Athens Journal of Tourism - Volume 7, Issue 2, June 2020 – Pages 87-100

The Impact of the Covid-19 Pandemic on Greek Tourism

By Gregory T. Papanikos[*]

This paper examines the economic impact of the 2020 pandemic on international Greek tourism receipts. The uncertainty and risk surrounding the epidemiological conditions make any reliable prognosis of the 2020 and beyond almost impossible. This study relies on information regarding the international pre-bookings of European destinations. According the to the European Union's Travel and Tourism Industry, pre-booking have fallen by 60 to 90 percent. Using these two extreme values and the average of the two, this study develops three scenarios to examine the impact of the pandemic on Greek tourism. In the best of the three scenarios, the contribution of Greek tourism to GDP will drop from 16% to 6.6%. The output loss amounts to €16.8 billion.

Keywords: *Pandemic, Covid-19, crisis, tourism, Greece, economic impact*

Introduction

In 2019, 34 million tourists arrived in Greece from different countries generating €18.2 billion of international tourist receipts. These were historical record numbers for the Greek tourism industry. In addition, 2020 looked even brighter till the pandemic outbreak mid-March in Greece. The lethal infectious disease (Covid-19) hit the Asian countries first and then spread out to Europe and eventually to the rest of the world. Almost all countries banned international travel. The Greek tourism market collapsed as did all the tourism markets in the world and especially in Europe.

Greece belongs to the European Union and is a member of the Eurozone since its inception in 2002. Regrettably for all those who believe in the so-called European Project, the European Union's reaction to the current pandemic has been far-fetched. There was a complete lack of co-ordination and each member state has been applying its own policies violating the principle of the freedom of movement of goods and people.

The recent (13 May 2020)[1] releases of a series of documents adopted by the European Commission demonstrate the weakness of the most important European Institution to take a strong position on the issue and most importantly coordinate their actions. By a strong position, I mean evidence-based criteria to be applied by the countries concerned. For example, if the daily number of people infected is below 10 for 14 days (the minimum time required to recuperate from the disease), then this country can be declared pandemic free. Travel between such countries should be allowed. The European Commission made a number of proposals which do not address the problem in practical business-like terms. They wish that international travel is permitted if the epidemiological situation improves. But how

[*]President, Athens Institute for Education and Research (ATINER), Greece.

[1]See European Commission (2020a, 2020b, 2020c, 2020d).

https://doi.org/10.30958/ajt.7-2-2 doi=10.30958/ajt.7-2-2

does one define improvement? And under what conditions such travels will be permitted? In this paper, I do provide some evidence what it could be meant by improvement.

Pandemics in economics are analysed as external shocks similar to other events such as earthquakes, floods, droughts, wars, terrorist attacks etc. A recent short overview is given by Rasul (2020). Theoretical and empirical studies of pandemics have shown mixed results even though most of them point towards an overall negative effect; in the short, medium and long run. Some of these studies are briefly reviewed in the next section of the paper. The most important constraint of economic impact analyses of previous pandemics is the availability of data. This explains why most economic impact studies use the 1918 epidemic and other smaller outbreaks of the 20th and 21st century as their natural experiments to examine economic impacts. On the other hand, the social and political impacts are easier to assess because there are references made to them. The first well known epidemic of 430 BCE narrated by Thucydides in his work of the Peloponnesian War (Papanikos 2020) has a detailed exposition of the social, political and anthropological effects of the plague. Unlike Pericles, Thucydides himself was infected and survived.

The current Covid-19 pandemic has a particularity when is compared with the 1918 epidemic; never before people travelled so much for business, education and recreational (pleasure) purposes. The travel industry in 2020 cannot compare to what this was in 1918; almost non-existent. The pandemic hit badly damaged the tourism industry by completely shutting down the supply and the demand of tourism services. It can be thought of as a market failure to satisfy a potential demand. But there is more than that. It is not economics that determine the outcome of the tourism market but epidemiology. It is not the invisible hand of the market but the invisible virus of the coronavirus. This explains the difficulty in providing forecasts of the economic impact of the pandemic on the tourism market even if one asks the Oracle of Delphi (i.e., applying the Delphi Method); economics play little or no role at all. The existence or not of the market is determined by the harshness of the pandemic which create enormous uncertainty and uncalculated risks.

