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Master's Dissertation

Risks in the Tourism Sector from the Increase in Energy Prices

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Supervisor

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Abstract

Real energy price behavior over time shows that levels fluctuate abruptly and regularly. By the end of the first quarter of 2022, the price of crude oil had doubled, that of coal had tripled, and that of natural gas had risen by more than five times compared to early in 2021. This present dissertation pertains to how the higher prices of energy commodities have affected the tourism industry, from the viewpoint of tourists as well as lodging businesses' managers, examining the current energy crisis as experienced in 2022. Both a qualitative and a quantitative analysis was used to extract safe and well-rounded results. Two clusters of participants were needed. One regarding the tourists (individuals) and one in regard to the accommodation managers, with the total number of the former being 183 and 13 for the latter. Initially, after the collection of the questionnaires, a descriptive analysis was conducted, producing graphs and useful aggregates, which needed further analysis. The second step was the correlation analysis using a matrix of all usable data of each questionnaire, observing this which set of variables present high or moderate relationships. The last measure of analysis was the regressions. For both sets of data, three models were created and used. All models were found to be significant, with high R-square and low F-significance. The results show that no major financial risks were detected in regard to the revenues of the touristic businesses, though the individuals appeared to be affected financially due to the higher inflated prices. Furthermore, it is worth mentioning that a minor 20% of participants were willing to sacrifice their vacation or trips in order to save money from. Despite the fact that both individuals and businesses were impacted by the energy crisis, resilience can be shown in the tourism industry's ability to rebound, especially from the financial effects of the inflationary energy crisis. Last, it is also necessary to note that sustainable energy is a crucial element that governments should start implementing.

<u>Acknowledgements</u>

Contents

Chapter 1

Introduction

Tourism is a highly dependable sector on energy and consequently on its products and byproducts. Moreover, some economies are more reliant on their tourism sector than others. Such economies include but are not limited to Greece, Iceland, Cyprus, Spain, Mexico, Portugal and Croatia to name a few. This dependency rate can be better reflected on the tourism contribution on the GDP. More specifically, in 2019, for the Greek economy, the said index amounted to approximately 20%, being only second to Iceland (22%) (Adamopoulou et al., 2022) Nowadays, the tourism sector may recover faster and appear more resilient to crises, shocks and disasters than previously, due to globalization and accessibility to vacation.

Historically, energy crises and higher prices consequently had a plethora of effects on the overall economy. Higher energy prices have increased the input costs for a number of commodities that are included in the core consumption bundle, which has led to an increase in the core consumer price index (CPI). (Huang and Huang, 2009) Furthermore, because the global trading of oil is a geographic and a political issue, the causes and effects of oil costs will be unequally distributed. Due to its substantial reliance on oil and gas for both production and consumption, Europe has historically seen some of the worst effects of rising oil and energy prices. (Bjørnland, 2022) In addition, the computed welfare consequences show that an increase in food and energy prices would cause either a considerable increase in compensation expenses or a decrease in consumer welfare, which would be especially challenging for households with low incomes. (Huang and Huang, 2009)

Over the previous 20 years, gas prices had been far more stable than oil prices, but this began to change in the second half of 2021. (Gros and Shamsfakhr, 2022b). Regarding the problem with the increase in energy prices in 2021–2022,

inflation is rising as a direct effect of the higher energy prices, which lowers consumer spending. (Hu, 2022)

Due to the severity and recency of the energy crisis, emerging after the first COVID-19 lockdown and deepening after the Russian-Ukrainian war, its results and outcome pose a significant interest in regard to the tourism sector, which was already hurt by the aforementioned event. Therefore, the aim of this dissertation is to study the immediate and emerging risks of the higher energy prices on the tourism sector, as experienced by accommodation managers and tourists, proceeding with research using qualitative and quantitative measures. Additionally, recently, little to no work has been done on the effects of energy prices on the tourism industry from the perspective of both the consumers and producers, thus establishing this study as an innovative one. The principal objective of this work is to unveil in which way and how deeply has the inflationary energy prices have impacted the lodging businesses and how the consumers have reacted to these changes. Using also the literature review, it would be useful to compare how the tourism sector has changed or modified, as well as how robust it appears nowadays, since many conditions have altered overtime (such as technology, accessibility, disposable income etc.).

Chapter 2

Literature review

<u>Energy prices history</u>

In the power industry, in the US, energy expenses make up about one-third of overall costs, compared to an average of 5% throughout the entire economy. (Linn et al., 2014) Energy is a crucial component of production as well as a good for consumption, with very modest demand and substitution elasticity. Rising energy costs immediately contribute to general inflation, and if wages remain stagnant, they may further diminish GNP (gross national product) and employment by raising the marginal cost of production. (Pindyck, 1980) Historically, real energy price behavior indicates that levels change frequently and unpredictably over time. Between 1870 and 1900, when the large-scale production of both commodities began, oil and coal prices both typically decreased. (Pindyck, 1999)

Before shocks struck, certain economies were in vulnerable stages of the business cycle throughout the 1970s, inflation was out of control (even before oil prices surged), and various structural factors made some economies less resilient to price shocks. (Congressional Budget Office, 2006)

The Organization of Petroleum Exporting Countries (OPEC) raised oil prices in 1973, which caused the price of oil to quadruple in a matter of months. At the same time, the Organization of Arab Petroleum Exporting Countries (OAPEC) imposed an oil embargo and reduced production to pressure Western countries and Japan into taking a more pro-Arab stance in the Arab-Israeli conflict, which had been raging for several years. (Bösch and Graf, 2014) Iran, which had

previously exported 10% of the world's oil and ranked second among all exporters, had its oil supply nearly entirely disappear from the market in 1979. Oil prices doubled in a short period of time, setting a new record high. (Bösch and Graf, 2014) Additionally, all three fuels' prices—including the price of natural gas—rose sharply between 1973 and 1981, but by the middle of the 1980s, oil and coal prices had hardly risen over their levels from 30 to 80 years prior, while natural gas prices continued to rise. These costs varied greatly between 1900 and the oil shock of the early 1970s, but they tended to hover around an average of $3,50 per barrel of oil (in 1967 dollars) and $4 per ton of coal. (Pindyck, 1999)

Entering the new millennium, unexpectedly, most state parks in South Carolina, USA, recorded increases in visitors during the period of the rise in oil prices between 2004 and 2008. (Oh and Hammitt, 2011) While the price of jet fuel more than quadrupled from $0.69 per gallon to $2.96 per gallon during the same period, oil prices had almost quadrupled by 2008 from an average of $26.12 per barrel in 2002 to $99.57 per barrel. Despite having decreased from their 2008 highs, the costs of oil and jet fuel in December 2019 were still more than treble those in 2002. (Atems, 2021) The price of crude oil peaked in July 2008 at $147 per barrel, setting a new record since the all-time high of $83 per barrel in 1981 (adjusted for inflation to 2008 prices), while for regular gasoline the price reached $4,05 per gallon, during the same month on July 2008. (Huang and Huang, 2011) (Oh and Hammitt, 2011)

In the last year of the second decade of 2000s, COVID-19 led to lower consumption of energy due to the measures in order to control the pandemic, which led to lower the supply of the energy products. By the recovery of the economies and the lack of measures during 2021, the demand of energy rose again, but met with very low supply. (Hu, 2022) In comparison to early 2021, the price of crude oil had doubled, that of coal had quadrupled, and that of natural gas had more than five times increased by the end of the first quarter of 2022. In the majority of Europe, the weight of energy-related products and services in the CPI (consumer price indices) ranges from 5 to 15%. (Ari et al., 2022) Early October of 2021 saw a 400% increase in gas prices compared to April 2021, largely due to global supply and demand dynamics. Over the same time period,

the price of electricity climbed by 200%, primarily due to the rise in gas prices. (ACER, 2021) A year later, in European Union the annual inflation for 2022 was 11,5%, as of October. In 2021 the annual rate was 4,4%. Moreover, energy (+4.44 percentage) made the largest contribution to the annual inflation rate in the euro area in October. (europa.eu, 2022) As we observe, in 2022 the cost of energy in the EU has risen to all-time highs. The increase in import prices starting in the second quarter of 2021 has an effect on both producer and consumer pricing because the EU imports the majority of its energy. (www.consilium.europa.eu, 2022)

Contrary to the above, other scholars believe that the energy shocks, as of June 2022, are less severe than the oil shocks of the 1970s, but they affect more commodities and last longer. (Bjørnland, 2022)

Last, it is worth mentioning that Diesel and unleaded gasoline 95, as types of energy fuels, are typically more expensive in tourist-oriented municipalities than in non-touristy ones. (Ordóñez-de-Haro et al., 2019)

Causes of increase in energy prices

The cause of the price increase between 2003 and 2006 has been a combination of high demand and low supply. (Congressional Budget Office, 2006)

Large fluctuations in crude oil availability and price were the primary cause of energy price shocks until 2021, whereas natural gas prices were much more stable, generally following oil prices with a slight lag caused by indexation in long-run gas delivery contracts. While crude oil prices are only slightly higher than the historical average, gas prices have fallen from the summertime peaks but have stayed above six times the pre-war average as we approach the end of 2022. (Gros and Shamsfakhr, 2022a)

Energy price increases are primarily driven by increases in gas prices globally, in 2021, but a variety of secondary factors also played a role in Europe, including rising coal and carbon prices, high demand, weather patterns, low renewable generation, declining domestic gas production, and some gas supply constraints

brought on by maintenance and a lack of investment in new production. (ACER, 2021)

Following the COVID-19 pandemic and rising global demand, the spike in wholesale energy costs that is associated with it began in 2021 (consilium.europa, 2022). The rise in oil prices began after the world's economy began to recover in 2020–2021, when lockdowns were lifted, and continued with rising geopolitical tensions and the eventual conflict between Ukraine and Russia in February 2022. The latter led to strict sanctions in Russian products, while at the same time Ukraine was unable to provide domestic products. (Bjørnland, 2022) Moreover, holding a 35% market share, Russian energy corporation Gazprom is the largest gas provider to the European market, making supply for gas even more elusive in Europe. (ACER, 2021) Both the Russian-Ukrainian war in conjunction with the climate change have made things worse. (www.consilium.europa.eu, 2022)

 In several European countries, inflation rates reached double digits as a result of the steep rise in the price of imported fuels, which also contributed to a sharp rise in overall consumer costs. (Ari et al., 2022) The same issue is to blame for rising energy prices and choked supply chains everywhere, but due to unsustainable demand growth, supply has remained stagnant. (Hu, 2022) More specifically, due to high transportation costs and a lack of flexibility, natural gas prices vary greatly between jurisdictions. Spot prices in Europe and Asia can have strong correlations. However, US prices are protected from repercussions because the US is a net exporter thanks to plentiful shale gas production, but export capacities are constrained - at least in the medium term. As a result, the US market, where immediate costs are currently about ten times cheaper than in Europe, is protected. (Gros and Shamsfakhr, 2022a)

The effect of rising gas prices on inflation has differed greatly between the two sides of the Atlantic for a variety of reasons, one of which being the above. Another factor is the merit order mechanism for the electric power market, which determines the cost of electricity by using the most expensive source, and links wholesale electricity prices to the price of natural gas in the euro area (i.e. its marginal cost). As a result, European electricity prices have increased while US prices have remained the same. (Gros and Shamsfakhr, 2022a)

In theory, it is impossible to trade in electrical power between continents. However, power prices in Europe are significantly more influenced by global trends than those in the US due to the price of gas (or coal), a tradeable commodity (or most of Asia, where household prices for gas and electricity are highly restricted and disconnected from worldwide prices). The substantial variations in energy's contribution to inflation reflect this. (Gros and Shamsfakhr, 2022a)

Furthermore, the EU itself exhibits a great deal of variation. The domestic gas and electricity rates are governed at the federal level, which is the cause. Prices for consumers do not necessarily increase in direct proportion to price augmentations in the electricity wholesale market (which is interconnected across EU Member States). Thus, the cost of electrical power for consumers varies significantly across the EU. Consumer tariffs in certain nations were based on wholesale costs. Certainly, there was a far closer correlation between retail and wholesale costs in these nations. (Gros and Shamsfakhr, 2022a)

Regarding this recent energy crisis, natural gas costs have affected the euro area differently than other developed economies for two reasons. First off, the price of (wholesale) natural gas has increased significantly less in the US than it has in the eurozone. This is due to the fact that the US supply has not been impacted, maintaining a relatively stable domestic supply-demand equilibrium. Additionally, the US's ability to export liquefied natural gas (LNG) is constrained in the short term (approximately 10% of total domestic supply), which illustrates why an increase in exports hasn't been able to close the enormous price gap. Second, the merit ordering process for the electric power market, which determines the price of electrical power by the most expensive source, links wholesale electricity prices in the euro area to the price of natural gas (i.e. its marginal cost). This is one of the factors contributing to the rise in electricity rates in Europe while they remain unchanged in the US. Another factor raising energy prices in Europe is the euro's depreciation. However, this element is of secondary consequence due to the euro's slight decline (less than 20%) against the US dollar (USD). (Gros and Shamsfakhr, 2022b).

Effects and consequences of increased energy prices in economy

While the short-term effects of energy costs on inflation are widely understood, it is a priori challenging to predict how increasing energy prices would affect core inflation. On the one hand, the core consumer price index (CPI) is rising as a result of higher energy prices, which increase the input costs for a variety of commodities that make up the core consumption basket. Thus, a positive impact on core inflation could result directly from increasing energy prices. Contrarily, one should anticipate an inflation-targeting central bank to maintain overall CPI inflation, which suggests that a larger energy contribution to inflation necessitates a lower contribution from core prices. This mechanism could only function in an indirect manner by diminishing demand as a result of the central bank's policy response, which in turn reduced total price pressure. However, that can require more time and not be apparent right away, for example, in quarterly data. (Gros and Shamsfakhr, 2022b).

The New Keynesian Phillips Curve theory, which dominates central banks, suggests that domestic factors like the output gap and inflation expectations should be the key determinants of core inflation, putting aside energy prices and their possible direct and indirect effects on core inflation. But as more items are imported as a result of globalization, research has been done to determine the relative importance of the gaps in global and national output in driving domestic inflation (usually in a Phillips curve framework). (Gros and Shamsfakhr, 2022b).

Contrary to financial asset prices, oil prices do not immediately react to domestic macroeconomic news. (Kilian and Vega, 2011) The causes and effects of oil costs will be unequally distributed because the worldwide trading of oil is both a geographic and a political issue. Only a few number of nations—most notably those in the Middle East—produce oil, which is mostly consumed by the West and, to a rising extent, China and India. (Becken, 2011b)
Following oil supply shocks, there is evidence of heterogeneous effects across areas, with Asia being the least negatively (and occasionally favourably) affected, followed by the US and Europe. (Bjørnland, 2022) An increase in the energy

price disparity between two countries within a given sector results, on average, in a 0.2% rise in imports, which is statistically significant but has no impact on bilateral exports. Trade in energy-intensive sectors is more impacted by variations in energy prices. (Sato and Dechezleprêtre, 2015)

Oil exporting nations like those in the Middle East, Australia, Canada, Norway, Russia, and, to a lesser extent, Brazil, are less vulnerable than oil importing nations (i.e., the majority of Western nations that serve as tourism source nations). But it was also discovered that while oil-exporting nations could gain in the short term from higher oil prices, their economies would also suffer in the long run as a result of a weaker global economy. (Becken, 2011a)

Europe has historically seen some of the worst effects of rising oil prices, most likely as a result of the region's heavy reliance on oil and gas for both production and consumption. Due to supply shortages or geopolitical unrest, an increase in oil prices of 10% typically results in a two-year reduction in GDP of 0.5% in the euro area. Shocks to the price of oil have raised inflation. (Bjørnland, 2022)

Oil prices are characterized by price shocks that not only have an impact on consumer spending but also on overall economic growth. (Huang and Huang, 2011) Price spikes for oil and gasoline often result in increased pressure on unemployment and inflation. (Oh and Hammitt, 2011) The impact of such a sharp rise in oil costs is detrimental to both the social and commercial competitiveness. The inflation caused by the increased oil costs has social repercussions because it lowers household incomes. (Mariotti, 2014) The cost of living can be significantly impacted by rising oil and fuel prices, not just for luxury goods and services like cruise ship tours and international travel, but also for basic necessities like quick day trips to nearby or state parks. (Oh and Hammitt, 2011)

Additionally, rising oil costs will cause inflation, have an impact on currency rates, and lower consumer incomes. According to several studies, the link between oil prices and GDP has been deteriorating since the 1980s and is influenced by a country's trading partners as well as the type of shock—whether it is supply or demand-driven, slow or fast. Social effects of decreased economic

activity include unemployment, altered purchasing patterns, and altered social norms. (Becken, 2011b)

The price elasticity of energy during the study for data from 1960 to 2006 is inelastic (0.0840), which means that on average a 10% rise in the price of energy would decrease its amount required by 0.84%. (Huang and Huang, 2011) As a result, up until 2006, rising energy costs in the US slowed economic expansion. Consumer price inflation began in 2005, and profits for the industries that produce energy also shot up. Expenditure more on petroleum imports, which often results, in less spending on domestic products and services, was a short-term effect of price increases (2004–2006). Real household income growth was severely restrained by the rise in energy prices, and imports of petroleum and energy both saw significant increases in spending. Although it is doubtful that the rise in energy prices between 2004 and 2006 affected productivity, long-term growth however is lower due to the need to reallocate resources. (Congressional Budget Office, 2006)

In the short term, even a minor rise in energy demand or a decline in the amount of energy on the market might result in a very significant increase in energy price. According to the calculated welfare impacts, an increase in the price of food and energy would result in a significant increase in compensated expenses or a loss in consumer welfare, which would be particularly difficult for households with low incomes. (Huang and Huang, 2009) Since consumers and manufacturers must pay more for imported energy goods and energy-related supplementary products, higher energy prices often result in higher production costs and inflation, which reduces total demand. (Bjørnland, 2022) Manufacturing enterprises are the first to experience the effects of higher energy prices, but in some sectors, consumers are responsible for bearing nearly 90% of the overall shift in input costs. This outcome is the result of producers' ability to more than fully reflect changes in input prices in output prices. Producers in other industries, particularly those with elastic demand, are more affected by changes in input costs. (Ganapati et al, 2016)

The experiences of the previous ten years, according to Blanchard and Gal (2007), show that oil prices do not constitute a substantial cause of economic

variations. They discover that there are at least four causes for the recent rise in oil prices' more moderate impacts on inflation and financial activity: (A) good fortune, (B) a lower proportion of oil in production, (C) more dynamic labor markets, and (D) advancements in monetary policy. (Korhonen and Ledyaeva, 2010)

Russia benefits from oil price volatility both in short and long terms since it is a net oil exporter. A 50% rise in the positive oil price growth rate in the present quarter results in 12.6 and 8.52 % rises in cumulative GDP after 4 and 20 quarters, correspondingly. This positive effect is also rather significant. Although it is negligible compared to the beneficial direct effect, the indirect influence from the significant trading partners is adverse, as was predicted. Indirect effects between nations are typically quite minor. The matrix does contain some intriguing patterns, though. First, as might be expected, Russia's indirect effects on its trade agreements are largely beneficial. The biggest ones have an impact on Finland and Switzerland. Given that Germany is one of Russia's biggest commercial partners, it is unexpected that Russia has the substantial adverse indirect impact on Germany. In contrast, as it would be predicted, the indirect consequences of a rise in oil prices in other nations on Russia are generally negative. The USA has had the biggest detrimental impact, while China has had the biggest beneficial impact. Given that China's growth was quite robust throughout the study period, independent of the level of oil prices, this beneficial effect may be a data artifact. This rapid expansion can also have a beneficial indirect effect on Russia. (Korhonen and Ledyaeva, 2010)

Regarding the 2021-2022 energy price rise situation, inflation is rising as a direct result of increased energy prices, which reduces consumer expenditure. As a result, diminished purchasing power can hinder and impair economic expansion. (Hu, 2022)

By September 2022, the energy price ratio was 40% higher in the euro area than it had been the previous year, compared to 20% in the US and somewhat higher in Switzerland and Japan. Energy has undoubtedly been a lot bigger factor in the euro area's inflation than it has been elsewhere. This period is different due to

the natural gas price's remarkable rise, which has had a different and significant influence on the euro area. Gas prices had been far more constant than oil prices over the past 20 years, but this started to shift in the second half of 2021. (Gros and Shamsfakhr, 2022b).

