• Growth of environment sensitivity in Europe (e.g. green travelers)	• Restrictions to aviation growth • EU green policies to

(continued)

Table 25.2 (continued)

	Level of significance		
Decision issues	Positive (+3)	Medium (−1,+1)	Negative (−3)
Impacts mitigation		• Environmental taxation • Water and energy resources	control carbon emissions • Operational constraints at European airports
T3. Competition		• Competition in aviation and transport industry • Advantages (e.g. infrastructures, quality of services) compared to the other destinations in Mediterranean	• Barriers to entry for new investors in aviation and tourism industry • National economy and financial statues in Europe • Euro exchange policy

Table 25.3 Analysis of the relationship between strengths/weaknesses and opportunities/threats

	Aviation and tourism business changes						Score	
Decision issues	Opportunities			Threats			(scale +3,−3)	
Strengths	O1	O2	O3	T1	T2	T3	(+)	(−)
S1	+3	+3	+3	+1	−1	+1	+11	−1
S2	+3	+3	+1	−3	−1	−1	+7	−5
S3	+3	+1	+3	−1	−3	+1	+8	−4
S. Score (+)	+9	+7	+7	+1	0	+2	**+26**	
(−)	0	0	0	−4	−5	−1		**−10**
Weaknesses								
W1	+1	+1	+1	−1	−1	−1	+3	**−3**
W2	−1	−1	−1	−1	**−3**	−1	0	−8
W3	−1	−1	−1	−1	−1	−1	0	**−3**
W. Score (+)	+1	+1	+1	0	0	0	**+3**	
(−)	−2	−2	−2	**−3**	−5	**−3**		**−17**
Aviation/tourism impacts score	+11	+9	+7	+2	0	+1	**+29**	
	−1	−1	−1	−4	−8	−5		**−27**

- Use of renewable energy;
- Introduction of specific regulation to address wastes;
- Re-development of the existing airports to reduce carbon intensity of their operations

Despite these, certain conclusions can be drawn with respect to demand for Greek tourism at least in the short-term (1–5 years) and medium term (5–10 years):

- It is likely that significant improvements in high speed rail combined with improving ambient summer temperature in Northern Europe will decrease demand for Greek tourism in the medium-term. In the long-term (after 2030) the interaction of these variables will be very significant. Maritime based tourism could help Greece fill the Northern European tourist gap, however this depends on the carbon price and the ability of Greece to attract tourists from nearby countries.
- Consumer behaviour is unlikely to be influenced by informational or promotional policies unless combined with high carbon prices and/or the awareness of increased severe physical climate change impacts.
- Certain adaptation measures are viable in Greece: (1) promoting off-season cultural tourism; (2) diversifying the regions offering beach tourism; (3) promoting sustainable tourism locations and offsetting aviation emissions.

Conclusions

Among the many effects of CC, the existing unforeseen strain on extend capacity by new infrastructure and business as usual model of growing tourism must be constantly revaluated. In this paper, the CC implications for key demand and supply variables impact the aviation-tourism equilibrium are described. The need for new actions and an updated strategic plan is highlighted. The findings of this research provide important messages for decision and policy makers for Greece, which is a very attractive tourist destination, messages that will be of equal importance and significance for many other regions in the same latitude.

The key findings provide evidence that the implications of CC for aviation and tourism require not only for air traffic accommodation activities but also national tourism planning activities. Ultimately, the costs of adaptation policies must be weighed against the economic benefits of tourism, which are very substantial in Greece. Consideration at the EU level must also be given, because tourism has been a strategic target for EU funds in promoting sustainable economic development in tourist destinations. While the costs of adaptation will likely be born in part by the EU, so too will the costs of inaction in the form of transfers to a weakened Greek economy; weighing the costs of action and inaction is an exercise worth pursuing through further research.

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