Despite all these deficiencies, this paper attempts to estimate the impact of the current pandemic on the international Greek tourism market. The literature review looks to shed some light on the possible effects on the aggregate economy and the tourism market in particular. An eclectic review of this literature is given in the next section of the paper. Some leading indicators of the pre-booking cancellation are used to develop three possible scenarios. These are examined in the third section of the paper. The most important determinant of the tourism impact is the lift of the lockdown -conditionally or unconditionally. The fourth section look at this issue using data of the number of people infected in 19 countries which constitute the most important earning source (two-thirds) of total international Greek tourism receipts. The last section of the paper concludes.

The Impact of Pandemics in an Historical Context

Lack of data restricts economic impact analyses of pandemics. Papanikos (2020) examined the famous ancient plague narrated by Thucydides and made a comparison with the synchronous pandemic of 2020. The comparison was made in terms of individual, social and political effects. Data are not available to make an economic impact analysis. In addition, the co-existence of a war and a plague makes the impact evaluation of the ancient Athenian plague very difficult indeed. This might also be the case of the 1918 epidemic because occurred immediately after the First World War if not during the war.

A number of studies had been published before the outbreak of the synchronous pandemic which attempted to assess the economic impact of a pandemic. All of these studies suffer from methodological problems which are mainly the result of lack of data and have been recognized by authors themselves. These studies use a rule of thumb methodology, back of the envelope calculations and anecdotal evidence to measure the economic impact. Despite all these problems their estimates seem to be comparable with what current research has provided for the synchronous pandemic. Studies have measured the overall economic impact of more recent pandemics. Eichenbaum et al. (2020) developed a theoretical epidemiology model to study the impact of the synchronous pandemic. The best policy is containment which increases the severity of the recession but according to their benchmark estimates 500 thousand lives would be saved in the USA. However, this study does not measure the lives lost if the reduction in economic growth has a negative impact in infant mortality.

Meltzer et al. (1999) estimated the possible effects of a hypothetical influenza pandemic in the United States. They used death rates, hospitalization data, and outpatient visits. They reported estimations of 89,000 to 207,000 deaths; 314,000 to 734,000 hospitalizations; 18 to 42 million outpatient visits; and 20 to 47 million additional illnesses. Their estimated economic impact was between 0.7 and 1.7 percent of GDP. Jordà et al. (2020) studied 15 major pandemics going back to 14th century by looking at the rates of return on assets. They found persistent negative after-effects that lasted for about 40 years. Interestingly, they found a positive effect of wars. Ma et al. (2020) used panel data of 210 countries for the 1960-2018 period. They observed a 2.57 percent negative impact on real GDP. Policy interventions early on had a mitigated effect on the reduction of economic growth. Most studies take advantage of data availability of the 1918-1920 epidemic (so called the Spanish Flu). Barro et al. (2020) looked at this epidemic using data from 43 countries. For an average country, they found an economic contraction of 6 to 8 percent. Garrett (2007) also examined the 1918-1920 epidemic. Recognizing the lack of economic data, the study relied on anecdotal evidence and print media to assess the economic impact of the epidemic. The author, in his opening paragraph, stated that *'The possibility of a worldwide influenza pandemic (e.g., the avian flu) in the near future is of growing concern for many countries around the globe*.'

The author used influenza mortalities in the Cities in the Eighth District States of the USA. The economic impact is based on anecdotical evidence of print media. They do, however, provide useful information. Here is a compilation. *'Merchants*

in Little Rock say their business has declined 40 percent. Others estimate the decrease at 70 percent.' '*The retail grocery business has been reduced by one-third*.' *'One department store, which has a business of $15,000 daily ($200,265 in 2006 dollars), is not doing more than half that.' 'The only business in Little Rock in which there has been an increase in activity is the drug store. Fifty percent decrease in production reported by coal mine operators.'* These numbers look similar to the effects of the current pandemic reports. For example, these are about the same estimates of OECD (2020) for the current pandemic impact on tourism.