Tourism sector

More than 250 million people were employed in the tourist industry, in 2020, which accounts for every 12th worker worldwide. It generates 5% of all tax income, 11% of worldwide consumer expenditure, 7% of overall investment, and 33% of global trade in services. (Kyrylov et al., 2020) In 2018, the travel and tourism industry experienced a 3,9% growth. (Usman et al., 2020) To gain perspective, in China, the tourism industry provided $424,5 billion (or 3,29%) of the country's GDP and 3,64% (28,25 million jobs) of all employment in 2017. (Meng et al., 2020)

There are four key industries that make up the tourism industry: transportation, lodging, ancillary services, and sales and distribution. More specifically, there are three types of transportation: air, water, and land. There are two types of lodging: service and self-catering. Included under ancillary services are events and attractions, including food and beverage. Last, travel agents and tourism organizations are included in sales and distribution. (Camilleri, 2018)

In order to increase their market share and profitability, tourist enterprises have expanded quickly on a global scale as a result of the globalization of the industry. (Ritchie, 2004) The expansion of the economy, the enhancement of the welfare of the populace, and the country's ability to compete on the world stage all depend on international tourism, which is a product of the process of global development and integration. (Kyrylov et al., 2020) However, because globalization is frequently perceived as being complicated and chaotic, this process has also exposed corporations to a greater range of "global hazards" associated with operating businesses at such a scale. As a result, the tourism industry is extremely vulnerable to outside influences and pressures in the larger operational environment. (Ritchie, 2004)

The majority of tourists traveling abroad arrive from industrialized nations,

especially Europe (57.8% of all international travel). Although "North-South" travel accounts for just approximately 11% of all international travel, some locations, such as the Caribbean islands, where tourism accounts for around 20% of the national GDP, rely heavily on these flows. (Becken, 2011b) Today's tourism model is reliant on the availability of oil. Previous research has shown that due to the intrinsic transport component, the tourism industry is fuel-driven and very energy-intensive. (Becken, 2008) If rising oil prices have an influence on the main nations of origin, either economically or socially, these tourist flows will change. Higher oil costs may also have a negative impact on the anticipated expansion of emerging markets like China and India. (Becken, 2011b)

In a history throwback, the effects of the oil shocks between 1973 and 1990 on the world economy were explicitly stated. The price of oil skyrocketed but gradually started to fall. Consumer behavior in each instance was proven to be consistent. The rises in the price of oil didn't directly affect how much money was made through foreign travel. In each case, the indirect effect was seen as economic growth rates slowed due to the inflationary impact of energy prices. Consumer spending was declining, which had a negative impact on travel demand and led to slow or negative growth in international travel. (Yeoman et al., 2007)

In 2002, the estimated total energy consumption for the tourist industry worldwide was 14,080 PJ (power joules). 94 percent of this sum is allocated to the transportation sector. (Katircioglu, 2014) In addition to its transportation needs, the tourist industry as a whole largely depends on oil for many other aspects of its product, such as lodging, leisure activities, and hospitality. (Becken, 2011a) More specifically, 3.5 percent of the total sum is allocated to lodging, and the remaining portion to the activities sector. (Katircioglu, 2014) Energy use will rise as a result of tourists' increasingly diverse activities in order to suit their varied needs. (Zhang and Zhang, 2020)

In 1992, visitor spending amount ($9,5 billion from 6,5 million visitors) represents 32.6% of Hawaii's gross state product, more than double its equivalent ratio of 15.83% in 1972. Moreover, up to 40% of Hawaii's total energy demand is absorbed by the sector both directly and indirectly. According to the information at hand, Hawaii's energy demand is mostly driven by the

transportation industry. Since 92% of Hawaii's energy needs are met by imported petroleum, it is plausible that a lack of particular fuel types in industries that rely heavily on tourists could have a negative impact on how competitive such industries are. The whole demand for gasoline and other fuels (such as diesel fuel, residual fuel, liquefied gas, bagasse, and hydropower) increased at an average rate of 2% per year from 1977 to 1987, for Hawaii, whereas the total demand for electricity and aviation fuel increased at an average rate of 3% per year. A demand reaction to increased power and fuel prices is one explanation for these changes. (Tabatchnaia-Tamirisa et al., 1997) As mentioned, transportation, is an important part of energy consumption for the tourist sector. In Spain, in 2014, 18,4% of foreign visitors and 84% of domestic visitors used cars to reach their destination. Moreover, in peak season, a 10% increase in the number of visitors results in a 3,4% rise in the consumption of diesel or gasoline. (Ordóñez-de-Haro et al., 2019) The GCC (Gulf Cooperation Council) nations' income from higher oil prices enhances the spending power of tourists from those nations, being exports for energy goods. Additionally, a sharp decline in outbound tourism was observed due to fluctuating exchange rates and rising air transportation expenses. The findings indicate that the outputs of tourism-related shares of transport sectors declined most dramatically as a result of a decline in demand for travel-related services. (Loganathan et al., 2018)

Germany spent the most on tourism in 2004 ($71 billion), and it is thought that its sensitivity to oil is relatively modest. The United States has a lower score for oil vulnerability despite being the top travel spender. Korea and India, on the other hand, are oil-vulnerable nations, but because they account for substantially less of the world's tourism spending, their economic effects from decreased travel will be less severe. (Becken, 2011b)

Hospitality sector

From an expenditure perspective, the lodging service is elastic. It implies that lodging may occasionally constitute a "luxury good". (Petricek et al., 2020)

The demand for hotel rooms in the United States fell by 1.6% in 2008. With an occupancy rate of 60.4% in 2008, room occupancy fell by 4.4%. In times of recession and high inflation, occupancy rates often stayed below 60% on a 12-month running average basis, staying there for three months or more. (Sheel, 2008)

In all hotel categories, with the exception of upper-upscale and all urban regions, the demand for lodging declines as gas prices increase. The return of tourism indexes decreased as the VIX (volatility index) increased. In both the long and short terms, a rising exchange rate brings down the cost of dining out and lodging. (Usman et al., 2020)

The main utility expense for the hotel industry, accounting for around 60% of overall costs, is energy. (Usman et al., 2020) Moreover, the second greatest expense area for a hotel after labor is energy usage, which accounts for between 3% and 6% of hotel operating expenditures. (Upadhyay and Vadam, 2015) Hotels spend money on energy in areas as: room heating and hot water, air conditioning, lightening (with TV and radio), kitchen, laundry, offices and ventilation, in this order. (Upadhyay and Vadam, 2015) Due to the necessity for space cooling, which is particularly important for countries in southern Europe, higher temperatures (connected to the climate) would have a greater impact on power usage than lower ones. The use of power is significantly impacted by both higher and lower temperatures. (Pablo-Romero et al., 2017) As a result, hotel chains can increase their revenue per available room by charging their customers for energy use. The positive correlation between energy and the occupancy of the rooms and the money they provide is highlighted. (Arenhart et al., 2022) The sector of hotels and restaurants often experiences higher electricity usage as visitor overnight stays increase. (Pablo-Romero et al., 2017) Whether a given hotel site can be reached by common conveyance or if one must drive a private vehicle to get there will likely determine how closely gas costs and room demand are related. (Canina, 2003) Therefore, the cost of transportation is crucial to the development of demand in the accommodation sector. Demand elasticity in relation to gasoline prices is positive (1957-1978 in the US). This suggests that the demand for hotel services across a nation won't decrease in response to increasing gasoline prices, but rather somewhat

increase. The rationale is that the rise in energy prices has a substitution effect on changes in the distribution of travel distances, the length of journeys, and the use of public transit. Due to gas shortages and ongoing price rises in 1979, traditional vacation destinations experienced a significant drop in summer tourism. It is noteworthy that suburban regions at the time were hardly impacted and, in some circumstances, even went through a mini-boom. (Arbel and Abraham Ravid, 1983)

As gas prices rise, demand for hotel products declines. According to statistics, for the period 1988-2000, the demand for hotels decreases by 1.74 percent for every 1 percent increase in petrol prices. (Canina, 2003)

Transportation sector

The largest portion of energy used in tourism is for transportation. (Zhang and Zhang, 2020) Since most transportation is powered by oil, rising gas costs have an impact on outdoor recreation and/or tourism travel, both of which depend heavily on energy. (Oh and Hammitt, 2011) Although positive, the corrected cross-price elasticity of transportation services with regard to the price of automobiles suggests that there is a substitution relationship between them. (Huang and Huang, 2011) As a result, the availability of affordable transportation affects tourist flows around the world. (Becken, 2011b)

Studies on the price elasticity of air travel demonstrate the need to differentiate between different types of travel, including business and leisure, long- and short-haul, and domestic and international. Business and long-distance travel are typically less elastic than other types of travel. Oil prices will have an impact on visitors' decisions regarding where to travel as well as how (extensively) they will travel once they arrive at their destination. (Becken, 2008)

Given the importance of the aviation sector—which will carry over 1 billion passengers in 2019 and produce operating revenues of over $248 billion annually—it is not surprising that changes in oil prices attract major media attention. Oil supply shocks have little effect on the price of oil or jet fuel, whereas aggregate demand and precautionary demand shocks drive up the price of oil and jet fuel steadily. (Atems, 2021) The airline industry, in particular, is

characterized by hedging because making at least some of their fuel purchases in advance eliminates or significantly lowers the danger of unpredictably high price increases. (Williams and Baláž, 2014) In response to shocks to the supply of jet fuel, the number of passengers boarding commercial aircraft declines, and it rises in response to shocks to the demand for jet fuel. Due to the oligopolistic nature of the American aviation market, there is less rivalry, which enables airlines to set ticket rates without paying too much attention to fluctuations in the cost of jet fuel and oil. To give a perspective, despite rising oil and jet fuel costs in 2003 and 2004, the cost of domestic flights actually decreased, primarily as a result of greater competition from low-cost and regional airlines. (Atems, 2021)

Airlines raised the cost of their tickets in 2008 as a result of the rising price of oil, adding fees that might amount to $350 for a roundtrip ticket from the United States to Europe. Long-haul flights have disproportionately high fuel expenditures relative to their operating costs (for example, 30% versus 17% for short-haul flights). Therefore, under high oil price situations, shorter-haul travel will likely replace longer-haul travel in the global tourist flow. Even if certain locations would see a decline in visitors, these scenarios will be advantageous for nations that are close to important source markets (such as Cambodia and China). Global oil production restrictions are anticipated to undercut growth projections of 5% annually for international travel and tourism. Virgin Airlines, which is aware of this issue, participates actively in the UK's Peak Oil Industry Taskforce. (Becken, 2011b)

In 2021 and the beginning of 2022, the cost of jet fuel and crude oil surged sharply, placing additional strain on the budgets of airlines. Global economic activity made a strong comeback in 2021 from the pandemic's depths, steadily increasing demand and oil prices. The crack spread—the difference between the pricing of crude oil and jet fuel—was small at first, but it has widened since mid-2021. Early in 2022, a combination of the Ukraine conflict, a booming global economy, and a lack of crude supply caused crude oil prices to soar. (Walsh, 2022) The COVID-19 pandemic had been going on for more than 2 years, and despite that, air connectivity at European airports is still -29% below 2019

levels. This indicates that as of June 2022, aviation connectivity in Europe is remain at its pre-Great Recession level from 2009. (Jankovec, 2022)

Restaurant (Food & Beverage) sector

Generally, changes in petrol costs have little long-term effect on consumer spending at restaurants. The public transportation index had no effect on restaurant demand in the short-run or long-run for customers who utilize public transit to get there. (Arbel, 1983) In both the long-term and short-term, a rising exchange rate brings down the cost of dining out and lodging. (Usman et al., 2020) However, there is evidence that the rise in gas costs may have had a marginally favorable short-term effect on restaurant sales. (Arbel, 1983) Numerous well-known American restaurant franchises reportedly filed for bankruptcy (chapter 11) in 2008, according to a Reuters report. During that period, not only the US but worldwide, countries experienced recession, causing moreover high inflation. (Sheel, 2008)

The Institute of Tourism conducted the TOMAS survey during the 2019 tourist season to gather information on the opinions and spending habits of visitors to Croatia. Food in restaurants and bars accounts for the second-highest expenditure for travelers after lodging, costing an average of 16.88 euros per day, or 17.24% of daily consumption. The majority of survey respondents—37, or 86%—cited the rise in the cost of raw goods, such as food and beverages, as the primary cause of the price increases in the Croatian restaurant study. The magnitude of the price rise in their eateries was a question that the respondents responded to. More specifically, 11 respondents, or 26% of those surveyed, intend to raise prices by 20% to 29%, while 29 respondents intend to raise prices by between 10% and 19%. (Miljak et al., 2022)

The case of the United States

Since the early 1980s, in US, food price inflation has reached its highest level. While prices for all food (consumed at home and away from home) only make up 14 percent of the CPI for the entire economy, food purchases make up around 12 percent of overall consumer expenditures. Despite making up only 14% of the overall Consumer Price Index, food inflation has a greater impact on lower -

income households because food makes up a larger portion of their entire spending. The year-over-year CPI for food increased 6.3 percent in December 2021, the highest 12-month increase since October 2008. In October 2022, food (alongside alcohol and tobacco) was the second highest contributing factor to inflation, in the Euro area. (Glauber and Smith, 2022)

Interruptions in the food supply chain caused by COVID-19 and increases in the cost of living for workers in the restaurant and food production industries are the main causes of food inflation. The costs of underlying commodities have also been high, but they only make up a minor portion of the money spent on food. As of February 2022, inflation rates for some food groups, such as red meats, ranged from 15 to 18 percent. However, prices for other groups, such as dairy goods, only slightly increased. (Glauber and Smith, 2022)

When domestic and international demand for energy and other items began to increase by the summer of 2020, most crop prices started to increase. Corn, wheat, and soybean prices reached their highest peak since the early 2010s as a result of crop production deficiencies in North America, Russia and Ukraine (wheat), South America (corn and soybeans), and North America. These shortages were exacerbated by strong import demand from China. (Glauber and Smith, 2022)

Animal products' wholesale costs are more inconsistent. As a result of COVID-19-related disruptions, surpluses developed at milk processing and bottling facilities in the spring of 2020, and demand switched from traditional outlets like schools and restaurants to grocery stores. (Glauber and Smith, 2022)

Although much higher retail prices for beef and beef-related items throughout the second half of 2021, prices for slaughter animals have remained largely stable during much of 2020 and 2021. Since mid-2020, slaughter chicken wholesale costs have been rapidly rising; by December 2021, they had risen by approximately 70% compared to pre-COVID-19 levels. Wholesale slaughter hog prices were over twice as high in May 2021 as they were in January 2020, but by the end of the year, they had decreased to levels that were only around 50% higher than those prior to COVID-19. (Glauber and Smith, 2022)

More recent data, in 2022, suggest that Americans are spending more on basic necessities, which is forcing many to reassess their priorities and make changes

like reducing their out-of-home dining, brewing coffee at home rather than going to their favorite coffee shop, expenditure less on non-essentials, and switching to more cost-effective products. Therefore, their decisions may be driven by price over brand loyalty in the face of rising inflation, while others may be completely cutting back and choosing to make coffee at home. (Owayni, 2022)

High end restaurants and fast food franchises are suffering as Americans continue to limit their dining out. Home-cooked dinners, however, aren't always a more cost-effective option (grocery costs increased by 11.9% in the last year). When it comes to cheap dinner options, fast food may be the solution for many Americans. Location data reveals that as more Americans cut back on dining out, casual dining establishments will likely depend more on special occasions to boost traffic. Fast food businesses as a whole have maintained higher foot traffic levels than just one year before throughout June 2022. In contrast, casual dining businesses saw a -5% decline in foot traffic as of June 1 and a -10% decline as of June 30 of this year. (Owayni, 2022)

Recreation sector

Some recreationists could need substitutes that correspond to the same set of needs, interests, and goals as the initial experience. Others may just demand that substitutes guarantee an equally pleasurable experience to the original, regardless of whether the substitute has radically different goals, objectives, or preferences. Others may not even need to be enjoyable as long as other recreation benefits (such improved physical condition) are realized. Recreationists' proficiency in and dedication to an activity, as well as environmental circumstances, have an impact on how readily available substitutes are seen to be. Increased psychological commitment, which narrows the range of possibilities and reduces readiness to substitute outside the favored activity, is manifested in specialization. (Brunson and Shelby, 1993)

During a study on 1978, the sample contained a disproportionately high percentage of recreational vehicles, highlighting the respondents' focus on vacations, even of such a short duration. (Dan Kamp et al, 1979) Perhaps the marginal travelers' demand for leisure travel was more impacted by the rise in energy (and more specifically gasoline) prices, than their demand for necessary

travel, such business trips. (Arbel and Abraham Ravid, 1983)

A more in-depth analysis has been conducted in 1986, and it pertains to the two biggest periods of high energy prices. Between January 1973 and July 1979, the cost of private transportation grew by 31.8%. If all other factors remained the same, the price coefficient predicts that this increase would have resulted in a drop of around 49% in park visitors for U.S. National Parks, based on the model of the current study. The findings unequivocally demonstrate the impact of the energy crisis. All visits to American parks have a small but considerable impact on this effect, but Grand Canyon visits have a much bigger impact. In fact, according to our findings, Grand Canyon visitors decreased by close to 25% during the two economic crises of 1973–1974 and 1979 but were not considerably impacted by escalating transportation costs. According to the Grand Canyon attendance data, there has been a strong trend toward increased usage of public transportation as well as a strong inclination toward switching to it when transportation expenses have risen more generally. (Morgan, 1986)

Consumers' behavior

Only a small section of the world's population can engage in tourism because it is a luxury good. Numerous empirical tourism research demonstrate that income has a significant role in determining leisure travel behavior and distance. As a result, lower income effects brought on by rising oil costs are anticipated to decrease international travel and redistribute flows. Reduced economic activity will probably also lead to a decline in the number of business travelers. Along with affecting income, the cost of tourism affects where consumers visit and the kind of vacations they take. Depending on how sensitive a market is to price changes, demand declines as transportation costs rise. (Becken, 2011b)

Economic consumption models are constructed on a positivist paradigm, where the consumer aims to maximize utility by combining time, money, and resources for products and services. In the setting of quantifiable situational or psychographic variables, research on destination choice characterizes the tourist as a logical and knowledgeable decision maker. As the visitor learns about the

goods and forms an opinion about a particular location, travel costs enter the decision-making process in these models. In a number of studies that expanded on the idea of planned behavior to explain destination choice, attitudes were found to be significant in visitors' decision-making along with subjective norms and perceived behavioral control. Additionally, visitors may form opinions about the consumption of finite resources. The potential effects of increasing oil prices can be partially understood by econometric calculations, but destination selection is a considerably more involved process that takes into account a variety of both tangible and intangible factors. There are unmeasurable elements at play, such as the so-called "Ulysses factor," which causes some types of tourists to feel the need to venture beyond the familiar and so travel farther than other types of tourists. (Becken, 2011b)

In general, rises in natural gas wholesale prices can affect consumer costs directly or indirectly. The increased costs that households pay for gas are what have an immediate impact. Based on fluctuations in the gas portion of the harmonized index of consumer prices, these effects can be approximated (HICP). This component's weight in the HICP is 1.4% for the Spanish economy and 2% for the entire euro area. (Munoz et al., 2022)

Consumer spending may be directly impacted by changes in energy prices through four processes. First, as customers will have less money to spend after paying their energy bills, increasing energy prices are predicted to diminish discretionary income. Second, fluctuating energy prices could make customers hesitant to make permanent purchases of consumer durables by casting doubt on the future course of energy prices. Third, even if consumer choices are reversible, consumption may decline in reaction to shocks in energy prices as people increase their precautionary reserves. Fourth, consumption of durables which require energy to operate will decrease even more than the consumption of other durables. (Edelstein and Kilian, 2009)

The indirect consequences are linked to the higher costs of goods whose production processes involve natural gas or whose costs are highly affected by gas prices. Since gas is typically the marginal energy source utilized in the production of electricity, wholesale natural gas prices obtain an extremely

substantial impact on wholesale electricity prices. Final electricity costs paid by businesses and consumers include both wholesale pricing and pass-through charges. Depending on the laws in existence and the kinds of contracts utilized in each nation's retail energy market, this pass-severity throughs varies. (Munoz et al., 2022)

It is well acknowledged that rising energy costs tend to reduce households' purchasing power since people spend more of their income on energy use and have less money available for other expenditures. (Edelstein and Kilian, 2007) As a result of rising prices, demand declines, which slows the rise in living expenses, from the consumers' standpoint. To put this into numerical perspective, European households spend little over 10% of their entire consumption on energy goods, on average. (Ari et al., 2022) Each person would have annual consumer welfare losses of $242 and $158, respectively, from a 10% increase in food or energy prices, for years 2004-2006. (Huang and Huang, 2011) However, consumer expenditure on non-energy products and services continue to expand quickly. (Congressional Budget Office, 2006) The personal consumption expenditure (PCE) price index for energy commodities increased by 63% in real terms between January 2002 and July 2006. (Edelstein and Kilian, 2009) Changes in the current level of energy prices are likely to affect consumer spending choices across a range of economic sectors, including the hotel sector. (Usman et al., 2020) In times of crises, consumers alter their travel preferences or even postpone their vacations. (Surugiu and Surugiu, 2017) Besides, between 1957 and 1978, more Americans chose domestic travel over international vacations, while more foreign visitors were drawn to the US. (Arbel and Ravid, 1983) People didn't completely postpone their travels as a result of the rise in energy costs. Instead, they swap out their far-off holidays for local excursions. (Arbel and Abraham Ravid, 1983) According to a 2001 study, 19.2 million people, or 14% of all tourists, would cut back on travel or postpone vacations as a result of increased gasoline costs. (Canina, 2003) Further to that, due to their limited time and access to information, travelers who use cars are less sensitive to fuel prices than other types of clients. (Ordóñez-de-Haro et al., 2019)

The widespread idea that the demand for gasoline is rather inelastic was refuted by data showing decreased fuel demand per car and rising gasoline stocks.