Garrett (2007) observed that cities and states having greater influenza mortalities experienced a greater increase in manufacturing wage growth over the period 1914 to 1919. This is because the capital-labor ratio increased due to the higher mortality rate. The author concluded that *'Society as a whole recovered from the 1918 influenza quickly, but individuals who were affected by the influenza had their lives changed forever. Given our highly mobile and connected society, any future influenza pandemic is likely to be more severe in its reach, and perhaps in its virulence, than the 1918 influenza despite improvements in health care over the past 90 years. Perhaps lessons learned from the past can help mitigate the severity of any future pandemic.'*

Many other studies have studied the economic impact of the 1918 epidemic with mixed results. Studies found positive long-term impacts. Brainerd and Siegler (2003) model the 1918 epidemic as an exogenous shock to the USA economy. They used data from 1919 to 1930. They controlled for a number of factors such as initial income, density, urbanization, human capital, climate, the sectoral composition of output, geography, and the legacy of slavery. They found a robust positive effect of the 1918 epidemic on per capita income across states during the period under investigation. Almond (2006) used the 1918 epidemic as a data generation process of a natural experiment to test the fetal origins hypothesis. He found that fetal health affected almost all socioeconomic groups recorded in the 1960, 1970, and 1980 Censuses. Those who were in utero during the epidemic of 1918 and their mothers were infected; they had a 15 percent lower probability to finish high school. Also, men's wages were 5 to 9 percent lower. Correia et al. (2020) used geographic variations in mortality rates of the 1918 epidemic in the USA. They found that manufacturing output decreased by 18 percent which was the result of the co-movements of both the supply and demand. They also looked at government intervention initiatives at the city level. Cities which intervene earlier and more aggressively had better economic performance and they grew faster after the epidemic was over.

World Bank (2017) published a report with estimates of GDP loss during a pandemic. They used a methodology based on the study of Fan et al. (2015). As far as Greece is concerned, the World Bank estimated that the loss would amount to 0.44 percent of its GDP. The Global effect was estimated to be 0.7 percent of GDP.

It remains to be seen what the final impact of from the Covid-19 2020 pandemic will be and previous studied may not necessarily be the best guide. In a case study of Sierra Leone of the 2014-16 Ebola outbreak, Bandiera et al. (2018) found a decrease in income of 10.9 percent. The government actions were

identical to the measures taken by many governments to cope with the 2020 pandemic: (a) lockdowns and travel bans, (b) all schools were closed and (c) there was a mobilization to record cases and track contagion. These have had dire effects on economic activity; especially the travel bans and the lockdown of shops had devastated effect on tourism. This has been the Greek case which is examined next.

The Greek Tourism Market under the Pandemic

The literature on pandemics suggests that the short-run impacts are considerable but the long term ones are more positive. The economic textbook circular flow assumes that suppliers (businesses) and households freely interact in the factor and product market incurring the relevant costs and generating revenues. Any intervention by an external agency (e.g., government, trade union, employees' associations) or contingency (e.g., a war, a terrorist attack, an earthquake) have an impact on the demand and supply of the final product (e.g., recreational tourism services) and all the intermediate products and factors of production required to produce the final product. Applying this to tourism, economists using their analytical tools can estimate the effect of any intervention on the demand and supply side of tourism services.

However, the current situation of the pandemic's impact on the supply and demand of tourism services cannot be analysed using the traditional tools of economic analysis. The impact of the pandemic cannot be analysed as an external shock. This is normally done when a negative external shock impinges on the supply and demand of a product (e.g., hotel services), or the demand and supply of an entire economic sector (e.g., tourism industry) or on the aggregate economy.

The 2020 pandemic impact is different. Its effect cannot be measured as a shift of the demand and/or supply curves because simply these curves do not exist. For example, due to the coronavirus, there is neither supply nor demand for tourism services. When the coronavirus closes a hotel, the service of this hotel does not exist anymore. When a country forbids its citizens to travel abroad, this is not a shock on the demand curve (the demand curve does not shift to the left) but the demand collapses, i.e., it does not exist anymore. There is a potential demand but this cannot be realized under a situation of uncertainty and risk that a pandemic creates. Thus, there is no economic policy that can solve this problem when for medical and institutional reasons the market is forced to shut down its operation on both the supply and the demand side. That is an economic policy which can open up the market by removing the barriers to trade.

It is not an economic problem; it is a medical (epidemiological) problem which has serious economic and social repercussions including the entire process of sustainable development and tourism[2]. It is the subject matter of infectiology.

[2]The effect of the Covid-19 crisis on tourism and sustainable development is examined in Jones and Comfort (2020). The authors offer an excellent recent overview of the relationship between tourism and sustainable development and conclude with some policy and research suggestions at the level of government and business. Prudently so they emphasize that their paper is not an empirical one

Economists cannot forecast the impact till the infectiology will determine when the circular flow of the tourism market can be set in operation again. Until the Covid-19 pandemic runs its course–and the conditional or unconditional opening of the market begins to take place, economic analyses may have limited value. Conditional means that the terms of trade will change which will result in an increase in costs. Then economists can be useful; at the extreme what is epidemiologically or politically feasible may not be economically operational and there will be a market failure because of the constraints imposed on it.

What is optimal from a medical point of view in air travel (e.g., 40 percent capacity) may be prohibited from an economic point of view because such capacity rates do not cover the fixed cost of operation. And the economic textbook has a dismal prognosis of what happens to the business in such situations. In the Greek context of so many small islands and small hotels[3], strict recommendations as the ones proposed by the European Commission in its recent documents exclude many small Greek destinations. For example, they recommend full-fledge hospital and medical facilities. The numerous small touristic islands have serious problems of providing basic health services in normal (non-epidemic) situations. If such restrictions are imposed, the small islands tourism markets will collapse. Their hotels can open to satisfy any demand.

The economic impact of a closed market is very simple to estimate. The impact on the Greek tourism of a closed market in 2020 is equal to the tourism multiplier (e.g., 1.6) multiplied by tourism receipts[4]. If we assume that the international tourism receipts would have remained the same as in 2019 without the pandemic, then in the second quarter of the 2020, Greece will forego international tourism receipts of 5 billion euro[5]. If they stay closed for the rest of 2020, then the foregone international tourism income would be 17.4 billion euro. Thus, the direct effect will be 17.4 billion euro and the total effect 17.4x1.6=27.9 billion euro or 15 percent of the Gross Domestic Product (GDP). And this does not take into consideration the domestic tourism which is not small either.

According to estimates reported by the European Commission (2020a, p. 9) *'…revenue losses at European level have reached 50% for hotels and restaurants, 85% for tour operators and travel agencies, 85% for long-distance rail and 90% for cruises and airlines. EU travel and tourism industry reports a reduction of bookings in the range of 60% to 90%, compared to the corresponding periods in previous years. The crisis has hit SMEs the hardest: lacking liquidity and facing uncertainty, they struggle to stay afloat, access funding and maintain their employees and talent*.'

Households face uncertainty and risk as well. Even if the lockdown is lifted tomorrow, the uncertainty and the risk will remain and this will affect the demand

---

because of the uncertainty involved. The key issue is when the pandemic will be terminated and so far, this does not look very promising.

[3]I have examined elsewhere in detail the economics and the employment of Greek Hotel Enterprises at the aggregate and regional level; see Papanikos (2000, 2001, 2002).

[4]See European Commission (2020a, pp. 7-8). They give an average tourism multiplier of 1.56 for all the European Union. For Greece, is a little bit higher.

[5]Tourism data is retrieved from *The Border Survey* conducted and reported by Bank of Greece (https://www.bankofgreece.gr/en/statistics/external-sector/balance-of-payments/travel-services).

for tourism and especially international tourism. To be fair, the European Commission has recognized this important aspect of the tourism market and has outlined measures and guidelines which can reduce the uncertainty and risk by disseminating in real time all available information using the modern information technology and communications. But this may have the opposite effect. When the consumer is informed (he will receive a message in real time) that where he plans to travel (a small Greek island) there is a case of someone being infected, then he would think twice before taking the trip. Once on the island, if he receives such a message, all tourists would want to get out as soon as possible. Under such circumstances, Greek tourism will suffer not this year only. And this will interrupt an unprecedented tourism growth in the last two decades. Table 1 shows the recent history of international Greek tourism in terms of receipts and arrivals[6]. As a percentage of GDP, international tourism receipts increased their GDP share from 5 percent in 2005 to almost 10 percent in 2019. Both GDP and tourism receipts are expressed in nominal terms. Thus, comparisons overtime can be made only using the percentage of tourism receipts to GDP.