Although the price of gasoline rose by 45%–50% over the course of the year, or 4% per month, this rise had no impact on the number of miles travelled. It appears that a scenario of exceedingly inelastic demand predominated. The speculative conclusion is that buyers responded to increasing pricing by downsizing to more economical, lower cylinder cars because they were unwilling to reduce their driving. (Willenborg and Pitts, 1977) In reaction to rising energy costs, consumers initially switch to mass transit, either in their everyday life of during vacationing, but quickly determine that the additional annoyance is not worth the cost savings. (Edelstein and Kilian, 2007)

According to recent surveys, 67% of vehicle travel and 50% of air travel are optional, and around one-third of Americans have adjusted their trip plans as a result of rising petrol prices. All things being equal, according to economic theory, a visitor is less likely to take advantage of a given tourist opportunity the more expensive their travel expenses are. Other influencing factors, such as visitor behavior, tastes, and motivations, might moderate the effect of fuel prices on travel decisions in addition to transportation expenses. The accessibility of comparable substitutes to park visitors is another external element that may have an impact on the direct correlation between gasoline costs and park occupancy. It is possible to think of rising gas prices as antecedent limitations that set off negotiations to reduce the consequences of external constraints on the continuation of travel for tourism and recreation, such as visiting parks. (Oh and Hammitt, 2011) To elaborate more on types of travelers, visitors who were on vacation or were visiting friends and family were more willing to forgo their travel than were business travelers. Conventional passengers did say that, if necessary, they would look for alternative modes of transportation for such journeys. When gas prices reached an intolerable level, nearly half of vacationers said they would remain home rather than take another method of transportation or travel a shorter distance. (Dan Kamp et al, 1979)

In the U.S., a recent study of 2022, found that public's fuel demand has continued despite recent increases in petrol prices. In fact, over the past few months, the amount of foot traffic at gas stations has significantly increased. Despite an increase in gas prices of more than $1 per gallon throughout that period of time, gas station visits were up 10% as of June 1 of 2022 compared to the previous

year. In mid-April of this year, foot traffic to gas stations began to increase even more noticeably, exceeding fast food restaurants' foot traffic increases by a significant margin. (Owayni, 2022)

The case of Germany

Higher crude oil prices on the global market have an immediate financial impact on consumers at the gas pump. These price hikes are virtually always passed on to customers by gas station operators. As of early 2022, the cost of diesel and gasoline is currently 20–25% higher than it was in early 2021. (Heymann and Becker, 2022)

Most individuals and families have not yet felt the full impact of increasing energy commodity prices on electricity and natural gas prices. The explanation is that annual contracts with private residences and utility companies typically include a fixed working price for gas or electricity. Additionally, many energy suppliers often spread out their purchases of the anticipated demands for gas and electricity across time and primarily on the futures market, which tends to smooth out residential energy prices. (Heymann and Becker, 2022)

Producers' behavior

All power producers receive the same price under the "marginalist" system, which is determined by the marginal unit. When the price of the marginal unit (usually set by a fossil fuel power plant) soars, this could result in gains of great size for those technologies that generate energy at a mostly unaltered marginal cost (such as nuclear, wind, and renewables). (Ari et al., 2022)

Due to the increased demand, from 2003 until 2006, some businesses were able to either pass on the higher costs to their customers or make up the difference by slowing the growth of other production expenses. (Congressional Budget Office, 2006) Attributable to the impact of tourists, gas stations find it more challenging to raise prices when the price level is high. (Ordóñez-de-Haro et al., 2019) Moreover, because coal and natural gas prices are adjusted less frequently by

utility companies, the observed pass-through of international crude oil prices to transport fuels has been greater than that of coal and natural gas prices to retail electricity and natural gas prices. (Ari et al., 2022)

Regarding tourist locations, it is wise and relevant for managers to think about their current oil requirements for tourism and plan for a future where oil is unavailable, excessively expensive, or intolerable due to climate change restrictions. Given the scenarios of decreasing oil supply in the future. Reducing the use of fossil fuels in transit to and within the destination is a crucial component of this. At the destination level, there are numerous strategies to help achieve this goal, such as lowering the demand for energy inputs (e.g., passive building), increasing the energy efficiency of the transportation and lodging industries, and promoting the use of renewable energy sources. (Becken, 2008)

Risks in tourism sector

Given that this industry is particularly "sensitive" and subject to a variety of negative influences, by both economic and non-economic causes, risk assessment in the tourism industry is critical. (Štetić, 2012)

When going abroad, travelers face five different types of risks. These include the risks associated with one's health, criminality, accidents, the environment, and natural disasters. Furthermore, in the tourism sector, uncontrolled hazards are seen as being more significant than controlled ones. Finally, it is possible to systematize and forecast risks in the tourism sector by taking advantage of the technological means. (Kyrylov et al., 2020)

Further to this, as Carballo mentions that there are nine broad categories of risk are connected to traveling: financial, health, physical, political unpredictability, psychological, satisfaction, social, terrorism, and time. Security and safety are essential to the tourism sector. General dangers like crime, illness, and natural catastrophes can affect both visitors and locals at a site. However, there are other risks as well, such as those brought on by cultural differences, modes of transportation, the attitude of locals, inclement weather, strikes, inadequate sanitation, and ambiguity over local rules and regulations. (Carballo et al, 2017)

There is a high level of susceptibility to exogenous, non-systematic risks like sociopolitical and natural disasters. As a result, risk is a part of tourism on all

scales, from the person to the group to the destination and the national levels. The risks that businesses confront range from the "regular" operating risks associated with competition, manufacturing, and distribution, or systematic risks, to the unusual unsystematic risks provided by exogenous occurrences, such as a world economic crisis, a military coup, or an earthquake. Some components are unique to tourism. One of these is the possible increased significance of outside shocks (like riots) given the discretionary nature of tourism spending. In addition, the "uno-actu-principle," which states that supply availability is highly time-specific, requires that hotel rooms or airline seats be sold for a certain time period and cannot be delayed. Furthermore, unsystematic risks, which result from market volatility brought on by exogenous dangers like economic recessions, cannot be prevented. (Williams and Baláž, 2014)

The aviation sector is particularly vulnerable to the environment of external operating risk, or systematic risk, which is caused by numerous uncontrollable external causes. The way operating and financial pressures are controlled has a significant impact on the effectiveness of systematic risk management. For airline firms, reducing operating expenses may be a beneficial strategy. One of the main issues with airline cost control is the cost of fuel. Fuel hedging is advised to stabilize the volatile fuel price. (Lee and Jang, 2007)

The risks posed by "peak oil" have only been addressed in a very small number of regions or locations. This may be due to the fact that global dangers are more ephemeral than more pertinent and immediate local risks. However, oil prices are anticipated to increase production costs and drive up the price of tourism-related goods, which will ultimately, depending on the elasticity of demand, lower tourism-related output. (Becken, 2011b)

The tourism business is frequently adversely affected by outside political, economic, social, and technological variables that are frequently out of its direct control. Employee strikes, terrorist attacks, economic downturns, conflicts, and natural disasters are a few dangers in the tourism industry. (Ritchie, 2004)

Moreover, the World Tourism Organization claims that "human and institutional environment outside the tourism sector" is the source of risk in tourism related to energy and its prices. (Štetić, 2012) Therefore, policymakers are frequently interested in quantifying risks, for instance by analyzing a country's dependence

on oil and how it affects tourism. The degree to which a country is vulnerable to oil price volatility depends on a number of variables, including the proportion of oil costs to gross domestic product, the intensity and efficiency of oil use in production, the labor market's flexibility, the value of domestic reserves relative to oil consumption, the risk of geopolitical oil market concentration, market liquidity, and the accessibility of alternative energy sources. (Becken, 2011b)

It is important to note that there are times when government officials in the tourism industry are unable to find and put into place crisis management strategies. Political and legislative uncertainty and instability can have a significant influence on industries like tourism. (Surugiu and Surugiu, 2017)

Renewable energy-future

Long-term, it is hoped that the switch to renewable energy sources would result in a plentiful and affordable energy production (due to ultimately low marginal costs of renewable energies). Uncertainty exists around whether and when we might enter a new energy universe. More traditional energy source diversification could, for the time being, aid in reducing market imbalances. Russia is currently Germany's single largest energy supplier, providing more than 50% of its natural gas and more than a third of its mineral oil. Because of the depletion of North Sea gas reserves, Russia now accounts for a larger portion of all German gas imports. (Heymann and Becker, 2022)

Given the expansion of LNG infrastructure, the world's gas markets are anticipated to diversify over the coming years (Liquified Natural Gas). The previous several years have seen an upsurge in the global commerce of LNG. (Heymann and Becker, 2022)

Chapter 3

<u>Methodology</u>

Research design

For the purposes of the research, two separate survey questionnaires were compiled. The first questionnaire, consisting of 41 questions, was addressed towards the general public as tourists. In regard to the second questionnaire, consisting of 23 enquiries, it was addressed toward hoteliers and/or other types of lodging businesses. The first questionnaire was completed by a random sample of 182 people, while the second one by 13 accommodation businesses' managers. Finding individuals who reflected diversity in terms of race and gender was the sampling's primary aim.

Questionnaires

The tourists' survey comprises of 25 multiple choice questions as well as 16 open-ended enquiries. Regarding the lodging businesses' survey, the questionnaire consists of 5 multiple choice and 18 open-ended questions, respectively. These inquiries are divided into two and three major areas, correspondingly. It is worth noting that there are multiple questions which are common in the two questionnaires. This way the results may be compared from both, and extract better and safer conclusions. The table below displays the breakdown of the enquiries for each category.

Tourists' questionnaire breakdown

Questions'	Part	Type	Brief

number			description
1-7	A	Demographic features	This section's enquiries are formulated to determine the respondents' age, income, gender, as well as other demographic characteristics.
8-41	B	Main questionnaire	This section's enquiries are formulated to determine the effects, changes, and generally more details regarding the tourism activity of the participants, over a three-year time period.

Table 1

Questionnaire's enquiries analysis

Part A: Demographic questions

Generally, demographic questions help establish the tourists' or customers' profiles, determining this way their needs, habits and approaches. Moreover, by understanding one's background, an analyst may extract more accurate information of the people's values, patterns and practices.

1. Country of origin:

Ethnicity and origin display the cultural background of the participants.

Besides, every country and region, as do plenty individuals, present unique conditions and circumstances, which may lead to different reactions, as well as affect them.

2. Gender:

The impacts of social status, community size and college major on sex role attitudes are all constrained by gender, which also explains more variation in sex role attitudes than any other predictor. (Martin et al., 1980)

3. Age:

The age group is an important demographic question in this questionnaire, as all groups should be represented in the sample, in order to deduce a safe result, which would be representative of all participants, as well as inclusive of all ages. Moreover, by studying variables like age and gender, socioeconomic trends and conditions are also highlighted.

4. Income:

Another variable which needs to be representative of the whole population is income. Inclusivity is therefore necessary in order to elicit accurate results, as well as to study the reaction of the participants under different circumstances and conditions, like income. Divergent reactions regarding socioeconomic conditions, as economic robustness or the lack of offers different perspectives, is expected to be noticed.

5. Occupation:

Employment apart from an economic resource may as well offer psychological motives, like self-confidence. A stable occupation provides financial security. Therefore, one can act or react in a consistent and coherent way, in any aspect of one's life. Moreover, unemployment also offers an inside into the possible reaction of the unemployed individuals.

6. Occupation sector:

Both the public and the private sector offer advantages and disadvantages for its employees. That being said, undoubtably the public sector, due to its nature, provides more stability. Moreover, regarding the private sector, it was the one who was mostly financially affected and therefore its employees,

during both the COVID-19 period and the energy crisis. (Olczyk and Kuc-Czarnecka, 2021)

7. Education:

The level of education is an important variable as (usually) higher level of education entails the type of the profession as well as the salary of the individual. In addition, higher level of education makes people more concerned with social welfare and hence behave in a more ecologically friendly way. (Meyer, 2015)

Part B: Main questionnaire

For the majority of the open-ended questions in this second part of the questionnaire, the enquiries were separated into a three-fold. More specifically, the threefold pertains to the three time periods, i.e., the years 2021, 2022 and 2023. This way we would like to examine the past (2021), the present (2022) and the future (2023), in order to compare the effects and impacts of the higher inflated energy prices.

8.-9.-10. Days of summer vacation:

Posing the same question as a three-fold, through the answers, perspective of the average days of summer spend on vacation is gained. This way the days can be quantified and any changes between the years may be compared, as well as to better understand if the energy crisis (which became evident in 2022) or the COVID pandemic affected the days of vacation of the participants.

11.-12.-13. Family members:

A family, especially to the event of consisting of multiple members, is expected by definition to have more expenses than an individual or a couple vacationing. That is because a family is more likely to have a common fund. Moreover, by quantifying this variable, it becomes noticeable if an individual chooses to spend their vacation with family or otherwise. Furthermore, the results may demonstrate if the energy crisis as well as the COVID-19 crisis have altered or changed the family members one is choosing to vacation with.

14.-15. Vacation habits:

Using this open-ended enquiry, we expect from the participants to share the changes they have observed in their vacation habits from the 2021- 2022 summer period, in addition to their anticipation for the upcoming summer season of 2023, so changed between summer of 2022-2023. These habits could pertain to 1) changes in prices the individuals have encountered and their reaction to those, 2) possible restrictions they faced during the 2021-2022 period, or the lack of (due to the lift of the measures of COVID-19), 3) change in vacation status, due to work or other issues faced by participants, 4) change in destinations, accommodations or otherwise.

16.-17.-18. Travel expenditure:

By posing a question like this the average travel expenditure is being quantified. Moreover, by using the three-fold type of past (2021), present (2022) and future (2023), the real change between the years unveils itself. As prices rise due to inflation rate, it is expected from the individuals to react to them. Certainly, other factors play significant role regarding summer vacation and the public's choice in relation to them. Additionally, during the year 2022, it has been observed an alarming increase in energy prices, which consequently may lead to increases in energy products in sectors like transportation and accommodation, among vacation products.

19. Change in tourism due to COVID-19:

The COVID-19 pandemic has majorly and undoubtably affected the tourism activity over the past three summer seasons, i.e., 2020, 2021 and 2022, with the first being a disastrous season for the majority of the countries. (Zhang et al., 2021) For this question, the individuals are being asked about the change in tourism activity from their point of view, in order to come to a safe conclusion. This scale is designed to cover and reflect a large spectrum of opinions and views, as each person experiences a specific circumstance and condition in different ways.

20. Travel package vs independently:

Booking a vacation is a personal matter, therefore every individual may choose to either book their summer vacation by themselves or alternatively via a travel agent. Oftentimes, booking independently offers a more personalized experience

and flexibility. On the other hand, booking a travel package offers peace of mind and external planning. Additionally, a choice like this depends also on the type of vacation one wishes to have.

21.-22.-23. Other days off (besides summertime):

When examining this enquiry, one should contemplate that certain individuals may not vacation during the summer period for a multitude of reasons, ranging from work to budget or health-related issues. Therefore, the results of this question will be examined in a three-fold way, once again, for continuity purposes. Furthermore, by analyzing these questions a pattern may emerge, as well as if individuals are in position to distribute their budgets accordingly.

24.-25.-26. Accommodation:

A significant portion of one's budget goes directly for accommodation. Using a multiple-choice question, the popularity of which lodging type is being examined and determined. The three-fold period question, regarding the past, the present and the future is being used. Moreover, any changes in taste or choice occurred is being ascertained.

27.-28.-29. Transportation mode:

Another important segment of vacation budget is targeted towards the mean of transportation to and from a destination. Posing the multiple-choice question for the three time periods, like in the accommodation enquiries, this assists in order to examine and preference and/or change. Last, it is being examined if any change occurred due to the increase in prices.

30.-31.-32. Eating out:

An additional part of a tourist's budget while vacationing undoubtably goes to nutrition. Posing this enquiry, i.e., where did they choose to eat out, the preferences of the participants are being scrutinized, as well as their eating patterns and habits. It is also appealing to examine any shift in their preferences over the time period defined, as overall inflation consequently led food and energy-related products and services became more expensive.

33.-34.-35. Activities:

While vacationing a large part of the time of tourists' goes to activities. With the obtained answers of this enquiry, the most popular activities are quantified, as well as if any change in preference(s) materialize between the past, present and

future are examined. Last, a principal factor is substitution of activities, as well as the sensitivity of some, due to external influences. (Iso-Ahola, 1986) As a result, the energy-related activities and if the participants switched for non-energy consuming ones are being especially examined.

36. COVID's financial impact:

The COVID-19 pandemic, which began in late 2019 for the Chinese mainland and early 2020 worldwide, has been without a doubt an impactful event for the majority of the worldwide population, due to its nature and severity. (Goodell, 2020) Significant economic losses have been recorded for a number of people and businesses around the globe. By raising such an enquiry, the financial impacts of the pandemic are being ascertained. In any case, because individuals from different backgrounds and of divergent financial robustness, are being examined, the results are expected to differ.

37. Energy crisis' financial impact:

Besides the COVID-19 pandemic and its financial impact, during the early 2022 the globe was facing other financial risk, that of an energy crisis. Using this open-ended question, the type and severity of the financial impacts this event had on individuals is being examined. This recent energy crisis disposes a different dynamic than the past ones. Last but not least, the energy crisis financial impacts, may as well affect individual's overall income, therefore decreasing the available budget of tourists.

38. Goods to sacrifice to save money:

Living in a highly uncertain globalized scene, individuals having recently experienced two costly recessions (one which began in 2009 and the recent one in 2022) plus the effects of the COVID-19 pandemic, all the above make saving an exceptionally toilsome process. Indeed, the recent recession and high inflation in energy-related products (as well as non-energy related products) raises the question: "which products are worth sacrificing to save money from?" (Owayni, 2022) Therefore, customers' preferences and opportunity cost are being examined.

39. Accommodation valuation for using energy-saving practices:

By studying the perception of an individual in regard to how they valuate energy-saving practices and techniques implemented by hotels or other lodging

types they visit, a clearer picture of people's point of view is being obtained. Therefore, by creating a scale, the participants are allowed to express this perception. Moreover, this question predisposes (up to a certain degree) how energy-conscious individuals are.

40. Wind turbines disturbance:

According to some studies and research wind turbines can cause distress and overall disturbance to individuals, due to the noise they produce as well as esthetically. (Radun et al., 2022) (Knopper et al., 2014) Additionally, wind turbines are highly relevant with the topic of discussion, being a renewable source of energy. While regular sources of energy are becoming more and more expensive and scarce, a plethora of countries are moving towards renewable energy. (Abdelilah et al., 2022) The enquiry above unveils the public's perception and reaction towards wind turbines.

41. At home energy-saving practices and techniques:

Whether an individual is eco-friendly or not, practicing energy-saving techniques not only aids the environment and its resources but also helps reduce the electricity, heating and other consumption and bills (to some extent). By posing this enquiry the ratio of people who apply these practices and those who do not is analyzed. Additionally, the techniques which are most used are being closely inspected, and perhaps a behavioral pattern of the participants emerges.

Accommodation businesses' questionnaire breakdown:

Questions' number	Part	Type	Brief description
1-4	A	Demographic features	This section's enquiries are formulated to determine the respondents' age, income, gender,

			as well as other demographic characteristics.
5-7	B	Business characteristics	This section's enquiries are formulated to determine some valuable business details.
8-23	C	Tourism consumption	This section's enquiries are composed in order to extract the reactions and outcomes regarding the tourism activity from the managers' perspective.

Table 2

Questionnaires' enquiries analysis

Part A: Demographic questions

Typically, demographic inquiries aid in creating profiles by identifying knowledge, habits, and approaches. Additionally, an analyst can gather more precise data about a person's values, habits, and behaviors by understanding their background.

1. Age:

Age is a crucial sociodemographic variable, which offers a brief glimpse into hoteliers' or other lodging managers' possible managing style, perceptions, skills

and experience.

2. Gender:

Gender appears also in this questionnaire, similar to the tourists' one, as sex is an important variable. Gender predicts more variation in sex role beliefs than any other predictor, since it limits the effects of social position, community size, and college major. (Martin et al., 1980)

3. Education level:

The education status is a significant factor because typically a greater level of education influences both the type of profession and the individual's wage. Also, individuals with greater levels of education are more concerned with social welfare and act in a more environmentally friendly manner as a result. (Meyer, 2015)

4. Specialization of studies:

Discussing the education level, it is of importance to acquire the specialization of individuals' studies. The educational background provides more inside into the owner or manager, their management style, their adaptability as well as other factors. Last but not least, through the studies, managers gain experience and knowledge about the sector, which are necessary.

PART B: Business characteristics

5. Foundation year:

The accommodation's establishment year not only reveals how old a lodging is, but also predisposes for its technological infrastructure and/ or other changes necessary for its maintenance. Moreover, an accommodation's history and its inveteracy may reveal other events and crisis the manager has encountered before.

6. Accommodation type:

Before delving into the main questionnaire, it is important to establish the type of the accommodation. Certainly, not all types (or the major ones mentioned here) possess the same needs for energy-related goods. Therefore, some lodging types become less energy dependent than others. Another factor to keep in mind is the size of the accommodation area. The bigger the establishment and its venues the bigger its energy needs.

7. Quality stars:

Accommodations who hold quality stars, usually have higher standards for what they offer. More specifically, for Europe, the Hotelstars Union has established the categories and minimum requirements to obtain a number of stars, with 5 being the outmost. Therefore, the higher the standards, quality and amenities, the higher the energy needs for a lodging.

PART C: Tourism consumption-related
8.-9.-10. Number of guests:
Using this three-fold question, the real change noticed between 2021, 2022 and 2023 is being studied. This will give a clearer picture of the tourism activity as experienced by the managers themselves. Moreover, the results over the years, as well as between the establishments may be compared. Last, it is being clarified that the observations would be expressed in percentage having either the minus or the plus sign in front of the number in order to reflect either the decrease or the increase accordingly.
11.-12.-13. Number of days spend by guests:
As discussed in the literature review part, during the past energy crises it has been noticed that tourists would shorten the days of their vacation, as a reaction to the energy products' prices. By posing this enquiry, this observation is being studied and a safe conclusion regarding this recent energy crisis is the aim. Once again, the question is posed as a three-fold for the time periods mentioned before.

14.-15.-16. Guests' habits:

Similar to the question directed at tourists, hereby the same enquiry is posed in an open-ended form towards the hoteliers/ managers, in order to obtain their point of view as well. The goal is to compare not only the two groups' perspectives, but also to inspect them over time individually. Last, due to the events which occurred during these three years, the changes in habits from a socioeconomic angle is inspected.

17.-18.-19. Guests' expenditure (per stay):

By asking this question, this observation is investigated, and the aim is to safely draw a conclusion on the current energy issue. Due to the general inflation during 2022, it is expected to observe changes in guests' expenditure behavior, from the viewpoint of lodging managers, as well as their expectations for 2023. Finally, it is explicated that the observations will be expressed as percentages with either a minus sign or a plus sign in front of the number to reflect the appropriate drop or rise.

20. Energy crisis' financial impact:

Over the past year of 2022, multiple businesses both in the accommodation and Food & Beverage sector have witnessed irreparable damages in thousands or millions of dollars, due to the energy crisis and the all-time high inflation rate. (Glauber and Smith, 2022) (Miljak et al., 2022) (Foley, 2022) Besides higher energy prices consequently influence other goods', commodities' and services' prices.

21.-22. Energy-saving practices:

Using a two-fold enquiry this time, for the years 2021 and 2022, it is being examined first if the lodging businesses are using any energy-saving practices and techniques as well as the percentage. Then, the practices implemented by them are being analyzed. As accommodation companies (a significant number of them) were affected by the energy crisis, it would be essential to examine whether or not managers implemented further measures of that kind. Moreover, it is significant to examine any change in measures between the two years, as

2022 was the year in which energy crisis manifested. Last but not least, as discussed in the tourists' questionnaire breakdown, whether a manager is environmentally conscious or not, using energy-saving strategies benefits the environment and its resources as well as lowers power, heating, and other use as well as expenses.

23. Environmentally friendly practices:

In the last enquiry, being an open-ended question, the general eco-friendly techniques accommodations are using are investigated, regardless of the energy-saving practices. Broadly, an environmentally friendly lodge uses sustainable best practices in its supply chains, maintenance and services, in order to decrease its impact on the environment. Utilizing ecologically friendly goods and aiming towards zero waste procedures, are a few examples of possible measures. (Abdou et al., 2020) Utilizing this enquiry the percentage of accommodations which indeed implement and practice environmentally friendly techniques is quantified. Experiencing energy crises, businesses should look forward eco-friendly practices, as these reduce their carbon footprint while also reduce the expenses of their energy consumption.

<u>Procedure</u>

Social media was used exclusively to reach out to participants, in regard to the tourists' questionnaire, and more specifically "Facebook". From January 25 until February 7 of 2023, therefore two weeks, it was the period of recruitment. It should be emphasized that using social media platforms for recruitment tactics has its limitations.

In regard to the accommodations' questionnaire, the researcher reached out privately to the lodging businesses, and collected the answers through the google forms, in which platform the surveys were sent back.

The participants of each questionnaire were provided with a statement of anonymity and confidentiality, a brief summary of the usage of the questionnaire, as well as the average completion time, on both surveys. Furthermore, in order to guarantee a thorough comprehension of the questions, examples or further instructions were given when needed.

Data

A data clean-up was first initiated using the Microsoft Excel program. More specifically, some responses were corrected. These corrections pertain to grammar issues, translation to the English language, numerical, and structural correction.

For the data analysis, to begin with descriptive statistics were performed in order to explain the data, in the first instance. Then, in a secondary level, a correlation analysis was conducted in order to observe any correlation patterns in the dataset. In order to perform the correlation analysis, it was necessary to code the data in binary/dummy form. Last, a regression analysis was performed, in order to better explain the data, their correlation patterns and dependence.

Pertaining to the regression analysis, for the tourists' questionnaire and data, three models were run. The first one had "expenditure 2023" as the dependent variable (Y), while various combinations were tested as independent variables (X), however the model ended up with "income range", "expenditure 2022", "expenditure 2021", "summer days off 2023", "tourist activity-COVID", "accommodation 2023", "occupation", "summer days off 2021", "accommodation 2021". The second model had "income range" as the dependent variable, and "country", "sector of employment", "education level", "expenditure 2023", "other days off 2023", "gender", "age group", "expenditure 2021", "transportation 2022", as the independent variables. The third model had "days of summer vacation 2023" as the dependent variable, and "other days off 2023" "other days off 2022", "days of summer vacation 2022", "expenditure 2021", "expenditure 2023", "accommodation 2021", "age group".

In reference to the regression analysis for the accommodations' questionnaire, once again three models were run and analyzed. The first had "change in number of days spend by guests 2023" as the dependent variable (Y), while "change in expenditure 2023", "change in number of guests 2023", "education level of

managers", "quality stars of the accommodation", "environmentally friendly practices", "specialization of studies of the managers", "change in expenditure of guests 2022", "change in number of days spend by guests 2022" were the independent variables (X). The second model had "change in number of guests 2023" as the dependent variable and "change in number of days spend by guests 2023", "education level of managers", "quality stars of the accommodation", "environmentally friendly practices", "specialization of studies of the managers", "change in expenditure 2023", "change in expenditure 2022", "change in number of days spend by guests 2022" were the independent variables. Last, the third model had "change in expenditure of guests 2023" as the dependent variable, and "change in number of guests 2023", "change in number of days spend by guests 2023", "education level of managers", "quality stars of the accommodation", "environmentally friendly practices", "specialization of studies of the managers", "change in expenditure 2022", "change in number of days spend by guests 2022" were the independent variables.

Moreover, for the regression analysis and pertaining to all six models in total, the main hypotheses were:

H_0: the variables are independent.

H_1: the variables are dependent.

Last but not least, for both parts of the analysis, the expected data were in qualitative and quantitative form. Besides, a large portion of the open-ended questions offered qualitative variables, for which a qualitative analysis was more fruitful.

Chapter 4

<u>Analysis and Discussion</u>

<u>Accommodations Descriptive Statistics</u>

PART A:

<u>Age</u>

The average age of managers was 36.5 years. Moreover, as evident from graph 1 of the appendix, the higher concentration was for the age groups 18-29 and 30-39, both of which held 30.77% of the total distribution. The least concentrated group was that of 50-59 years of age, with 15.38%. In the middle, holding 23.08% of the sample was the 40-49 group. Therefore, all age groups are present in the sample.

<u>Gender</u>

The gender distribution, as demonstrated in graph 2 of the appendix, is somewhat equilibrated for both genders. The female managers appear to be dominant as they held the bigger share, i.e., 61%. Male managers, still are represented here, holding 39%.

<u>Education</u>

It is not surprising the fact that 54% (graph 3 of the appendix), therefore more than half of the managers, held a bachelor's degree, as running and managing a lodging business requires a level of expertise and certainly skills. Then, the second highest percentage is for Master's degree graduates, which is the highest level of education presented in the sample. Last, the lowest representation is High School (8%) and Undergraduate (also 8%).

<u>Specialization</u>

As illustrated in the 1st graph below, an overwhelming 46.15% of the managers has study specialization on "Tourism/ Hospitality", which entails skills and knowledge derived from the studies. Two other fields, that of "Marketing" and "Law" held 15% each. The data then present 23% of other study areas, one of which remained undisclosed, while the other two were "Accounting" and "Geotechnologist".

Study specialization

7,69%

15,38%

46,15%

15,38%

15,38%

■ Tourism/ Hospitality   ■ Marketing   ■ Law   ■ Other   ■ Undisclosed
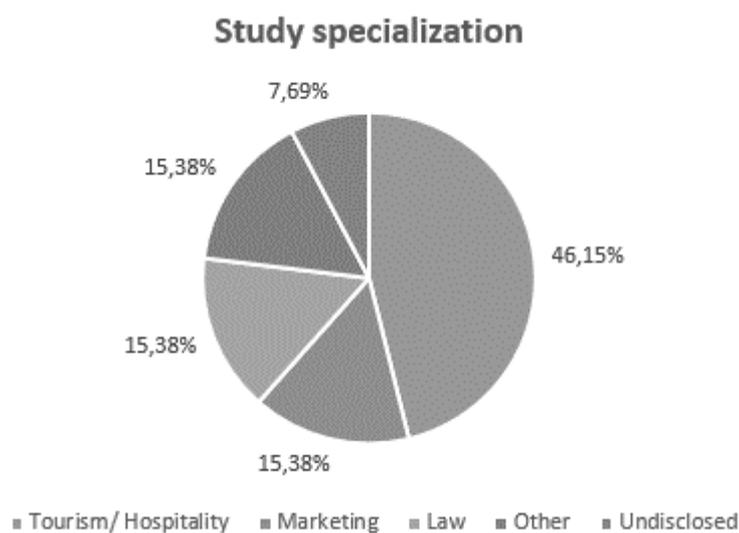
Graph 1

PART B:

Year of establishment

The dataset presented an even distribution regarding the year of foundation of the lodging businesses in question (graph 4 of the appendix). The average year of establishment was 2002. More specifically, three decades (1990-1999, 2000-2010, 2011-2020) held the 92% of the sample. Each of these decenniums possessed 31%. One accommodation was founded in 1979, and therefore stands as an outlier in the sample.

Accommodation type

In the selection of data (as one can perceive from the fifth graph of the appendix) most observations, and more precisely 46%, were hotel businesses. Then, rooms/apartments to rent held the second largest percentage with 23%. The other two accommodation types, i.e., "Airbnb" and "Resort", present 15% of the

sample each.

Quality stars

The average stars in the dataset were 3 stars. Analyzing the sample (graph 2 below), it becomes noticeable that 38% of lodging businesses sustain 3 stars, while 30% possess 4 stars. The accommodations which held 5 stars were 15%, in the sample. The outliers pertain to zero stars and 2 stars, both of which present 8% of the distribution. Regarding the one-star qualification, this was not represented in this sample.

Quality stars

15,38%   7,69%

7,69%

30,77%

38,46%

■ No star ■ 2 stars ■ 3 stars ■ 4 stars ■ 5 stars
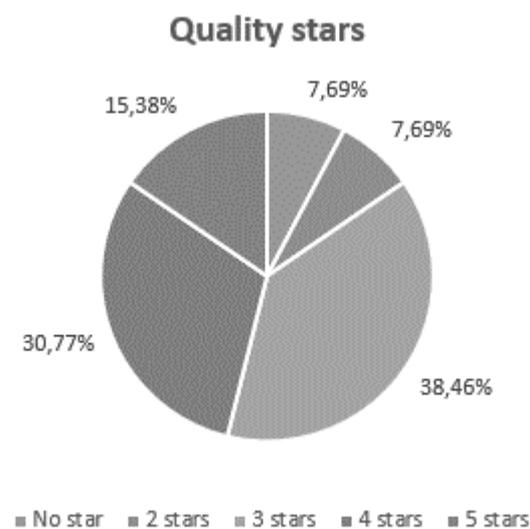
Graph 2

PART C:

Guests 2021

The average difference in number of guests in 2021, as experienced by the managers was   -26% (decrease). Categorizing the data into clusters in order to analyze them more conveniently, it is observed that the majority of the managers report a 40% to 60% decrease in guests (graph 6 of the appendix). Moreover, 15% of accommodation managers have reported a 10% to 39% decrease. In total the decrease amounts for 77% of the dataset. This entails that lodging businesses were either not operating in 2020 or that due to the COVID-19 pandemic still going strong, tourists were not willing to travel bigger distances for vacation. Furthermore, contrary to the above experience, 23% of managers have reported a 1% to 24% increase in guests for the same summer season of 2021, while one

manager has communicated a 0% change. A reason as to a positive number of guests arriving in 2021 may lie with the same reasoning as previously. Location is a crucial factor for the tourists' visitation, as well as normalization after the pandemic's initial shock.

Guests 2022

For the year 2022, the average change in number of guests amounts to a positive 10%. As discerned from the graph 7 of the appendix, 31% of the managers have detailed a 10% to 20% decrease, while the rest 69% have outlined an increase which ranges from 1% to 60%. As deduced for the summer season of 2022, the normalization back to pre-pandemic numbers has begun, while the energy crisis rises overall.

Guests 2023

Comparing the average change in number of guests between 2022 (10%) and 2023 (15%), it is ascertained that there was a growth of 50%. Moreover, as evident from graph 3 below and as expected for the year 2023, all managers (so 100%) have reported an increase in number of guests ranging from 2% to 40%. The highest concentration is among 1% and 24% of rise, with 77%. The rest 23% lies between 25% and 60% rise. Therefore, a steady increase is being observed for the upcoming season, which entails an overall growth for the tourism sector.

Change in number of guests 2023

23,08%

76,92%

■ 1% to 24% increase   ■ 25% to 60% increase
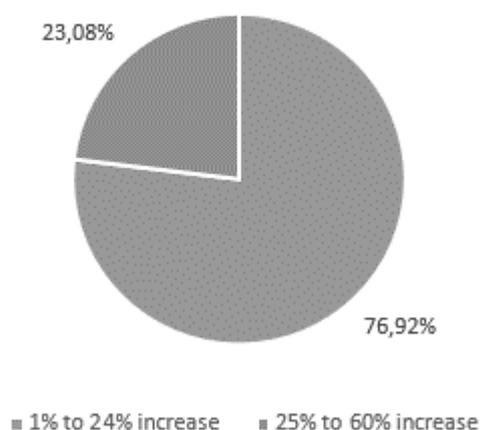
Graph 3

Days 2021

In regard to the 2021 summer season, the average change in days spent by guests amounts to -21% (a decrease). 23% of the accommodations have reported an increase in number of days, while 69% have reported a negative number. Last, one accommodation manager has reported a 0% change. Like in the previous sets, various bundles were created, as seen in graph 8 of the appendix. The majority of the managers, 46%, have experienced a 25% to 50% decrease in days spent by guests. Moreover, three managers have reported a 10% to 24% decrease, while the same number of managers, so 23%, have communicated a 1% to 10% increase.

Days 2022

The average change in number of days for the summer season of 2022 was 4% (positive). Three accommodation managers, so 23%, have reported a decrease in days spend by guests, while nine, therefore 69%, have disclosed an increase. Last, one manager has described a zero percent change, as evident from graph 9 of the appendix. For the accommodations which reported a negative change, the percentages ranges from -10% to -24%. As mentioned in the literature review part, plenty of tourists, due to increased prices in tourism products and services, prefer to reduce their vacation days rather than cancelling altogether. Regarding the accommodation managers who disclosed a positive change, five of them (so 38%) have experienced a 1% to 10% of an increase, while four (so 31%) a 11% to 50% increase. These positive changes may be explained as a movement back to normalization (post pandemic) as well as tourists' reactions to changes in goods and services due to energy inflation differ based on their income, preferences, and substitution, among other factors.

Days 2023

For the upcoming summer season of 2023, the average percentage of days spend by guests was +13%. Comparing this percentage with the percentage of the previous year (2022) a 225% growth is being observed. Furthermore, 85% of accommodation managers have reported an increase in days (graph 4 below), while 15% have expressed a 0% change for the same summer period of 2023. To

elaborate more on the former, 54% will experience an increase between 1% and 10% and 31% will experience a rise of the range from 11% to 50%.

Change in days spend by guests 2023

15,38%

30,77%

53,85%

■ 0%   ■ 1% to 10% increase   ■ 11% to 50% increase
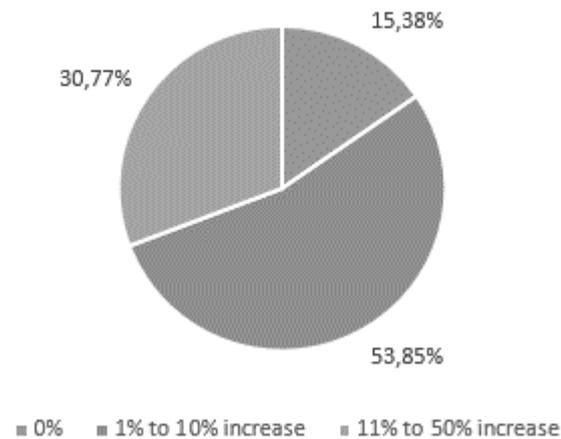
Graph 4

Habits 2021

In order to explain the changes in guests' habits, as reported by the accommodation managers, six major categories were constructed to quantify the frequency of the qualitative data, as visualized in graph 10 of the appendix. The results reveal that 23% of the managers have communicated change in lodging products (two of them negative and one positive), 38% changes in excursions and transportation (three experienced a positive change and two a negative one), 23% in protective measures against COVID-19, 15% negative change in duration of stay, 23% changes in the patterns of guests eating habits (two managers disclosed that tourists eat-out less, while one the opposite). Last but not least, it is worth mentioning that one manager disclosed a change in mood of guests describing them as "more demanding", while another manager described them as "less enthusiastic about their holidays".

Habits 2022

The same six categories were maintained in regard to the managers' responses, as evident from the 11th graph of the appendix, with percentages expressed in frequency. However, in relation to the duration of guests' stay one manager has reported an extension in days spend for the summer season of 2022. Other reactions pertain to changes in consumption of services and goods (23% of

managers expressed an increase, while 15% a decrease), changes in excursions and transportations (38% expressed increase), changes in COVID stance (15% communicated relaxation in measures followed by guests), changes in eating-out habits (23% reported that guests ate-out more and one manager communicated the opposite). Finally, 30% of managers have expressed shifts in regard to the guests' mood, once more. More specifically, 23% reported an overall excitement, while one manager noticed that guests were "demanding and less patient".

<u>Habits 2023</u>

Navigating through the upcoming guests' habits for the 2023 summer season, the six main categories stand here as well, expressed in frequency percentages in graph 5 below. To begin with, the majority of the managers and more specifically 54% of them have reported that they expect an increase in consumption of lodging and other goods and services. Moreover, 39% expect an increase in excursions to nearby places, one manager has expressed that they expect to return to normality fully, two managers expect a rise in the duration of guests' stay, while one manager expects that tourists' demand will be increased regarding eating-out. Last, the final category, i.e., guests' mood, presented some new elements. One manager report that they expect their guests to be "demanding and anticipating a perfect service and facilities" due to inflated prices. Another manager describes that the guests would like to "live like a local", therefore expecting of a more personalized experience, and will expect "greener practices" from the accommodation. Finally, one manager expects that the guests will be more mindful of the satisfaction they reach during their stay.
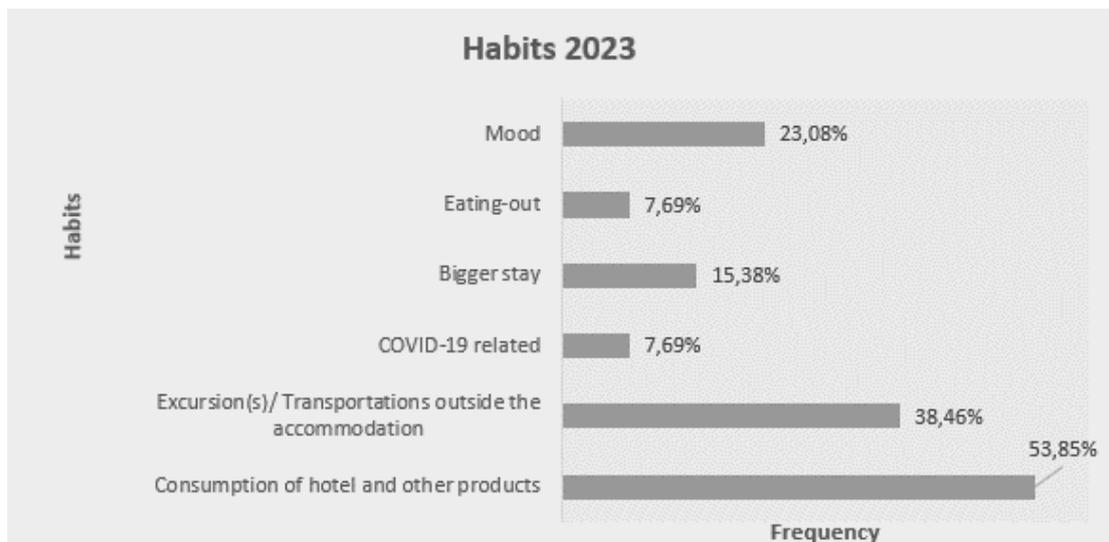
Graph 5

<u>Expenditure 2021</u>

The average change in guests' expenditure per stay rate in 2021 was -13% (a decrease). As illustrated from the 12th graph of the appendix, four accommodations, so 31% of the sample, have reported an increase in guests' expenditure per stay, while 9 (69%) have responded with a decrease. More specifically, four accommodation managers have detailed an increase ranging from 1% to 19%. On the contrary, four managers outlined a 30% to 50% decrease, while five other experienced a 1% to 29% of a decrease in guests' expenditure. These differentiations among the lodging businesses may be interpreted based on COVID-19. In Greece, 40% of all hotels did not operate due to the pandemic. (Vasilakos, 2020) Therefore, managers could increase the prices, in order to increase their revenue as much as possible. Respectively, another pricing tactic is to decrease the prices for the purpose of increasing the overall demand per room.

<u>Expenditure 2022</u>

Regarding the summer season of 2022, the average change in expenditure per stay by guests was a positive 5%. Five accommodation managers (38% of the sample) have reported a decrease in expenditure by guests, while eight (62%) have reported a positive change, as visualized in graph 13 of the appendix. More precisely, the decrease ranges from -1% to -29%, while the increase ranges from +1% to +30%. From the latter, 39% of the managers detailed a 1% to 19%

increase and 23% of managers have described a 20% to 30% increase. As discussed in the previous segment, pricing tactics may vary. Moreover, for the season of 2022 the sharp increase in energy prices could influence the pricing strategies of the managers. (Research Institute for Tourism, 2022) The increase of prices by managers and consequently the increase in guests' expenditure per stay can easily be understood as there was a sharp rise in energy costs as well as a rise in products purchase costs.