Table 1. *International Tourism Arrivals and Receipts, 2005-2019*

Year	Int'l Tourism Receipts Billion €	Int'l Tourism Arrivals Millions of Tourists	Spending per Tourist Arrival €	GDP Billion €	Tourism Receipt as a % of GDP
2005	10.73	14.39	746	199.2	5.39%
2006	11.36	15.23	746	217.9	5.21%
2007	11.32	16.17	700	232.7	4.86%
2008	11.64	15.94	730	242.0	4.81%
2009	10.40	14.91	697	237.5	4.38%
2010	9.61	15.01	640	226.0	4.25%
2011	10.50	16.43	639	207.0	5.07%
2012	10.44	16.95	616	191.2	5.46%
2013	12.15	20.11	604	180.7	6.73%
2014	13.39	24.27	552	178.7	7.50%
2015	14.13	26.11	541	177.3	7.97%
2016	13.21	28.07	470	176.5	7.48%
2017	14.63	30.16	485	180.2	8.12%
2018	16.09	33.07	486	184.7	8.71%
2019	18.18	34.00	535	187.5	9.70%

Data Source: GDP (AMECO). International Tourism Receipts (Bank of Greece).

This past positive history of international tourism receipts will surely come to an end in 2020. Unfortunately, it is very difficult to foresee the economic impact of a pandemic in general and on tourism in particular. Everything depends on the epidemiological variables. The key question is the termination of the pandemic. Once this is determined, then a process of recuperating starts which results to an

[6]I have examined these in detail in by book on Greek tourism receipts; see Papanikos (2005).

increasing rate of economic growth. The empirical evidence is mixed on this issue and there seems to be both transitory and permanent effects. In some cases, the effect might be a strong positive one if the economy does not suffer losses of its productive human capital. But even if it suffers such a loss, the negative effect is mitigated by an increase in the capital-labour ratio.

In this study, I use the leading indicators provided by the early bookings for tourism destinations. According to the European Commission report (cited previously), the European Union's travel and tourism industry has experienced a reduction in tourism bookings in the range of 60 percent to 90 percent. These reductions include cancellation of many events such as conferences, festivals, cruises, etc., which have been permanently cancelled. In Greece almost all summer sports, cultural and educational events have been cancelled or postponed. These events attract hundreds of thousands of people.

I assume that the pandemic had a very small (5 percent) impact in the first quarter of 2020. I then make three scenarios of an overall reduction of 90 percent, 75 percent and 60 percent. The estimates are shown in Table 2. Three scenarios are reported assuming (a) a reduction of 90 percent which implies that only 10 percent of tourism receipts will be made relative to 2019; (b) a reduction of 75 percent and (c) a reduction of 60 percent. The latter is the best-case scenario. Alternatively, one could envisage scenarios that the reduction rate of 90 percent is reduced throughout the rest of the 2020 but the critical issue is when the lockdown will end. This is a situation of uncertainty and not one of risk.

Table 2. *The Pandemic Impact on Greek Tourism: A Scenario Analysis*

	2019 Actual (€M)	Coef. A	2020 Scenario A (worst case)	Coef. B	2020 Scenario B (average)	Coef. C	2020 Scenario C (optimistic)
Q1	747	0.95	709	0.95	709	0.95	709
Q2	4667	0.1	467	0.25	1167	0.4	1867
Q3	10693	0.1	1069	0.25	2673	0.4	4277
Q4	2072	0.1	207	0.25	518	0.4	829
Total (Year)	18179		2452		5067		7682
% of 2019			13.5%		27.9%		42.3%
% Reduction			86.5%		72.1%		57.7%
GDP Impact	29086		3924		8108		12291
% of GDP Impact	16%		2.1%		4.3%		6.6%

In 2019, international tourism receipts amounted to a total of 18.2 billion euro but more than half (59 percent) of these were realized in the third quarter of the year; 26 percent in the second quarter; and 11 percent in the last quarter. Only 4 percent of the receipts were made in the first quarter of 2019. Assuming that these

proportions will remain the same in 2020 -the seasonality of Greek Tourism is one of its permanent features-, the impact of the pandemic on the tourism receipts can be estimated using the range of the fall of pro-booking of 60 percent to 90 percent. These result to three impact coefficients of 0.1 in the worst-case scenario, 0.25 in an average scenario and 0.4 in an optimistic scenario.