Expenditure 2023

Analyzing and comparing the previous season's average rate (5%) with the 2023 average rate (standing at a positive 11%), there is a 120% increase from one year to the other. Additionally, 85% of managers have reported that they expect an increase in expenditure of guests in 2023, while one manager expects a zero percent change, as evident from graph 6 below. Last, one accommodation manager has detailed their expectations of decrease in expenditure for the same year. In detail, the expected decrease is -4%. On the contrary, 46% of managers outline a 1% to 19% increase, while 38% outline a 20% to 30% rise.
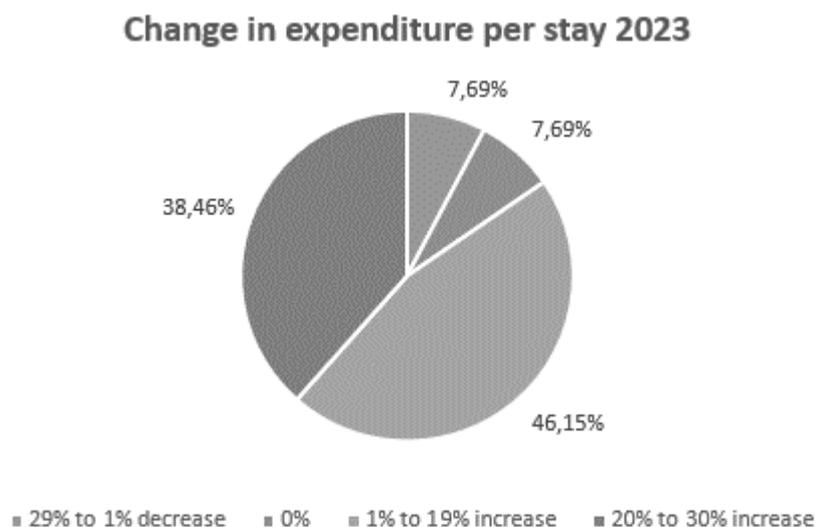
Graph 6

Energy crisis impacts

From the total sample, only one manager communicated that their accommodation business was not affected in any way by the energy crisis. All other managers described a negative impact. More accurately, in frequency terms and as presented in graph 7 below, 92% of managers have witnessed

increased energy expenses. In addition, approximately 15% of managers delineated increases in regard to accommodation products and services, while at the same time 15% reported time limitations on services, due to the higher energy costs.
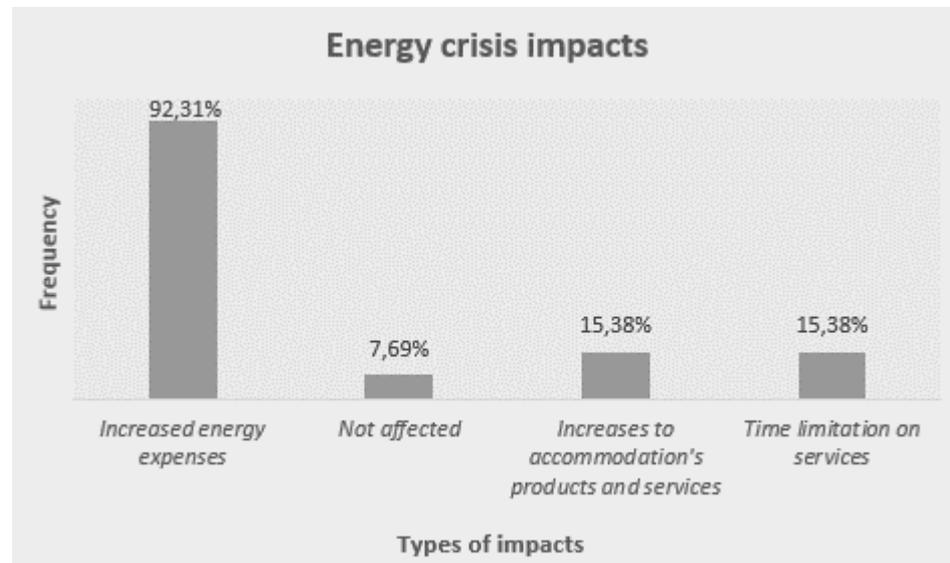
Graph 7

Energy-saving practices 2021

For the year 2021, three accommodations (23% of the sample) reportingly were not using any energy-saving practices and techniques. Conversely, the rest 77% do use some type of a technique. To be more precise, as presented in graph 14 of the appendix in frequency percentages, three accommodation businesses were using solar panels, two accommodations LED lights or lamps, five were applying time limitation on appliances or electricity consumption, three confirmed that they were using a form of energy-saving practice but remained undisclosed, while two accommodations were using differentiated techniques, including: gas heating, motion sensors and better insulation.

Energy-saving practices 2022

In 2022, there was a change in number of accommodations which used and those which did not use energy-saving techniques. The percentage of non-energy saving lodging businesses was decreased. For 2022, the percentage was 15% against 23% of the previous year. Therefore, the accommodations which applied energy saving practices rose to 85%. This shift can be explained as the prices for energy products increased dramatically in 2022. In fact, the accommodation

which enabled the switch was negatively impacted by the energy crisis.
Comparing the two graphs (14 of the appendix and 8 below), the percentage for
the "solar panels", "LED lights" and "undisclosed practices" remained the same.
The "time limitation of appliances and electricity" increased to 46% in 2022,
while also the category "other (techniques)" rose to 23%. The "other" techniques
include gas heating, motion sensors, better insulation and usage of awnings.
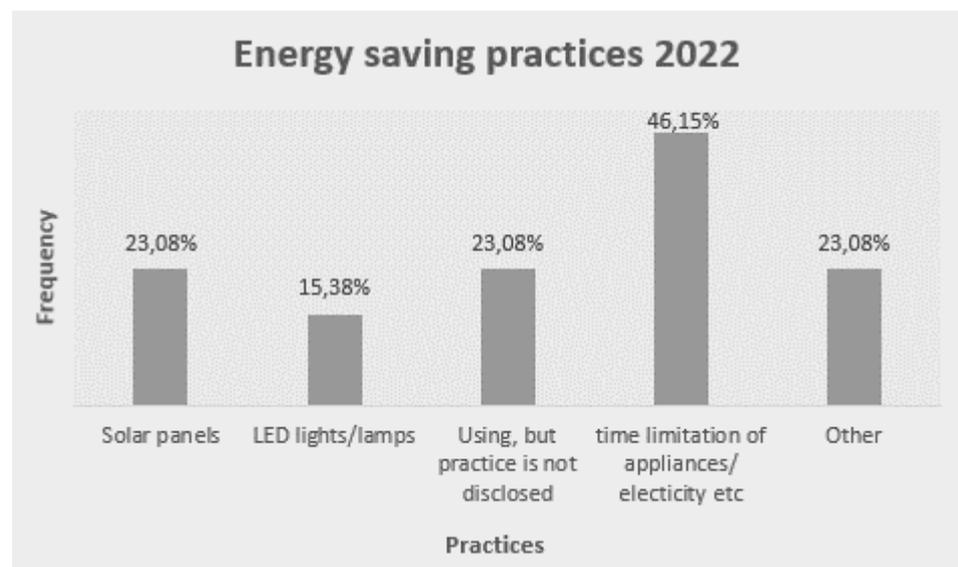
Graph 8

Environmentally friendly techniques

Before analyzing the practices in question, it is worth mentioning the percentage
of accommodations which are practicing and those which do not. Therefore, 15%
of the sample do not use or practice any environmentally friendly technique,
while the rest, so 85%, do apply. To be more precise, these practices (as
expressed in frequency percentages in graph 15 of the appendix) include:
"recycling" (15%), "motion sensing lights and water tap" (15%), "solar panels"
(15%), "time limitation of appliances and/or electricity" (15%), "heat pump"
(15%). Last but not least, five accommodation managers reported that indeed
they are using but the practice(s) remained undisclosed (38% of the sample).

Tourists Descriptive Statistics

PART A:

Country

The majority of the sample, as seen in the graph 16 of the appendix, was from

Greece (82%), the country of origin of the researcher. Furthermore, it is worth mentioning the rest of the countries which consist the sample. Therefore, approximately 5% of the participants were from Cyprus, 2% from Italy, and 1% each from Canada, Spain, Romania and US. Last, 6% of the sample are originated from other countries, which due to the very small representation were abbreviated into this category.

Gender

The gender dispersal in the present dataset (as witnessed in the graph 9 below) was distributed in a rather uniform way, since approximately 58% of the sample were "female" participants, roughly 42% were "male" and one participant selected the option "other", therefore a non-disclosed gender.
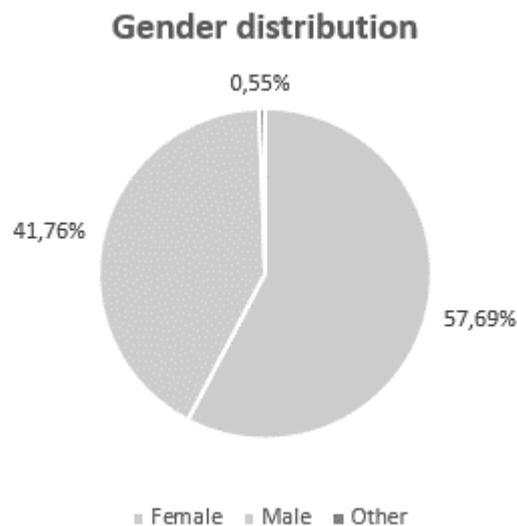
Graph 9

Age

Observing the graph number 10 below, all age groups were represented and included in the sample. The majority of the data were concentrated at the age group "18-29" (43%), followed by "30-39" (28%), "40-49" (20%), and "50-59" (5%). The last three categories held cumulatively 4% approximately. Due to the method of carrying out the survey, i.e., via Facebook distribution, the age demographic and its concentration by nature was targeting younger audiences. However, the distribution (as seen in the results) is representative of the population.
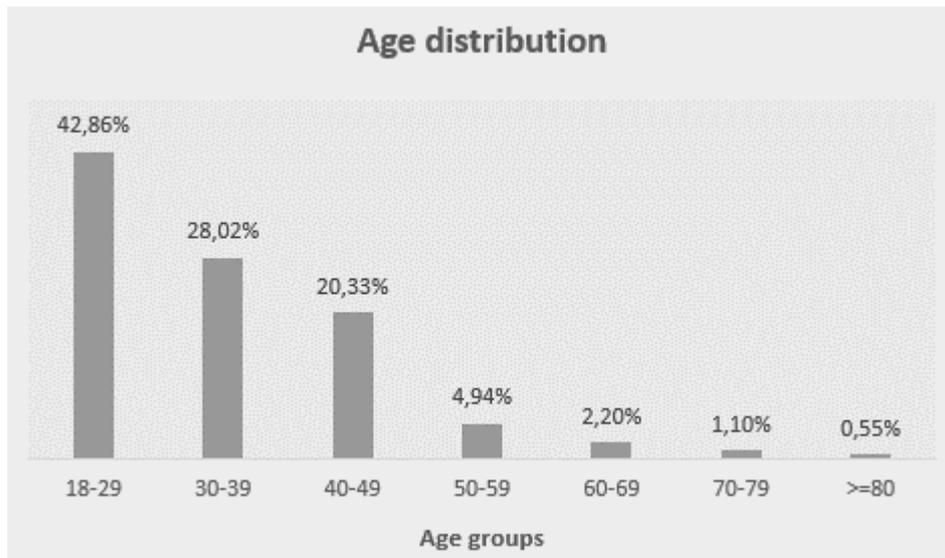
Graph 10

Income

The most commonly reported income range per year was "10.000€-19.999€" (28%), followed by "5.000€-9.999€" (27,5%) and "below 5.000€" (19%). Three categories accumulate 25% of the sample, which includes "20.000€-29.999€" (12%), "40.000€ and above" (7,6%), and last "30.000€-39.999€" (5,5%). Therefore, all income groups were represented in the data.
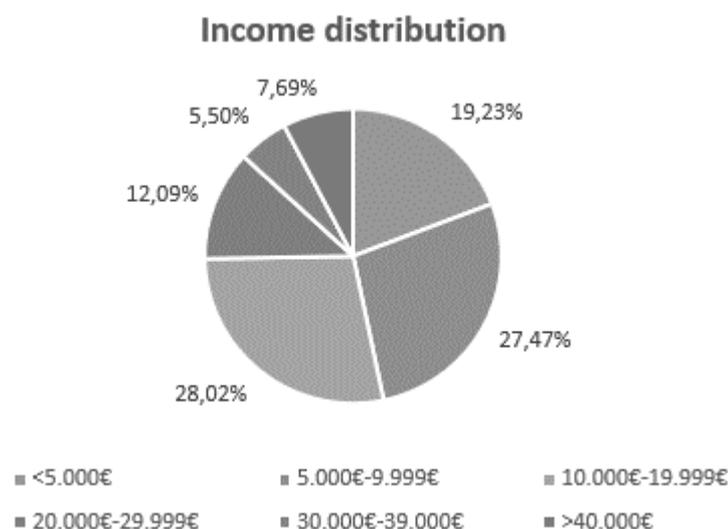
Graph 11

Occupation

After obtaining the answers, the occupations were categorized into eleven major

groups. The first group contains professions under the name "Healthcare practitioners, technical and social science" holding approximately 9% of the total sample. Then the category "Management, Office and Administrative support" was created and was the most commonly answered among participants (28%). The third category includes professions in "Sales and related", holding 7%. The fourth group "Computer and Mathematical" occupied 6%, while class "Educational instruction, Library, Community and Social service" was represented with 10% of the sample. The sixth category, under name "Food preparation and Serving related" accounted for 5% of the distribution, while group "Arts, Design, Entertainment, Sports, and Media" had 3%. The eighth group "Architecture and Engineering" occupied 6% of the sample, and category "Business, Financial and other operations" 12% respectively. The last two categories concern "Pensioners" (3%) and "Unemployed" (12%) accordingly. In the graph 17 of the appendix, occupations are classified in descending order vertically.

Sector

The occupation sector distribution, consisting of three main groups (as illustrated in graph 18 of the appendix), reported that 74% of the participants were occupied in the "Private" sector, 14% in the "Public", while 12% of the sample was unemployed at the time of the survey conduct.

Education

More than 40% of the sample, in regard to the education level they held at the time of the survey, disclosed having earned a "Bachelors' degree" (graph 12 below). Moreover, 35% of the participants held "Master's degree", 15% were "High School" graduates, 6% were awarded with a "Ph.D.", while 3% have communicated that they were graduates of "other" types of institutes, such as technical schools.

Education level distribution
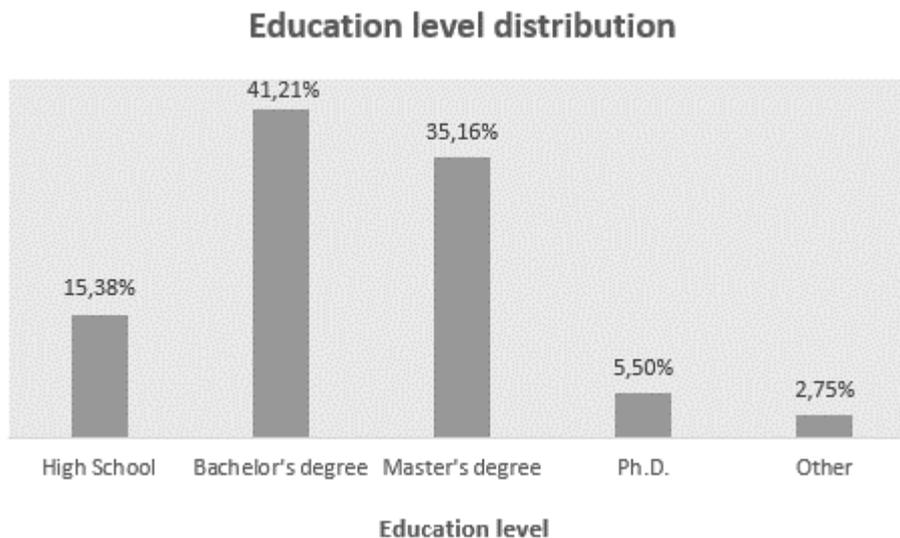
Graph 12

PART B:

Days of summer vacation 2021

The mean days of summer vacation in 2021 was (close to) 18 days, with a range from 0 days (minimum value) to 90 days (maximum value). In order to further analyze the data, eight categories were created, grouping the days in classes (as demonstrated in graph 19 of the appendix). The most concentrated group was "1 to 10" days of summer vacation (36%), followed by "11 to 20" days (30%), "21 to 30" days (13%), and "0" days (10%). Regarding the other groups, each held less than 5%. These include: "51 to 60" days (5%), "more than 61 days" (3%), and "31 to 40" days alongside "41 to 50" days, each holding approximately 2%.

Days of summer vacation 2022

For the summer season of 2022, the mean number of days was 17 days, although the range of days spans from "0" days to "100" days. For the analysis, the eight categories remained as well. The percentages of the groups vary (as illustrated in graph 20 of the appendix). The most commonly reported category was "11 to 20" days (32%), followed by "1 to 10" days (30%), "21 to 30" days (15%), and "0" days (13%). Four groups, each held less than 5%, which include in descending order: "51 to 60" days (5%), "41 to 50" days and "more than 61" days (2% each) and last "31 to 40" days (1%).

Days of summer vacation 2023

Removing the "unknown" answers from the dataset, the mean estimated vacation days for the upcoming season of 2023 were 17 days, ranging from 0 days to 90 days. Regarding the analysis of 2023, nine categories were created, adding the group "unknown yet" (graph 13 below). The most frequent response was "1 to 10" days (28%) as well as "11 to 20" days (28% also), followed by "21 to 30" days (13%), "unknown yet" (13%) and "0" days (10%). Then, four categories held less than 4% each. More specifically, in descending order: "51 to 60" days (3%), "more than 61" days (2%), "31 to 40" days (2%) and "41 to 50" days (1%).
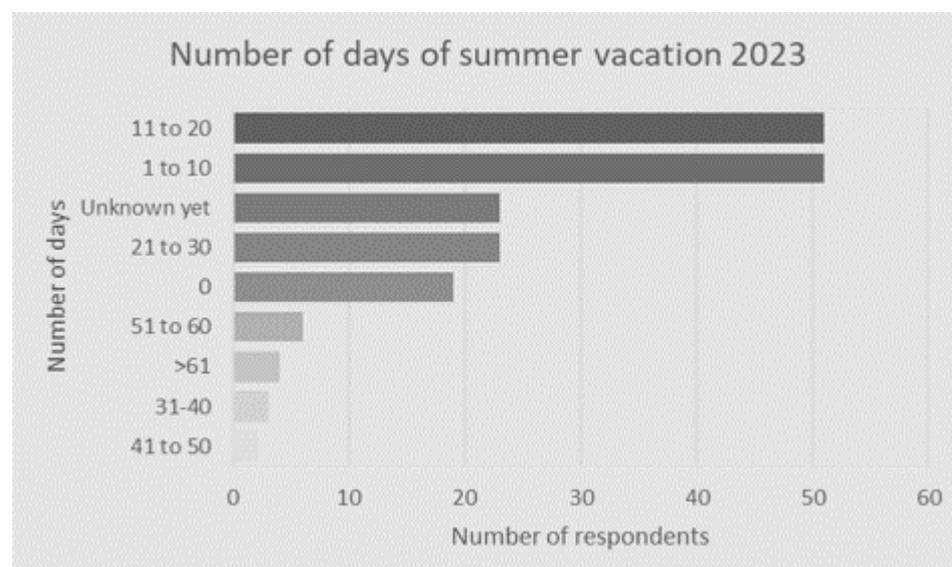
Graph 13

Family members 2021

To begin with, a portion of participants who answered "0" means that they were either not vacationing with a family member or that they did not vacation altogether. Furthermore, analyzing the data, the mean number of family members individuals vacationed with was "2", ranging from 0 to 10 (graph 21 of the appendix). Moreover, seven categories were created in order to classify the obtained answers. The group "1" member contains the most responses (26%), followed by "0" members (25%), "2" (17%), "3" (16%) and "4" (10%). Two categories ("5" and "6 to 10" family members) present less than 5% of the sample cumulatively.

Family members 2022

The mean number of family members participants vacationed with was 2, in a range from 0 to 12. For 2022, the seven categories remained for the purposes of the analysis (graph 22 of the appendix). The category "0" family members was the most commonly answered reply with 27%, while the second most replied was "1" member (24%), followed by "2" (16%), "3" (14%), and "4" (10%). Two groups, that of "5" and "6 to 12" family members had 5% and 3% respectively.

Family members 2023

In regard to the 2023 predictions, in order to calculate the mean number of family members, the "N/A" (unknown yet) responses were removed. Therefore, this number amounted to 2, once more, in range from 0 to 10. In order to analyze the data, eight categories were created, as evident from graph 23 of the appendix. The most commonly replied response was "0" members (27%), and second most answered was "1" member (22%). The other groups also report important percentages, which include in descending order: "2" and "3" (15% each), "4" (9%), "5" alongside "unknown yet" (6% each) and last "10" members (1%).

Before analyzing the data, which pertain to "Expenditure", it is worth mentioning that in the group "less than 100€" people who did not vacation at all are included here.

Expenditure 2021

The price range of the expenditure directed towards vacation purposes with the highest concentration (as depicted in graph 24 of the appendix as well) was "more than 800€" (23%), followed by "200€-299€" (17%), "less than 100€" (13%), "300€-399€" (10%), "500€-599€" and "400€-499€" (each 9%), "600€-699€" and "100€-199€" (7% each), and last "700€-799€" (6%). In general, an even distribution is presented in these data.

Expenditure 2022

Examining the next year's data, i.e., 2022, a similar pattern emerges hereby as well in comparison to 2021. More specifically, as presented in graph 25 of the appendix, the category "more than 800€" was dominant also this year (29%)

having an even higher percentage than the previous year (26% change from 2021). Regarding the rest of the categories these were configured as follow: "less than 100€" 15%, "500€-599€" 11%, "600€-699€" and "200€-299€" and "300€-399€" 9%, "100€-199€" 7%, "400€-499€" 6%, and last "700€-799€" 5%.

Expenditure 2023

Regarding the upcoming summer season of 2023, as illustrated in graph 14 below, the highest quoted value was "more than 800€" (30%). This consist of a 4% change, in comparison to the 2022 year and a 31% change from the 2021 year. The second most common response was "less than 100€" with 14% (which includes the individuals who will not vacation), followed by "200€-299€" (12%), "500€-599€" (10%), "300€-399€" and "400€-499€" (both at 8%), "600€-699€" (7%), "700€-799€" (6%), and last "100€-199€" (5%). The results remain coherent between the years, with no major fluctuation.
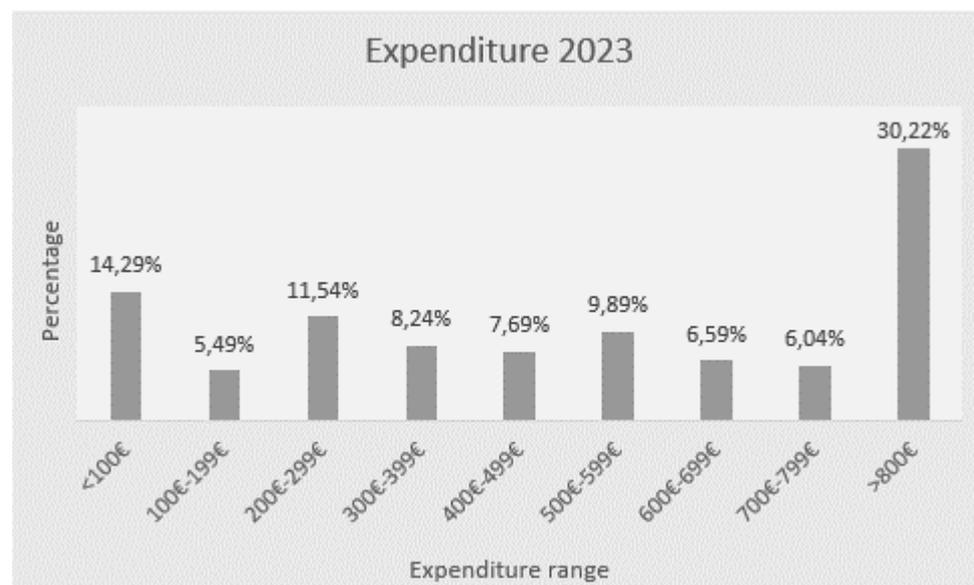
Graph 14

COVID-19 impacts on tourism activity

The average mark regarding the perceived change in the tourism activity due to COVID-19 by tourists was "6", with a range from 0 to 10. As evident from graph 26 of the appendix, the distribution is somewhat even, with the marks "7" and "8" holding the biggest share percentages (16% and 17% respectively). In the contrary, the observations "1" and "4" were holding the smallest percentages with 3% each. Certainly, the highest concentration was presented in the upper

half of the range, i.e., for the marks from 6 to 10, with 58%. This indicates that more than half of the sample perceived that the tourism activity changed for them noticeably and In some cases even severely.

Travel agent vs Individual booking

The majority of the sample (92%) categorically reported that they choose to book their vacation independently (graph 27 of the appendix). The rest 7% of the sample communicated that they choose to book via a travel agent/ operator, while one outlier has answered that what they pick depends on personal undisclosed factors.

Other days off 2021

Some respondents replied with "N/A", explaining the conditions such as "unemployment", "unstable job", "maternity leave" etc.
In 2021, the average number of days off (excluding the summer vacation) was between 10 and 11 days, with a range from 0 to 150 days. The most commonly reported category was "2 to 10" days with 45% (as seen in graph 28 of the appendix), followed by "0" days (27%) and "11 to 20" days (13%). The six other groups cumulatively held less than 15%.

Other days off 2022

The average number of other days off in 2022 was 10 days, with a range from 0 to 150 days. This consists of a change from the previous year (2021) of -3%, therefore a decrease in days. The highest responded answer was "2 to 10" days (43%) – as evident from the graph 29 of the appendix - followed by "0 days" (27%) and "11 to 20" days (17%). Consequently, a similar patter appears for 2022 as well.

Other days off 2023

In regard to 2023, the average number of other days off was 11 days, with a range from 0 to 150 days also. The change from the previous year, 2022, amounts to 10% (increase). The most concentrated reply was "2 to 10" days (42%), followed by "0" days (18%) and "11 to 20" days (14%), as seen from

graph 30 of the appendix. It is worth mentioning that the category "N/A" hereby stands at 13%, demonstrating the uncertainty from some individuals' standpoint regarding the future.

Changes in habits 2021-2022

As presented in graph 31 of the appendix, the percentages were calculated in frequency as tourists may have experienced more than one change. Between the summer season of 2021 and 2022 45% of individuals have reported "no change" in their habits. The second most common answer was "change in destination" (13%), followed by "COVID-19 related" (11%) (implying either relaxation of the protective measures or following the measures still), "change in number of days (9%) (most of which pertain to reduction of vacation days, while less individuals experienced a rise), "change in expenses" (8%) (the majority of the sample reported a reduced budget and a rise in overall expenses, while a minority communicated that their budget was higher in 2022 in comparison to their 2021 budget), while 7% experienced a shift in their "vacation status" from one year to the other, reporting that they did not vacationed in 2022, due to work. Other categories include: "change in transportation mode" (2%), "change in activities and/or night life" (2%), "change in eating-out" (5%), "change in visitation to nearby places" (2%), "change in family members" (2%), "change in accommodation type" (5%).

Expected changes in habits 2022-2023

Comparing the experiences between the 2022 summer season and the upcoming 2023 respectively, a big portion of tourists responded that they expect "no change" at all regarding the latter (41%). Regarding the other categories, as illustrated in graph 15 below, these were arranged in descending order as: "change in number of days" (15%), "change in expenses" (11%) (therefore individuals expect higher prices and reduced budget, while others have described that they are in position to dispose a higher budget for their 2023 vacation), "change in destination" (10%), "change in activities and/or night life" (8%), "change in COVID-related habits" (6%), "change in vacation status" (5%), "unknown changes yet" (4%) (no prediction), "change in accommodation type"

(3%), "change in family members" (2%), "change in eating-out preferences" (2%), and "change in transportation mode" (2%).
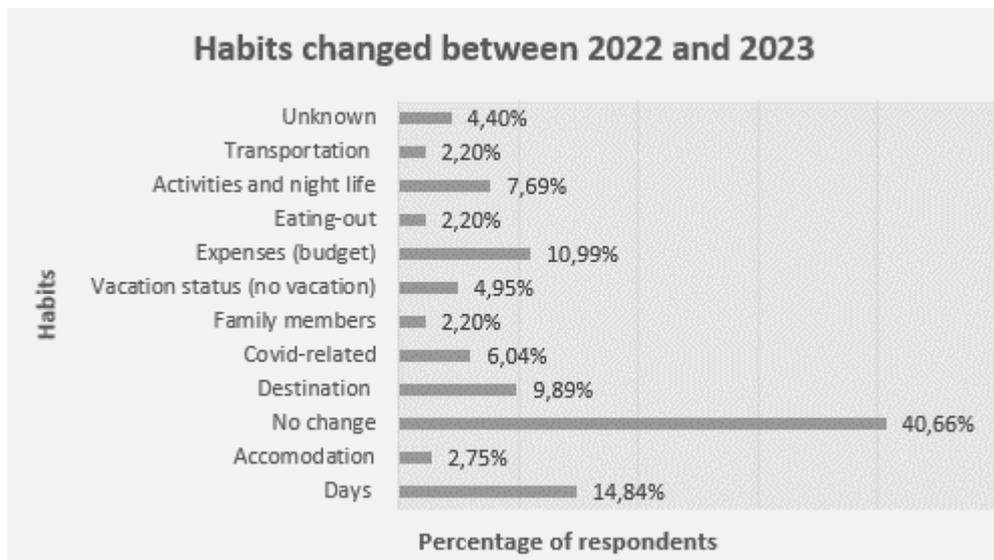
Graph 15

Accommodation 2021

The most frequent response (in frequency percentages), regarding the accommodation type tourists chose to stay for the duration of their vacation in 2021, was "hotel" (28%), followed by "rooms/apartments to rent" (20%), "Airbnb" (14%), "resort" (4%). Moreover, participants enriched the options by adding "camping" (7%), "friend's house" (6%), "beach house owner" (13%) (implying that they vacationed at a destination in which they own a house), and "other" (3%). Last, 5% of the sample disclosed that they did not vacation that year, as also illustrated in graph 32 of the appendix.

Accommodation 2022

In 2022, "hotel" presented the highest concentration as well (28%), while "rooms/apartments to rent" also retained a high percentage (21%), as seen in graph 33 of the appendix. "Airbnb" and "resort" reported higher percentages than the previous year, with 19% and 5% respectively. Pertaining to the added choices for 2022 by the individuals, there were formed (in a descending order) as: "beach house owner" (10%), "camping" and "friend's house" (4% each) and "other" (3%). Last, the individuals who did not vacation in 2022 amounted to 8%.

Accommodation 2023

As illustrated in graph 34 of the appendix, for the upcoming 2023 summer period 36% of the respondents replied that they "haven't decided yet", while 10% reported that they "will not vacation". Therefore, a decrease is observed in all other options. More precisely, "hotel" held 21% (which amounts to a -25% difference from 2022), "airbnb" 10% (-44% change), "resort" 3% (-33% change), "rooms/apartments to rent" 8% (-64% difference), "camping" 3% (-38% difference), "friend's house" 2% (-63% change) and last "beach house owner" 6% (-39% difference). To conclude, an uncertainty is evident from the numbers above.

Transportation 2021

Analyzing the data (in frequency) for transportation mode regarding vacation in 2021 it becomes apparent (from the graph 35 of the appendix) that 23% of individuals chose multiple types of in order to reach their destinations. Furthermore, examining the responses it is being ascertained that 61% of participants chose "car" as (one of) their transportation mode, while 26% chose "ship", followed by "airplane" (23%), "train" (5%) and "other" (5%) as well. The category "other" includes bus and motorcycle. Last, it is also worth mentioning that 6% did not vacation in 2021.

Transportation 2022

For the summer season of 2022 a similar pattern emerges, as illustrated in graph 36 of the appendix. More specifically, 12% of the sample traveled with more than one means. In regard to the transportation types and the frequency they were chosen, some changes become apparent. To begin with, "car" was chosen by 53% of the sample, "airplane" 25%, "ship" 22%, "train" 5% and "other" 4%. In the category "other" bus and motorcycle are included. Last, 7% of the participants "did not vacation" that year.

Transportation 2023

Regarding the 2023 summer period, 18% have disclosed that they "haven't decided yet", while 4% have responded that they "will not vacation" this year (graph 16 below). Furthermore, in frequency terms as well, 11% of the

participants have communicated that they will choose more than one transportation modes. Moreover, 37% will choose "car", 32% "airplane", 17% "ship", 5% "train" and 4% other choice of transportation, such as motorcycle and bus.
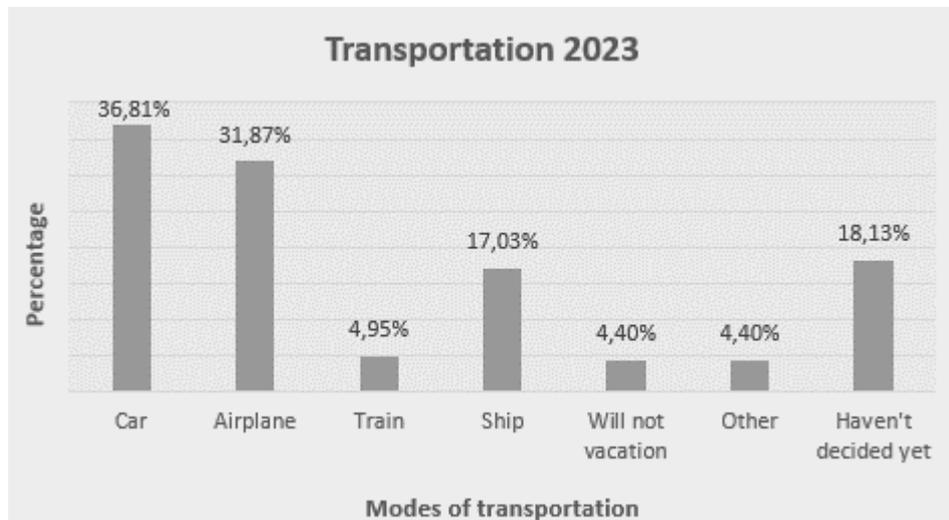
Graph 16

Eating-out 2021

For the summer season of 2021, 50% chose multiple eating-out options (graph 37 of the appendix). To be more precise, breaking down the data in frequency numbers, it appears that "tavernas" was the most popular eating-out choice (73%), followed by "fast food restaurant" (36%), "food to go (like cantinas)" (34%), "a-la-carte restaurant" (24%), "hotel's restaurant (12%), and "other" (7%) (which includes homemade food). Moreover, 5,5% declared that they did not vacation in 2021.

Eating-out 2022

In 2022, as presented in graph 38 of the appendix, almost identical frequency percentages were being witnessed. Analyzing the data, 51% chose more than one options to dine out, these options being: "tavernas" (71%), "fast food restaurant" (35%), "food to go (like cantinas)" (35%), "a-la-carte restaurant" (26%), "hotel's restaurant" (15%), and "other" (7%). Last, 6% of the sample communicated that they did not vacation during the summer period of 2022.

Eating-out 2023

Pertaining to the upcoming 2023 summer season, as presented in graph 17 below, 3% of the sample's participants will not vacation, while 32% "haven't decided yet" and it appears that 37% will choose more than one of the dine out options available. Examining the data, a familiar pattern emerges: 56% will choose "tavernas" to eat-out, 26% "fast food restaurant", 26% "food to go (like cantinas)", 21% "a-la-carte restaurant", 12% "hotel's restaurant", and 4% "other". Therefore, certainly the frequency percentages for the eating-out options are lower than the previous two years, however there is a high uncertainty level, as participants revealed.
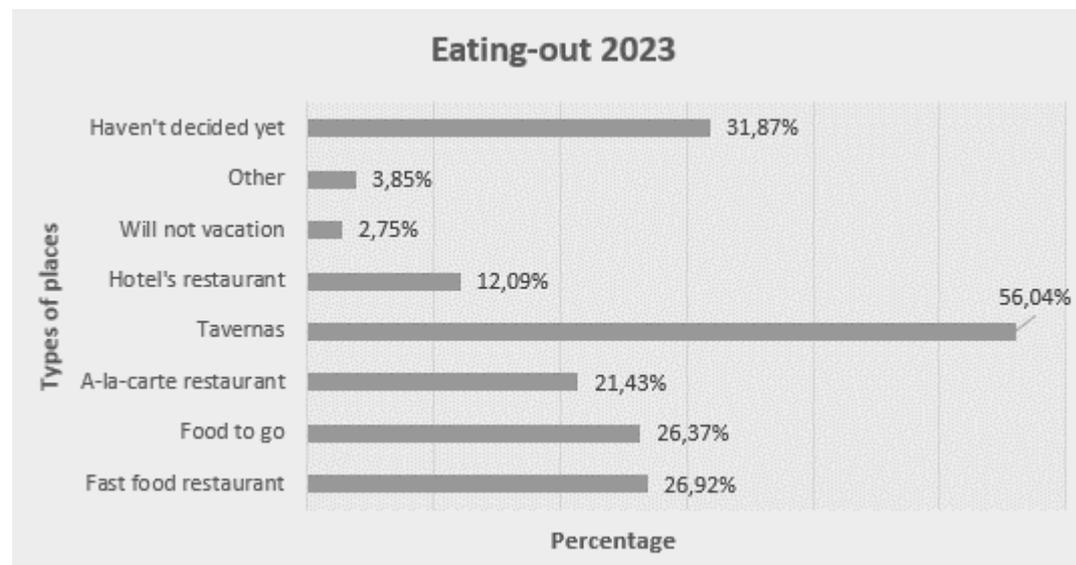
Graph 17

Activities 2021

In 2021, as illustrated in graph 39 of the appendix, the frequency rate for activities in descending order was distributed as: "swimming" 70%, "sightseeing" 60%, "excursions (to nearby places)" 58%, "shopping (including for souvenirs)" 42%, "visiting parks" 21%, "watersports" 14%, "cruise" 10%, "spa/beauty treatments" 8%, "other" 2%. Moreover, 7% has reported that they "didn't vacation" that year.

Activities 2022

Analyzing and comparing the data from 2021 to the ones of 2022, it becomes visible that no major change in activities performed by tourists occurred (graph 40 of the appendix). Not only that but every category had a larger percentage (in frequency terms) except for "cruise" which was decreased by 11% (10% in 2021

and 9% in 2022). Likewise, the category "swimming" witnessed no change at all. Moreover, "sightseeing" increased by 1% (60% in 2021 versus 61% in 2022), "shopping" by 5% (44% versus 42%), "visiting parks" 49% change (21% versus 32%), "watersports" by 12% (14% versus 16%), "excursions (to nearby places)" by 2% (57,69% versus 57,79%), "spa/ beauty treatments" 33% change (8% versus 11%), and "other activities" by 33% (1,6% versus 2,2%). Last, 8% of participants have disclosed that they "did not vacation" in 2022.

Activities 2023

In regard to the up-and-coming summer season of 2023, an extremely similar pattern becomes evident hereby as well, as seen in graph 18. No significant change appears. Individuals who "haven't decided yet" amounted for approximately 3% of the sample, while 4% "will not vacation". All frequency percentages appear to be slightly lower, which is to be expected due to the undecisive responses, with the exception of "shopping" (44% against 41% from last season) and "swimming" (70% in 2023 versus 68% in 2022).
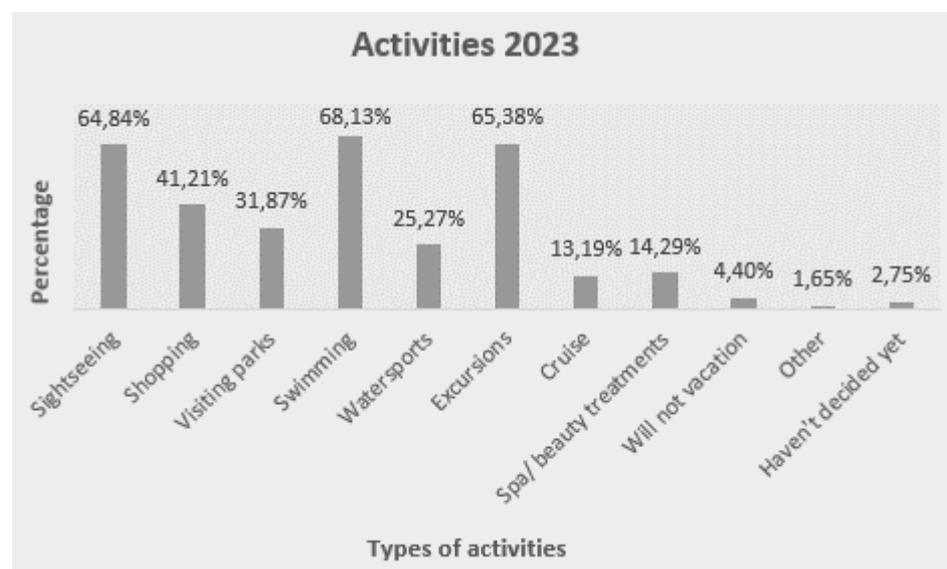
Graph 18

COVID-19 and financial impact

Examining the data, different responses and reactions occurred, as evident from graph 41 of the appendix. More precisely, 46% of individuals have communicated that they were "hardly or not at all" affected financially by the COVID-19 pandemic, while 13% were affected "minimally", 2% were "unable to save money", 6% experienced "loss of income", 5% experienced "loss of job",

13% were affected "negatively" and 15% were "severely or excessively" impacted. Last, it is worth mentioning that 4 individuals (out of 84 people who responded as "hardly/ at all" affected) have mentioned that not only they weren't impacted financially, but their income increased during the pandemic.

Energy crisis and financial impact

Regarding the effect of the energy crisis on the financial state of people, individuals reported a larger negative reaction than that in the COVID-19 area. From the analysis and the graph 19 below, it becomes obvious that approximately 20% of individuals experienced "minimal to no financial" impact, while the rest 80% have experienced a range of impacts by severity. More explicitly, 3% were "unable to save money", 3% experienced "loss of income", 31% reported that their "expenses were increased", 20% were "negatively" affected, while 21% were "excessively or severely" impacted financially. Therefore, from the above it is evident that a large majority of people were indeed affected financially by the energy crisis.
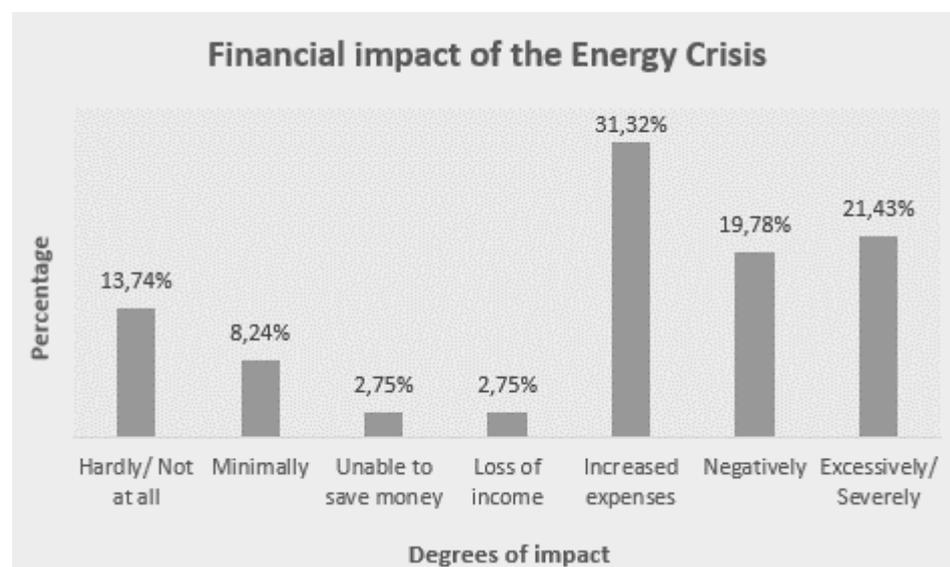
Graph 19

Goods sacrificed for money saving

Analyzing the responses (in frequency percentages) and the graph 20 below produced, two bundles of goods collected the majority of the replies. These bundles were "new clothing, shoes and accessories" (64%) and "furniture, appliances and decoration" (70%). Furthermore, in regard to the other categories there were formed as: "personal care products" amounted to 25%,

"entertainment" 35%, "dining out/ takeout coffees" 38%, "streaming services subscriptions" 32%, "gym or sports memberships" 41%, "vacation and trips" 20%, "other" 1%.
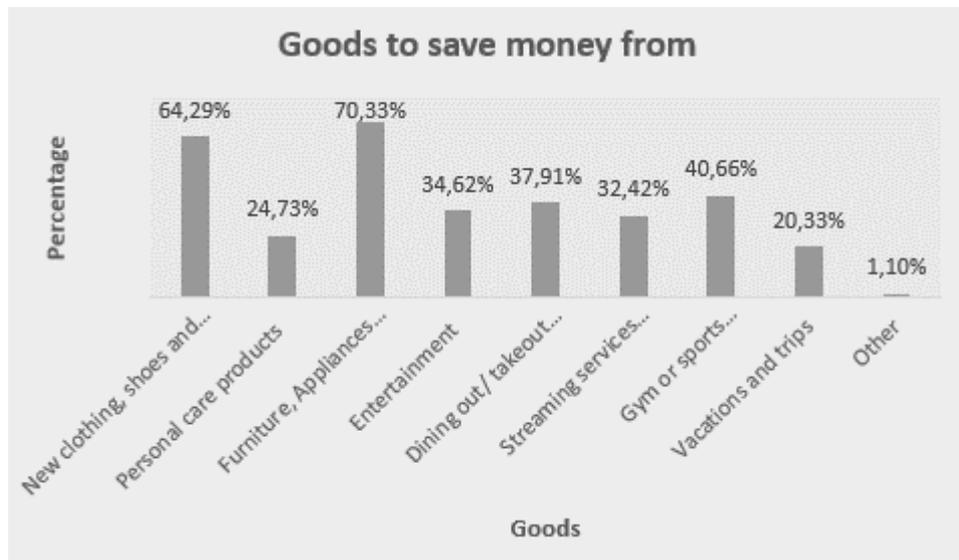
Graph 20

<u>Accommodation valuation for using energy saving practices</u>

Observing the data and graph 42 of the appendix, the average rate was 6.5, therefore somewhat in between 6 and 7 (a positive valuation on average), in a scale from 0 to 10. The highest percentage was presented in "10" (20%), followed by "8" (16%), "5" (15%) and "7" (12%). All other scale values held less than 10% each, with "1" presenting the smallest concentration (1%). Therefore, individuals rather positively valuate accommodation and lodging businesses for such practices and techniques.