In the worst-case scenario the overall decrease in tourism receipts is 86.5 percent relative to 2019. From 18.2 billion, receipts will decrease to 2.5 billion. Assuming a multiplier effect of 1.6, then the impact on Greek GDP is a reduction of 13.9 percent relative to 2019 (16 percent-2.1 percent). In 2019 the international tourism contribution to GDP was €29.1 billion (16 percent) while it is expected to be only €3.9 billion in 2020 if the worse-case scenario is realized (2.1 percent of GDP). That said, as many studies have shown of previous pandemics, the overall GDP impact depends on how strong and how fast is the government intervention. In the case of Greece, government reacted quickly providing income to employees and liquidity to employers who were affected by the lockdown. The best-case scenario still assumes a considerable reduction in tourism receipts; from €18.2 billion in 2019 to €7.7 billion. The loss of output relative to 2019 is €16.8 billion (29.1-12.3). In this optimistic scenario the tourism contribution to Greek GDP is 6.6 percent as opposed to 16 percent in 2019.

Predicting the Lockdown Lift

When should countries lift the lockdown? This is a very difficult decision to make and the European Commission does not provide any criteria for the lifting of the lockdown on international tourism. Rather, it vaguely refers to a better epidemiological situation. How should a critical situation be defined? What is the threshold between lifting and not lifting the lockdown? But what are the cost and benefits of a lockdown? How should they be measured? Do they add up arithmetically or geometrically? Does the lockdown costs only a reduction of economic growth (loss of GDP) or it costs lives as well? How do we evaluate the loss of lives due to coronavirus against the loss of human lives due to a reduction in economic growth? The relationships between economic growth and health variables such as longevity and mortality rate (especially infant mortality) have been well documented in the theoretical and empirical economic literature; see among many others the studies by Niu and Melenberg (2014), Hanewald (2011), Swift (2011), and Kalemli-Ozcan (2002). The causality may run both ways. An initial increase in income or per capita income or its distribution may positively affect longevity and quality of health, which, in turn, through its human capital effect may increase per capita GDP. If tourism enhances human capital -this is the case when recreation and leisure activities are considered a necessity-, this results in future raises of the productivity of labour.

In conclusion of this literature, the trade-off may be evaluated in terms of human lives lost and saved. If a slowdown of economic growth due to the lockdown increases infant mortality and the coronavirus increases the mortality rate of elderly with underlying chronic medical problems, what is the optimal size

of a lockdown in terms of its length of time and width of economic activities covered? These issues have not been addressed in the current debate of the lockdown due to Covid-19. But they are important.

If a country aims at eliminating the risk of spreading the disease, then it should lift its travel bans only when at least the 14-days moving average of the reported cases of the country of origin is zero. This does not eliminate the risk because the number of reported cases is an underestimation of the true cases; the latter include people who are infected but they show no symptoms. Another indicator would be the number of deaths but this can be an overestimation because people with underlying chronic diseases should be excluded. I give the following real example. An old woman of 93 years old with bad medical history died due to the coronavirus in Athens. Her death made headlines. The same day a young male of 30 years old without any health problem died in a traffic accident. His death hardly made it through the news. From an economic point of view, the two deaths are not two more numbers. Even from a compassionate point of view the two deaths do not carry the same weight. This appears to be the case with the synchronous pandemic. Health economists have developed their own methodology in evaluating the value of lives lost.

Table 3. *Reported New Cases of Covid-19 Infections (14-Days Moving Average) and Tourism Receipts by the Most Important Countries of Origin*

Country	Receipts €M	% of Total Receipts	As of 15 May, 2020 (14-days MA)
Germany	2959	16.3%	1002
United Kingdom	2564	14.1%	3978
USA	1189	6.5%	22517
France	1090	6.0%	745
Italy	1009	5.5%	1119
Netherlands	534	2.9%	264
Romania	483	2.7%	263
Cyprus	465	2.6%	4
Switzerland	462	2.5%	54
Austria	462	2.5%	39
Belgium	453	2.5%	375
Russia	433	2.4%	9913
Australia	371	2.0%	18
Canada	343	1.9%	1441
Sweden	258	1.4%	504
Albania	212	1.2%	8
Spain	203	1.1%	1023
Denmark	191	1.0%	100
Czech Republic	184	1.0%	44
Total	13864	76.3%	2285

Note: Data on Covid-19 infections was retrieved from the online database maintained by the John Hopkins University (https://coronavirus.jhu.edu/map.html).