<u>Wind turbines disturbance</u>

The mean disturbance rate regarding wind turbines was 4, therefore a neutral to positive reaction to them. The highest concentrated value, as illustrated from the graph 43 of the appendix, was "0" with 25% of responses, followed by "10" (14%) and "5" (14%). Moreover, the percentage of people who responded that they were disturbed by the wind turbines and therefore awarded a "6" and higher rate was 36%, while 50% of individuals awarded "4" or less, communicating that they were minimally disturbed or not at all.

<u>Energy-saving practices at home</u>

As seen in graph 21 below, 92% of individuals replied that indeed they actively use a form of energy-saving practice, while 8% replied that they do not use any. From the former, 96% (of the 92%) discloses the practice(s), while 4% chose not to disclose the techniques in question, but to confirm that they use. In order to sum up the practices or techniques and their frequency rates, seven categories were created. More specifically, 64% responded that they use "energy-saving light bulbs/ LED lamps", 35% use "energy-saving or A+ appliances", 20% "limit the consumption of electricity and gas", 13% "limit the consumption of energy-consuming appliances", 10% use "solar panels (for heating water or electricity)", 9% use "other" practices (such as cooking techniques for less consumption of electricity, smart plugs, motion sensor lights etc.), while 6% use "home insulation". Therefore, the vast majority of people (92% as disclosed) either for environmental or money-saving reasons are concerned about their energy consumption and are mindful regarding this issue.
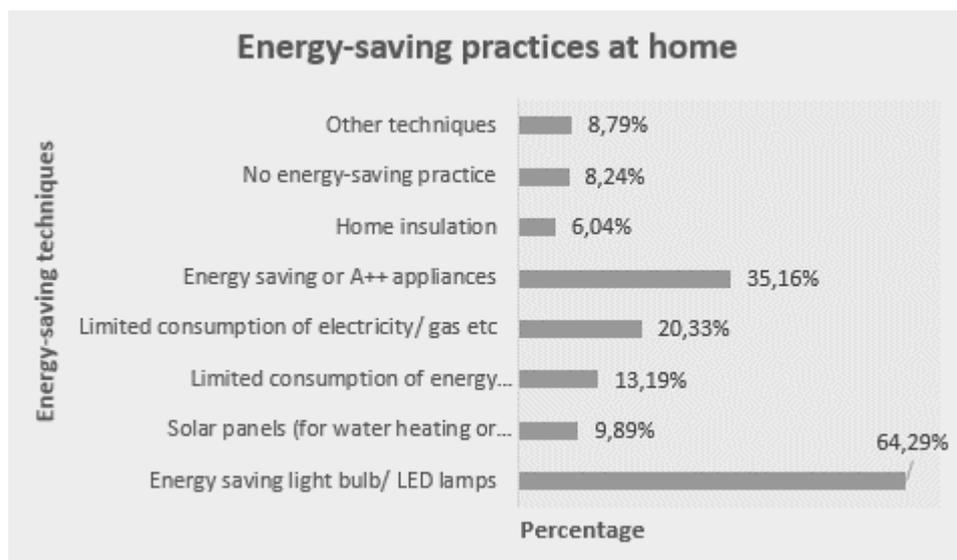
Graph 21

<div align="center">Correlation Analysis</div>

Accommodations

After coding the data and running a correlation matrix analysis (graph 65), multiple variables presented a strong correlation in between them. To begin with, the values between 0,7 and 1 indicate a strong (positive) linear relationship (Ratner, 2009) The correlated values were: "Change in number of guests in 2023" with "education level" of the managers (0,7), "Environmentally friendly practices" with "accommodation quality stars" (0,74), "Change in number of guests in 2021" with "Change in days spend by guests in 2021" (0,87),), "Change in number of guests in 2022" with "Change in days spend by guests in 2022" (0,82), "Change in number of guests in 2023" with "Change in days spend by guests in 2023" (0,7), and last "Energy-saving practices in 2021" with "Energy-saving practices in 2022" (0,77). Therefore, this indicates that for all the above pairs of values, a precise linear rule ensures that as one variable's value rises, the other value's values rise as well. (Ratner, 2009)

The values between 0,4 and 0,7 indicate a moderate relationship, which is worth further exploring. The pairs of values under this rule were: "Specialization of studies" with "Age" of managers (0,6), "Gender" and "Education level" of managers (0,4), "Gender" of managers with "Accommodation type" (0,48), "Education level" of managers and "Change in number of days spend by guests in 2022" (0,47), "Education level" of managers with "Change in number of days spend by guests in 2023" (0,5), "Year of foundation" of the accommodation with "Change in expenditure of guests in 2021" (0,44), "Change in number of guests in 2022" with "Change in expenditure of guests in 2021" (0,42), "Change in number of guests in 2022" with "Change in expenditure of guests in 2022" (0,5), "Change in number of days spend by guests in 2022" with "Change in expenditure of guests in 2022" (0,58), "Change in number of days spend by guests in 2023" with "Change in expenditure of guests in 2023" (0,5), and last "Energy-saving practices in 2022" with "Environmentally friendly practices" (0,4).

Furthermore, the correlation matrix presents negative linear relationships, which means that as one variable increases the other decreases and vice versa. (Ratner, 2009) The pairs which present a moderate negative relationship, so values between -0,4 and -0,7, were: "Change in number of days spend by guests

in 2021" with "Change in expenditure of guests in 2023" (-0,67), "Change in number of guests in 2021" with "Change in expenditure of guests in 2023" (-0,65), "Education level" of managers with "Specialization of studies" (-0,6), "Age" of managers with "Foundation year" of the accommodation (-0,58), "Specialization of studies" of managers with "Change in number of days spend by guests in 2023" (-0,55), "Age" of managers with "Accommodation type" (-0,5), "Specialization of studies" of managers" with "Foundation year" of the accommodation" (-0,5), and last "Gender" of managers with "Number of quality stars" of the accommodation (-0,45).

From the above correlation pairs, there are four which present a high interest in this analysis. The first, is the education level of the managers and the change in number of guests in 2023, which suggests that the higher the education level (i.e., closer to Ph.D.) of the managers in change, the higher (so more positive) the percentage of guests incoming in the upcoming 2023 season will be. Then, the pair quality stars and environmentally friendly practices, which indicates that the more quality stars held by the accommodation, the more the lodging place implements eco-friendly techniques. Moreover, the couple days spend by guests and number of guests in 2023, suggests that as number of guests grows, then the days spend by them also grows. Last, a negative correlation worth mentioning is that of gender and quality stars. This indicates that, the less quality stars held by accommodations, the more likely is for accommodations to be run by female managers.

	Age	Gender	Educ	Special	EST	Ac.Type	Stars	Guests 2021	Guests 2022	Guests 2023	Days 2021	Days 2022	Days 2023	Exp 2021	Exp 2022	Exp 2023	ESP 2021	ESP 2022	E.F.P
Age	1																		
Gender	-0,42896	1																	
Educ	-0,4128	0,41211	1																
Special	0,60634	-0,44473	-0,62168	1															
EST	-0,58284	0,2052	0,1945	-0,50647	1														
Ac.Type	-0,5041	0,48422	-0,14987	-0,34104	0,34979	1													
Stars	0,26187	-0,45175	-0,28298	-0,00804	0,3592	-0,16071	1												
Guests 2021	-0,23646	0,12748	0	-0,40818	0,13079	0,30233	0,23035	1											
Guests 2022	0,07382	-0,40325	0,2659	0,05663	-0,12521	-0,23071	-0,00479	0,324661986	1										
Guests 2023	-0,29451	0,05774	0,70428	-0,35947	0,28137	-0,36515	-0,02608	-0,294392029	0,024507154	1									
Days 2021	-0,19635	0,18146	-0,11965	-0,15064	-0,19134	0,35465	-0,02277	0,873852325	0,243910679	-0,488901207	1								
Days 2022	-0,21654	-0,30406	0,47975	-0,01545	0,03899	-0,19746	-0,05396	0,110743627	0,829713368	0,275863424	0,07006	1							
Days 2023	-0,49437	0,1838	0,50903	-0,54931	0,28287	-0,02906	-0,29892	-0,37488737	-0,327685288	0,700385994	-0,49658	-0,05589	1						
Exp 2021	-0,05633	-0,19232	-0,22025	-0,04322	0,44656	0,43613	0,32466	0,361293215	0,421070364	-0,444148353	0,24898	0,2814	-0,44652	1					
Exp 2022	0,27824	-0,09	0,3165	0,07471	-0,13851	-0,30437	0,21684	0,203960781	0,513616396	-0,057735027	0,18549	0,5864	-0,37496	0,27128	1				
Exp 2023	0,21556	-0,04226	0,14861	-0,09522	0,0289	-0,38419	0,18454	-0,646418706	-0,562038536	0,325300024	-0,67592	-0,36099	0,4971	-0,41633	-0,06761	1			
ESP 2021	-0,05355	-0,05774	-0,45683	0,09244	-0,08885	0,06847	0,36515	0,294392029	-0,343100157	-0,133333333	0,33757	-0,43887	-0,14857	-0,31558	-0,3926	-0,11386	1		
ESP 2022	-0,31265	0,10113	-0,35564	-0,08395	0,15564	0,39975	0,35026	0,343775825	-0,329109189	-0,27247463	0,38061	-0,27821	-0,22306	-0,06824	-0,36407	-0,17094	0,7785	1	
E.F.P	0,0938	-0,3371	-0,35564	0,07196	0,38044	-0,11993	0,7462	1,90834E-17	-0,143090952	-0,27247463	-0,14952	-0,08786	-0,22306	0,28662	0,16181	0,32289	0,27247	0,40909	1

Table 3

Tourists

Following the data coding and the correlation matrix analysis being performed (as seen in table 4), various positive (therefore between 0,7 and 1) correlations were unveiled. To begin with, the strongest of which were: "Average expenditure in 2022" with "Average expenditure in 2023" (0,79), "Days of summer vacation in 2021" with "Days of summer vacation in 2022" (0,76), "Other days of days off in 2021" with "other days off in 2022" (0,76), "Average expenditure in 2021"

with "Average expenditure in 2022" (0,74), "Eating-out in 2021" with "Eating-out in 2022" (0,73), "Family members in 2021" with "Family members in 2022" (0,72).

A moderate positive relationship- therefore, values between 0,4 to 0,7- that is worth mentioning is "Income range". This variable is positively correlated with "Education level" (0,45), as well as with "Expenditure" (0,5) for all three years (so 2021,2022 and 2023).

Moreover, in this matrix, the only negative moderate relationships were two. The first was between "Age group" of individuals with "Sector of employment" (-0,43), while the second was "Income range" with "Sector of employment" (-0,43). There are two pairs that are of particular interest for this analysis among the aforementioned correlation pairs, both of which pertain to the income range of the tourists. First, how the income range positively correlates with education. Therefore, as the education level rises (towards Ph.D.), the income also tends to rise (towards the income range "more than 40.000€"). The second pair of values is income range and expenditure (for all three years that are of interest hereby, so 2021, 2022 and 2023). This means that as income rises, the expenditure of tourists also rises (towards the highest value "more than 800€").

Last, regarding the variables such as "days off", "eating-out", "change in days spend by guests" etc., which easily correlate with each other in reference to the year, so for example, "eating-out in 2022" presented a high correlation with "eating-out in 2021", this can be explained due to the little variation between the variables. Furthermore, this signifies little variation in tourists' habits such as expenditure for their summer vacation, and other spending habits like eating out.

Table 4

	Country	Gender	Age group	Income range	Occupation	Sector	Education	Days off summer 2021	Days off summer 2022	Days off summer 2023	Family members 2021	Family members 2022	Expenditure 2021	Expenditure 2022	Expenditure 2023	Tourist activity change	TA vs Indiv.	Other days off 2021	Other days off 2022	Other days off 2023	Ac. 2021	Ac. 2022	Ac. 2023	Trans. 2021	Trans. 2022	Trans. 2023	Est 2021	Est 2022	Est 2023	Covid financ	E.C Financ	David financ	Wind turbins disturbar	HESP
Country	1																																	
Gender	0.18051	1																																
Age group	0.11938	0.0172	1																															
Income range	0.23324	0.23584	0.39029	1																														
Occupation	0.02378	0.05121	0.00892	0.09292	1																													
Sector	0.02603	0.14527	0.43466	0.43298	0.34038	1																												
Education	0.10005	0.11743	0.21597	0.45065	0.03003	0.30493	1																											
Days off summer 2021	0.004	0.06335	0.09474	0.01351	0.14407	0.06122	0.04629	1																										
Days off summer 2022	0.06185	0.03106	0.18736	0.05096	0.24465	0.01566	0.07077	0.7637050989	1																									
Days off summer 2023	0.00652	0.02978	0.12582	0.0804	0.14176	0.07144	0.05624	0.354406935	0.27048	1																								
Family members 2021	0.05542	0.04116	0.11528	0.09328	0.07221	0.00101	0.04506	0.332151697	0.1556	0.14651	1																							
Family members 2022	0.04115	0.08205	0.10179	0.16693	0.13552	0.01403	0.03538	0.172702202	0.25883	0.11537	0.18572	1																						
Expenditure 2021	0.02311	0.14043	0.14543	0.51128	0.12044	0.17488	0.35304	0.155639932	0.06828	0.1637	0.10362	1																						
Expenditure 2022	0.13523	0.1019	0.24849	0.54548	0.03411	0.16568	0.30288	0.071317393	0.15384	0.11537	0.74461	1																						
Expenditure 2023	0.05714	0.08916	0.30156	0.57499	0.1545	0.26358	0.33947	0.005141615	0.08563	0.09709	0.14091	0.68517	1																					
Tourist activity change	0.09732	0.05922	0.11193	0.05857	0.02097	0.03589	0.05736	0.056416151	0.08133	0.10787	0.01054	0.0994	0.11862	0.787737654	1																			
TA vs Indiv.	0.04574	0.20486	0.10337	0.02324	0.08492	0.10827	0.09725	0.134950456	0.07	0.02111	0.0396	0.05109	0.03653	0.045141522	0.06111	1																		
Other days off 2021	0.0134	0.10264	0.06671	0.11624	0.06878	0.0526	0.04148	0.294156969	0.18015	0.07627	0.04845	0.00512	0.01664	0.153610331	0.16917	0.22001	1																	
Other days off 2022	0.03664	0.11894	0.01978	0.01949	0.11172	0.04696	0.00763	0.240504822	0.27078	0.09722	0.08537	0.071	0.00736	0.053745837	0.08686	0.19658	0.12175	1																
Other days off 2023	0.05164	0.01559	0.12575	0.23865	0.15082	0.11692	0.20015	0.067432527	0.07834	0.42409	0.1265	0.11417	0.19387	0.189442726	0.16396	0.09958	0.03006	0.30813	1															
Ac. 2021	0.17475	0.07166	0.12791	0.10531	0.07412	0.0179	0.12616	0.009244816	0.0722	0.01655	0.03145	0.05186	0.26513	0.125294506	0.05186	0.0901	0.14604				1													
Ac. 2022	0.11958	0.03089	0.01966	0.07914	0.04197	0.06925	0.06075	0.009943353	0.09354	0.01992	0.13322	0.13317	0.304750564	0.16442	0.15707	0.13006	0.011178797	0.00541			0.43341	1												
Ac. 2023	0.08415	0.00732	0.09685	0.16694	0.03747	0.08551	0.05913	0.063935587	0.12799	0.07204	0.01192	0.11708	0.155440537	0.26789	0.12399	0.07993	0.047124417	0.03641	0.21447	0.38628	1													
Trans. 2021	0.06709	0.03379	0.14608	0.04844	0.04125	0.01209	0.03313	0.024758110	0.02471	0.05206	0.10919	0.10531	0.110964523	0.06545	0.12831	0.11881	0.047820744	0.062	0.08222	0.13159	0.21456	0.05363	0.11443	1										
Trans. 2022	0.03907	0.05331	0.09104	0.11453	0.01382	0.048848	0.030492163	0.02415	0.05974	0.10193	0.05483	0.001910968	0.01294	0.03218	0.16405	0.056509362	0.06623	0.13137	0.0583	0.26366	0.4152	1												
Trans. 2023	0.01463	0.05995	0.2242	0.02029	0.06681	0.000095	0.10131	0.04449	0.00014	0.06804	0.06789	0.114450852	0.0178	0.05081	0.09872	0.012745408	0.01608	0.13195	0.4574	0.472563	1													
Est 2021	0.07327	0.14623	0.04081	0.11288	0.09876	0.06682	0.10712	0.09447	0.03621	0.28904	0.259159307	0.2323	0.04145	0.01169	0.038016442	0.17414	0.04063	0.03754	0.17798	0.00149	0.20816	1												
Est 2022	0.01575	0.20032	0.04168	0.23092	0.03793	0.06786	0.17548	0.017434455	0.00281	0.00136	0.01639	0.32138	0.220658719	0.2728	0.02469	0.01492	0.110053994	0.0335	0.15561	0.13396	0.00152	0.12235	0.72853	1										
Est 2023	0.06444	0.12939	0.01271	0.14004	0.03137	0.00971	0.10884	0.022781182	0.01752	0.05002	0.0021	0.17365	0.156600681	0.21322	0.09922	0.10453	0.091222039	0.14871	0.0797	0.04858	0.18773	0.3738	0.677217	1										
Covid financ	0.02553	0.00189	0.10775	0.06768	0.12004	0.03437	0.23118	0.063506303	0.10919	0.02269	0.05006	0.02477	0.0631	0.042081281	0.07646	0.18851	0.09959	0.05284	0.0314	0.04734	0.210051	0.14275	0.15646	0.14476	1311	1								
E.C Financ	0.01388	0.02683	0.06707	0.00172	0.03145	0.0695	0.0513	0.037499691	0.01996	0.00455	0.03401	0.02996	0.004470467	0.02054	0.07276	0.11756	0.085159786	0.05203	0.04432	0.02171	0.0619	0.12694	0.16099	0.02145	0.0027	0.009962	0.98115	1						
David financ	0.07928	0.0395	0.05157	0.09596	0.0176	0.05976	0.008887539	0.07188	0.02862	0.01584	0.0152	0.069124004	0.13816	0.23572	0.0724	0.056555118	0.08353	0.04862	0.02378	0.11352	0.07323	0.0811	0.01129	0.01762	0.00414	0.03343	0.00691	0.08795	1					
Wind turbins disturbar	0.00041	0.07268	0.24608	0.04724	0.08403	0.20329	0.05858	0.121361919	0.20652	0.15991	0.02366	0.07039	0.110178912	0.05662	0.03761	0.03832	0.069344549	0.09899	0.02354	0.13897	0.11143	0.07189	0.0615	0.02003	0.06518	0.08192	0.02776	0.04847	0.02356	1				
HESP	0.03218	0.07221	0.10638	0.00045	0.20727	0.14232	0.13563	0.000994497	0.05726	0.05209	0.09517	0.14077	0.03941	0.088307595	0.05117	0.10052	0.14915	0.046206098	0.0321	0.0089	0.02506	0.05384	0.10184	0.05769	0.00908	0.06386	0.0314	0.07211	0.09506	0.16057	0.01164	0.02037		

<p style="text-align: center;"><u>Regression Analysis</u></p>

<u>Accommodations</u>

1st model

As seen in the table below, the first model pertained to the "change in number of days in 2023". The R-squared signifies that 99% of the dependent data can be explained by this model. More specifically, this measure demonstrates how much of the regression's dependent variable's (days 2023) variance the independent variables are responsible for explaining. Then, significance F (=0.0004) is lower than a (=0.05), which means that this model is a good and a reliable one. Then, the coefficients were all positive but three. More precisely, "education level of managers, "quality stars of the accommodation" and "specialization of the studies of the managers", had a negative relationship with the dependent variable. Last, examining the p-values of the variables, only one is (barely) statistically insignificant, and therefore described an independency between "number of days spend by guests in 2023" and "environmentally friendly practices". All other variables had a p-value smaller than a (=0.05), thereby rejecting the null hypothesis (as seen in the methodology part), which signifies that there was a dependency between the dependent and the independent variables.