If the country accepts non-zero cases, then a threshold can be established. Table 3 reports data on Greek International Tourism receipts by top countries of origin. In total these countries made up the 76 percent of total Greek international tourism receipts. Germany is at the top with almost €3 billion in 2019 followed by U.K. and USA. Which markets opens depends on the thresholds imposed by the home and the destination country. Suppose Greece imposes a restriction that no tourists can visit Greece coming from countries that in the last 14-days had a nonzero average of new cases. This is met only if in the last 14 days, the country did not report a single case. It is obvious from Table 3 that no country meets this criterion as of 15 May 2020 and it is not going to satisfy this criterion by the end of May as well.

If Greece imposes a 14-days moving average of less than one thousand, then many countries will be excluded such as Germany, USA, UK, Italy and Spain. Of course, this criterion must be combined with the rate of increase. It must be negative otherwise there is always the risk of a second wave (spike) which many epidemiologists expect to happen by the end of the summer. In this case the criterion is enhanced to include the rate of decrease of the spread of the disease. Thus, Greek tourist authorities must take some difficult decisions, especially when deciding to open up the island tourism market which so far have had zero cases of infected people. Some islands such as Crete, Rhodes and Corfu have a well-developed hospital sector and they can deal with an emergency situation but the other islands do not have such facilities. However, the risks may be even higher if the epidemiological protocols are followed. Assume that in a small island of Greece a tourist tests positive to Covid-19. As normal tourists do, he visited all the places of the small islands (e.g., museums, beaches, bars, restaurants etc.) and got in conduct with many tourists and locals. The entire island must be put on quarantine for at least 14 days. Very few will risk such a vacation experience.

Unless the pandemic is over, such risks impose nonzero economic and social costs. And as such they will considerably reduce the international and national demand for tourism. The tourism market will start returning to its pre-pandemic years only if the 14-days moving average is reduced to zero. And even then, some months or even years may be required before the uncertainty and the risks are eliminated. Tourism for recreational purposes cannot co-exist with the fear of an infectious disease. Actually, it cannot exist with any fear such as wars, earthquakes, political unrest, climate changes etc.

Conclusion

The economic impact of any pandemic is very difficult to measure including the number of people contracting the virus and dying. The review of the literature shows that the effects (positive and negative) can be immediate due to lockdown, medium due to time required to adjust to a pre-pandemic state and long-run through its effect on human capital which might last more than one generation as this has been demonstrated by the empirical verification of the fetal origins hypothesis. Based on the leading indicators of pre-bookings this study has found

that the impact of the 2020 pandemic on international Greek tourism receipts is huge. The effect on GDP is expected to be unprecedented for a non-war period. Even the economic crisis that hit the Greek economy hard cannot compare with the impact of the Covid-19 on the Greek economy. Tourism receipts reductions are expected to have an impact that ranges from 9 to 14 percent of GDP. And this is the 2020 impact. Unless the uncertainty and risk are eliminated (measured by zero cases in the last 14-days) the tourism impact will continue to exert a big strain on economic resources. Government interventions by spending public money to support household and small business proprietors' income cannot be sustained for a long period of time.

References

Almond D (2006) Is the 1918 influenza pandemic over? Long-term effect of in utero influenza exposure in the post-1940 U.S. population. *Journal of Political Economy* 114(4): 672–712.

Bandiera O, Buehren N, Goldstein M, Rasul I, Smurra A (2018) The economic lives of young women in the time of Ebola: lessons from an empowerment program. *The Abdul Latif Jameel Poverty Action Lab*. Retrieved from: https://bit.ly/3g6ggfk.

Barro RJ, Ursua JF, Weng J (2020) The Coronavirus and the Great Influenza epidemic lessons from the "Spanish Flu" for the Coronavirus's potential effects on mortality and economic activity. *AEI Economic Policy Working Paper Series*. Retrieved from: https://bit.ly/2ZfVJic.

Brainerd E, Siegler M (2003) *The economic effects of the 1918 influenza epidemic*. Discussion Paper Series 3791. Centre for Economic Policy Research. Retrieved from: https://bit.ly/3cOlYAg.

Correia S, Luck S, Verner E (2020) *Pandemics depress the economy, public health interventions do not: evidence from the 1918 flu*. SSRN. Retrieved from: http://dx.doi.org/10.2139/ssrn.3561560.

Eichenbaum MS, Rebelo S, Trabandt M (2020) *The macroeconomics of epidemics*. NBER Working Paper 26882. National Bureau of Economic Research. Retrieved from: https://bit.ly/2za61pu.

European Commission (2020a) *Tourism and transport in 2020 and beyond*. COM (2020) 550. Retrieved from: https://bit.ly/2zMXRmU.

European Commission (2020b) *Communication from the Commission: Covid-19 - Towards a phased and coordinated approach for restoring freedom of movement and lifting internal border controls*. C(2020) 3250 final. Retrieved from: https://bit.ly/2LESxVh.

European Commission (2020c) *Covid-19: guidelines on the progressive restoration of transport services and Connectivity*. C(2020) 3139 final. Retrieved from: https://bit.ly/3bI9sRt.

European Commission (2020d) *Commission recommendation of 13.5.2020 on vouchers offered to passengers and travelers as an alternative to reimbursement for cancelled package travel and transport services in the context of the Covid-19 pandemic*. C(2020) 3125 final. Retrieved from: https://bit.ly/3cW2Lgh.

Fan VY, Jamison DT, Summers LH (2015) *The inclusive cost of pandemic influenza risk*. NBER Working Paper 22137. The National Bureau of Economic Research. Retrieved from: https://www.nber.org/papers/w22137.

Garret TA (2007) *Economic effects of the 1918 influenza pandemic: implications for a modern-day pandemic*. Federal Reserve Bank of St. Louis. Retrieved from: https://bit.ly/2zUHHYz.

Hanewald K (2011) Explaining mortality dynamics: the role of macroeconomic fluctuations and cause of death trends. *North American Actuarial Journal* 15(2): 290–314.

Jones P, Comfort D (2020) The Covid-19 Crisis, Tourism and Sustainable Development. *Athens Journal of Tourism* 7(2): 75–86.

Jordà Ò, Singh SR, Taylor AM (2020) *Longer-run economic consequences of pandemics*. Working Paper 2020-09. Federal Reserve Bank of San Francisco. Retrieved from: https://doi.org/10.24148/wp2020-09.

Kalemli-Ozcan S (2002) Does the mortality decline promote economic growth? *Journal of Economic Growth* 7(4): 411–439.

Ma C, Rogers JH, Xhou S (2020) *Global economic and financial effects of 21st century pandemics and epidemics*. SSRN. Retrieved from: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3565646.

Meltzer M, Cox N, Fukunda K (1999) The economic impact of pandemic influenza in the United States: priorities for intervention. *Emerging Infectious Diseases* 5(5): 659–671.

Niu G, Melenberg B (2014) Trends in mortality decrease and economic growth. *Demography* 51(5): 1755–1773.

Organisation for Economic Cooperation and Development - OECD (2020) *Tackling Coronavirus (Covid-19), contributing to a global effort: tourism responses*. Retrieved from: https://bit.ly/3dWP8gM. [Accessed 18 May 2020].

Papanikos GT (2000) *The Greek small and medium sized hotel enterprises*. Athens: Research Institute of Tourism. (In Greek).

Papanikos GT (2001) *Regional analysis of Greek hotels*. Athens: Research Institute of Tourism. (In Greek).

Papanikos GT (2002) *Employment in the accommodation sector*. Athens: Research Institute of Tourism. (In Greek).

Papanikos GT (2005) *The Greek tourist receipts*. Athens: Research Institute of Tourism. (In Greek).

Papanikos GT (2020) Thucydides and the synchronous pandemic. *Athens Journal of History* (forthcoming): 1–26. Retrieved from: https://bit.ly/2z9YvLh.

Rasul I (2020) The economics of viral outbreaks. *American Economic Association: AEA Papers and Proceedings* 110(May): 265–268.

Swift R (2011) The relationship between health and GDP in OECD countries in the very long run. *Health Economics* 20(3): 306–322.

World Bank (2017) *From panic and neglect to investing in health security: financing pandemic preparedness at a national level*. Washington, DC: World Bank Group.