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0,9968
R Square	0,9936
Adjusted R Square	0,98081
Standard Error	0,09541
Observations	13

ANOVA

	df	SS	MS	F	Significance F
Regression	8	5,65589	0,70699	77,6631	0,000403991
Residual	4	0,03641	0,0091		
Total	12	5,69231			

	Coefficients	Standard Err	t Stat	P-value	Lower 95%	Upper 95%	Lower 95,0%	Upper 95,0%
Intercept	-1,12347	0,36445	-3,08262	0,03684	-2,1353545	-0,11159	-2,13535	-0,11159
Exp 2023	0,33979	0,05302	6,40828	0,00305	0,192572136	0,48701	0,19257	0,48701
Guests 2023	1,78559	0,17143	10,4158	0,00048	1,309622511	2,26155	1,30962	2,26155
Educ	-1,20885	0,14033	-8,61458	0,001	-1,598460489	-0,81924	-1,59846	-0,81924
Stars	-0,58117	0,05883	-9,87866	0,00059	-0,744504609	-0,41783	-0,7445	-0,41783
E.F.P	0,40779	0,15417	2,64499	0,05728	-0,020266819	0,83585	-0,02027	0,83585
Special	-0,47152	0,04108	-11,4783	0,00033	-0,58556928	-0,35746	-0,58557	-0,35746
Exp 2022	0,13277	0,04825	2,75159	0,05129	-0,001199504	0,26675	-0,0012	0,26675
Days 2022	0,14623	0,04627	3,16016	0,03418	0,017756015	0,27471	0,01776	0,27471

Table 5

2nd model

As witnessed in the following results, the second model's dependent variable
was "change in expenditure of guests 2023". The R-squared signifies that 97% of
the dependent data can be explained by this model, therefore, alongside the
Significance F (=0.008) being lower than a, implying that the model is a reliable
one. In reference to the coefficients, four of them insinuate a negative
relationship to the dependent variable (change in number of guests 2023,
environmentally friendly practices, change in expenditure spend by guests 2022,
change in number of days spend by guests 2022), while the rest a positive
relationship. Analyzing the p-values, all variables but one (the "environmentally
friendly practices") had a value less than 0,05, thereby rejecting the null
hypothesis, suggesting than all other independent variables have a direct
relationship with the independent variable.

SUMMARY OUTPUT

Regression Statistics

Multiple R	0,98506
R Square	0,97035
Adjusted R Square	0,91105
Standard Error	0,26804
Observations	13

ANOVA

	df	SS	MS	F	Significance F
Regression	8	9,40492	1,17561	16,3626	0,008282166
Residual	4	0,28739	0,07185		
Total	12	9,69231			

	Coefficients	Standard Err	t Stat	P-value	Lower 95%	Upper 95%	Lower 95,0%	Upper 95,0%
Intercept	2,90456	1,19569	2,4292	0,07204	-0,41519576	6,22432	-0,4152	6,22432
Guests 2023	-4,6759	1,0281	-4,5481	0,01043	-7,53032498	-1,8214	-7,5303	-1,8214
Days 2023	2,68179	0,41849	6,40828	0,00305	1,519879168	3,8437	1,51988	3,8437
Educ	3,27389	0,59934	5,46253	0,00546	1,609868384	4,93792	1,60987	4,93792
Stars	1,53219	0,32687	4,68751	0,0094	0,624664307	2,43972	0,62466	2,43972
E.F.P	-0,9351	0,5451	-1,7154	0,16142	-2,4485077	0,57839	-2,4485	0,57839
Special	1,27736	0,20998	6,08337	0,00369	0,694372286	1,86034	0,69437	1,86034
Exp 2022	-0,3385	0,15657	-2,1621	0,09667	-0,77321109	0,09619	-0,7732	0,09619
Days 2022	-0,4465	0,09619	-4,6417	0,00972	-0,71356895	-0,1794	-0,7136	-0,1794

Table 6

3rd model

The third model's dependent variable was "change in number of guests in 2023". The R-squared in this model was a strong 99.5%, indicating the model can explain 99.5% of the dependent data. This, together with the Significance F (=0.002) being smaller than a, suggests that the model is trustworthy. Four of the coefficients suggest a negative link to the dependent variable (environmentally friendly practices, expenditure of 2021, expenditure of 2023 and days 2022), whereas the remaining suggest a positive association. By analyzing the p-values, it was found that all variables, with the exception of one (the "days spend by guests in 2022") had values less than 0,05, rejecting the null hypothesis and indicating that all other independent factors are directly related to the independent variable.

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0,99761
R Square	0,99523
Adjusted R Square	0,98568
Standard Error	0,05248
Observations	13

ANOVA

	df	SS	MS	F	Significance F
Regression	8	2,29668	0,28708	104,256	0,000225649
Residual	4	0,01101	0,00275		
Total	12	2,30769			

	Coefficients	Standard Err	t Stat	P-value	Lower 95%	Upper 95%	Lower 95,0%	Upper 95,0%
Intercept	0,67457	0,14788	4,56172	0,01033	0,263999525	1,08514	0,264	1,08514
Days 2023	0,54013	0,05186	10,4158	0,00048	0,396149564	0,6841	0,39615	0,6841
Educ	0,67438	0,05263	12,8142	0,00021	0,528260177	0,8205	0,52826	0,8205
Stars	0,32307	0,02225	14,5194	0,00013	0,261292082	0,38485	0,26129	0,38485
E.F.P	-0,23589	0,07652	-3,08286	0,03683	-0,448332792	-0,02345	-0,44833	-0,02345
Special	0,2591	0,02325	11,1451	0,00037	0,19455273	0,32364	0,19455	0,32364
Exp 2022	-0,07941	0,02147	-3,69809	0,02087	-0,139024621	-0,01979	-0,13902	-0,01979
Exp 2023	-0,17921	0,0394	-4,54809	0,01043	-0,288609853	-0,06981	-0,28861	-0,06981
Days 2022	-0,07585	0,02875	-2,63869	0,05766	-0,155666939	0,00396	-0,15567	0,00396

Table 7

Tourists

1st model

The first model, in regard to the tourists' data, addressed the "number of summer vacation days in 2023," as can be seen in the table below. The R-squared value indicates that this model can account for 41% of the dependent data. This measure shows how much of the variance of the days 2023, the dependent variable of the regression, is explained by the independent factors. As a result, significant F (=0.0002) is less than a (=0.05), indicating the accuracy and dependability of this model. After that, all but three of the coefficients were positive. More specifically, the dependent variable had a negative connection with the "expenditure of 2021", "accommodation type in 2021" and "other days off in 2022". Last but not least, when looking at the p-values of the variables, all were statistically significant, indicating that there was in fact correlation between the dependent and independent variables.

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0,64136
R Square	0,41134
Adjusted R Square	0,38766
Standard Error	1,94131
Observations	182

ANOVA

	df	SS	MS	F	gnificance F
Regression	7	458,227	65,461	17,3697	2,4E-17
Residual	174	655,751	3,76868		
Total	181	1113,98			

	Coefficient	tandard Err	t Stat	P-value	Lower 95%	Upper 95%	ower 95,0	pper 95,0%
Intercept	1,70733	0,44022	3,87831	0,00015	0,83846	2,57619	0,83846	2,57619
Other days off 2023	0,45335	0,06254	7,24901	1,3E-11	0,32991	0,57678	0,32991	0,57678
Days off summer 2022	0,61719	0,09748	6,33155	2E-09	0,4248	0,80958	0,4248	0,80958
Expenditure 2021	-0,2762	0,07469	-3,6983	0,00029	-0,4237	-0,1288	-0,4237	-0,1288
Expenditure 2023	0,16495	0,06928	2,38097	0,01835	0,02822	0,30169	0,02822	0,30169
Ac. 2021	-0,2124	0,06066	-3,5021	0,00059	-0,3322	-0,0927	-0,3322	-0,0927
Age group	0,32757	0,13526	2,42168	0,01648	0,0606	0,59453	0,0606	0,59453
Other days off 2022	-0,2598	0,12015	-2,1626	0,03194	-0,497	-0,0227	-0,497	-0,0227

Table 8

***2nd* model**

As can be seen from the data below, the second model's dependent variable was "Expenditure of Guests in 2023". The R-squared indicates that this model can explain 74% of the dependent data, and the Significance F (=0.0002) is smaller than a, indicating that the model is credible. Four of the coefficients (accommodation type in 2023, occupation of participants, days of summer vacation in 2021 and financial impact of covid) imply a negative relationship to the dependent variable, while the remaining imply a positive relationship. By analyzing the p-values, it was found that all variables had values less than 0,05, rejecting the null hypothesis and indicating that all independent factors are directly related to the independent variable.

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0,86366
R Square	0,74591
Adjusted R Square	0,73105
Standard Error	1,53734
Observations	182

ANOVA

	df	SS	MS	F	Significance F
Regression	10	1186,43	118,643	50,1999	1,04983E-45
Residual	171	404,143	2,36341		
Total	181	1590,57			

	Coefficient	Standard Err	t Stat	P-value	Lower 95%	Upper 95%	Lower 95,0%	Upper 95,0%
Intercept	0,55607	0,51981	1,06976	0,28623	-0,46999402	1,58213	-0,47	1,58213
Income range	0,25935	0,09879	2,62523	0,00944	0,064342329	0,45436	0,06434	0,45436
Days off summer 2023	0,20708	0,05	4,14181	5,4E-05	0,108387586	0,30577	0,10839	0,30577
Expenditure 2021	0,33039	0,06856	4,81875	3,2E-06	0,195048795	0,46573	0,19505	0,46573
Expenditure 2022	0,48457	0,06213	7,79968	5,8E-13	0,361935814	0,6072	0,36194	0,6072
Tourist activity changed-COVID	0,13425	0,04044	3,31945	0,0011	0,054417268	0,21408	0,05442	0,21408
Ac. 2023	-0,1253	0,03177	-3,9448	0,00012	-0,18805587	-0,0626	-0,1881	-0,0626
Occupation	-0,0942	0,03449	-2,7312	0,00697	-0,16228977	-0,0261	-0,1623	-0,0261
Days off summer 2021	-0,1862	0,07452	-2,4988	0,01341	-0,33331202	-0,0391	-0,3333	-0,0391
Ac. 2021	0,15621	0,04784	3,26553	0,00132	0,061784588	0,25063	0,06178	0,25063
Covid-financ	-0,1044	0,04885	-2,1379	0,03394	-0,20084797	-0,008	-0,2008	-0,008

Table 9

3rd model

"Income range" was the dependent variable for the third model. This model's R-squared amounted to 56%, which means that this model can explain 56% of the dependent data. This shows that the model is reliable, as does the fact that the Significance F (=0.0002) is less than a. Sector of employment, gender and other days off in 2023, are the three coefficients that show a negative link to the dependent variable, whereas all other suggest a positive association. All variables had p-values less than 0,05, rejecting the null hypothesis and showing that all independent factors are directly related to the independent variable, according to an analysis of the p-values.

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0,75072
R Square	0,56359
Adjusted R Square	0,54075
Standard Error	0,97006
Observations	182

ANOVA

	df	SS	MS	F	Significance F
Regression	9	209,023	23,2247	24,6802	8,26864E-27
Residual	172	161,856	0,94103		
Total	181	370,879			

	Coefficients	Standard Err	t Stat	P-value	Lower 95%	Upper 95%	Lower 95,0%	Upper 95,0%
Intercept	0,86175	0,3137	2,74709	0,00665	0,242561569	1,48095	0,24256	1,48095
Country	0,15572	0,03947	3,94538	0,00012	0,077813797	0,23362	0,07781	0,23362
Sector	-0,5518	0,17104	-3,2262	0,0015	-0,88941036	-0,2142	-0,8894	-0,2142
Education	0,22823	0,09004	2,53465	0,01215	0,050496917	0,40596	0,0505	0,40596
Expenditure 2023	0,13401	0,03461	3,87199	0,00015	0,065692721	0,20232	0,06569	0,20232
Gender	-0,3333	0,14934	-2,2315	0,02694	-0,62803056	-0,0385	-0,628	-0,0385
Age group	0,20487	0,07216	2,83925	0,00507	0,06244426	0,3473	0,06244	0,3473
Expenditure 2021	0,0813	0,03617	2,24749	0,02588	0,009898608	0,1527	0,0099	0,1527
Trans. 2022	0,07801	0,03487	2,23718	0,02656	0,009182204	0,14684	0,00918	0,14684
Other days off 2023	-0,0608	0,02983	-2,0385	0,04303	-0,11968776	-0,0019	-0,1197	-0,0019

Table 10

Discussion

The aim of the current investigation was to determine whether and how the energy crisis has impacted the tourism sector, with the focus been on tourists and the accommodation industry. Initially, examining the responses from the direct enquiries posed on both groups in the survey questionnaires, it became evident that both parties were affected by the higher energy prices. More specifically, over 90% of accommodation managers have reported negative outcomes to their businesses, while 80% of individuals experienced a range of effects on their financial state. Not only that but, regarding the lodging businesses, due to higher expenses the average expenditure per stay of guests in 2023, is expected and already noticed to be higher than the initial year of the energy crisis, i.e., 2022. This augmentation in prices can be explained either by the general inflation and inflationary pressures in prices of commodities, or by a

change in days of summer vacation. On the other hand, for tourists, the variation in expenditure for summer vacation between the two aforementioned years is little to none, as the percentages (presented in the graph previously in this section) remained highly similar. Furthermore, these inflationary pressures are an indirect effect of the energy crisis on the tourism sector, which also began during the first COVID-19 lockdown, globally (around April 2020), when energy prices were noticeably higher.

Additionally, in regard to the expected habits of the 2023 summer season, the majority of managers have stated that they anticipate rising demand for hotels as well as other goods and services. Moreover, some foresee a rise in the number of excursions to neighboring locations, one management has stated that they anticipate things to return to normal completely after the COVID-19 pandemic, while others anticipate an increase in the length of visitors' stays and another manager anticipates a rise in the number of tourists who like to eat out. Finally, one management reported that they anticipate their guests will be "demanding and anticipating perfect service and facilities" due to exorbitant costs for the final category, i.e., guests' mood. According to another manager, visitors want to "live like a local," therefore they anticipate more customized services and "greener practices" from the lodging. Finally, one management anticipates that visitors will pay closer attention to the level of enjoyment they achieve when visiting.

Moreover, another factor worth mentioning for the accommodations is the fact that, since the Greek tourism sector is heavily relied on foreign tourists, the variation in terms of budget, consumption elasticity, preferences and patterns of consumption can have an influence on important variables such as the number of summer vacation days, expenditure spend etc. These variables play a significant role for the tourism sector concerning profitability.

Regarding the regression analyses, these demonstrate that the dependent variables explain in high percentages the independent variables (days spend by guests, expenditure, number of guests- all in 2023), which are predominant for the tourism sector, as well as in extracting important results and therefore safe conclusions for the future.

From the above descriptive statistics as well as correlation and regression

analyses, several results and conclusions can be made. To begin with, in regard to the accommodation businesses, the general forecast indicates that for the upcoming season of 2023, an increase in number of guests (a 50% growth in average, compared to the 2022 season), an increase in number of days spend by guests in 2023 (225% growth from 2022), as well as in expenditure spend by guests in 2023 (120% growth) are expected by lodging managers. These forecasts are exceptionally positive for the Greek tourism, as the indices mentioned are highly influential for the further development and rebound of the sector.

From the perspective of the tourists, an overwhelming 90% are expected to vacation in 2023. Moreover, from the aforementioned percentage of the participants who will vacation, 13% were unaware of the number of days which will be spent on vacationing. Furthermore, other significant indices insinuating growth for the tourism sector were expenditure of guests in 2023, which remained at the same levels, implying that the budget (for the majority of the individuals) was not deceased but rather stayed the same, even though 80% experienced a variety of financial impacts due to the energy crisis and the higher prices. In addition, 80% of the participants were not willing to sacrifice their vacation.

Then, focusing more on the tourists and while examining the enquiry regarding which goods consumers would rather abstain from not consuming in order to save money from, only 20% of individuals responded that they rather give up trips or vacations, for this purpose. Therefore, a rather low percentage of people would not vacation. On the contrary, the rest 80% of the respondents would rather alter their consumption and preferences in goods such as accommodation type, eating-out, transportation and other habits, while sacrificing other commodities.

When tourists were asked how the summers of 2022 and 2023 would compare, a significant number of them said they anticipated "no change" at all for the latter. The remaining categories were listed in descending order as follows: "change in number of days", "change in expenses" (some people anticipate higher prices and reduced budgets, while others have stated that they are in a position to dispose of a higher budget for their 2023 vacation), "change in destination", "change in

activities and/or night life", "change in COVID-related habits", "change in vacation status", "unknown changes yet" (no prediction), "change in vacation status," and "change in vacation status".

Last, with reference to the impact that the energy crisis had on individuals (among other factors), 92% of the participants responded that they use a form of energy saving technique or practice at home, in order to reduce their bills and/or other environmental reasoning.

Common enquiries between the questionnaires and results

Between the two questionnaires, there were some questions which were common, but rephrased for the purposes of each analysis.

The first common bundle of enquiries was that of "days of summer vacation". Regarding the accommodations' questionnaire, comparing the average number of days spend by guests (measured in percentage change) in 2021 (-21%) with that of 2022 (4%) respectively, the change was 119% of an increase. The percentage between 2022 and 2023 correspondingly amounted to a 225% growth. In reference to the average days of summer vacation by tourists (measured in raw number), the change was -5.5% between the seasons of 2021 and 2022. For the summer period of 2022 and 2023, the average change amounted to 0%, i.e., no change in days. However, for the latter, 13% of the participants responded that they were unsure regarding the number of days in question. Therefore, observing the two questionnaires' results, a differentiation is evident. But it is worth noting that some (if not all lodging places) accommodate also foreign guests/tourists, unlike the participants in the tourists' questionnaire, which in the majority were Greek (more than 80%).

The second common bundle of enquiries pertained to "guests' habits". Extracting information from the accommodations' as well as tourists' questionnaires and comparing the qualitative data between 2021 and 2022, four categories were common. These were: "eating-out" for which both tourists and managers experienced an increase to, "excursions (to nearby places)" for which both have

responded with a general increase, "COVID-19" which from both perspectives there was a relaxation of the protective measures, and last "days of vacation" for which there was a contradiction. Tourists reported less days, while managers more. The last category can be explained due to accommodations having foreign tourist, while the participants of the tourists' questionnaire were mostly Greek. Comparing the data between 2022 and the expectations for the 2023 summer season, the four previous categories are once again common. Regarding "eating out" the lodging managers expect an increase in that regard, while from the side of tourists there will be a moderate increase. For "excursions" both sides expect an increase, while pertaining to "COVID-19" guests and tourists were expected to follow no measures at all. Last, in reference to "vacation days" even though the managers expect a rise, tourists on the other hand will experience a duality. More specifically, some expect an increase, while others a decrease due to inflated prices. Therefore, income is a strong indicator not only for the budget, but also for the amount of vacation days.

Last, the third common bundle of enquiries pertain to "expenditure". The average change in expenditure of guests per stay between 2021 and 2022, as experienced by accommodation managers, amounted to a 138% increase. For the years 2022 and 2023, the increase was expected to rise by 120%. In regard to the tourists' responses, the most dominant budget range between 2021 and 2022 was "more than 800€". The change for the years in question was a positive 26% of an increase. For the summer seasons of 2022 and 2023 the same range, i.e., "more than 800€", the change was a 4% increase.

Chapter 5

<u>Conclusion</u>

The effects and outcomes, which an energy crisis can have on an economic system historically may be easily detected on the economy in a short-term or mid-term period of time, from disruptions on important indices like inflation or inflationary pressures to bigger macro-economic aggregates, such as interest rates and GDP. The present study examined the tourism sector, being one of the most significant and profitable sectors and industry for economies worldwide. The energy crisis analyzed hereby, which began in early 2022, was not only a direct effect of the Russian-Ukrainian war and consequently the war, but also an indirect effect of an event prior to that, i.e., the COVID-19 pandemic. The latter is a crucial point in the investigation of the tourism sector, since -in contrast to previous energy crises- the pandemic affected economies in a direct way (due to the lockdowns) as well as in an indirect way, for vacations, trips and travels were suspended momentarily and the summer seasons 2020 and 2021 were majorly affected in terms of net income.

The present study found that, by getting an inside from both ends of a principal touristic transaction (meaning tourists and accommodation managers), no major step back will take place in the upcoming summer season 2023 with reference to the percentage of individuals who express interest and/or actively plan their vacation as well as the bookings already been made and also predictions and forecasts regarding the preferences as well as the behaviors of tourists, by the lodging businesses. Moreover, the former group was less willing to sacrifice their vacations in spite of the general higher costs and whether they are perceived this way. Furthermore, all three regression models in regard to the accommodation businesses were reliable and the results presented in them were also statistically significant. Last but not least, pertaining to the three models for the tourists, these were also reliable, the data were slightly less explained, however the

variables were statistically significant to the degree to best describe the intercept.

Previous works and studies were either focusing on the accommodation businesses with a focus solely on hotels, not taking into account other types of lodging, which in the study hereby were highly popular by the tourists. In this study, both groups were explored in order to extract a safe and well-rounded conclusion for the tourism sector, from both points of view.

Last but not least, as seen in the literature review and also for the lodging managers data from the survey questionnaire, the number of guests/tourists for the upcoming 2023 summer period, look more than promising. Certainly, last-minute cancellations are expected to occur, however it is not a recent phenomenon and unequivocally when happening in small numbers this has minimally to no effect on the overall performance of tourism. Therefore, major risks like decreased revenue for the sector, reduced number of tourists, lower consumption of tourism products (whether or not energy-induced) are not expected. On the contrary, these indices are anticipated to grow, in comparison to the 2020 and 2021 (summer seasons under COVID-19 and the consequences on prices of energy products) as well as 2022 (the summer season where the major outbreak of the energy crisis actualized).

As evident from the analysis, it has been detected that although the energy crisis affected both the individuals as well as the businesses, the recovery of the tourism sector primarily from COVID-19 and secondary from the financial impacts of the inflationary crisis of energy, demonstrates resilience. Furthermore, it is also worth mentioning that an important factor primely for the governments to begin implementing is sustainable energy. That is because a more diversified portfolio of energy supply based on green energy is not only profitable and fruitful for countries and businesses in general, but also for the environment.

Limitations

Due to lack of an international audience, the hereby study present a more accurate description of the Greek tourists and accommodations, even though for the last one it is known that lodging businesses are accommodating a plethora of foreign tourists, hence the managers obtain a better point of view. Therefore, a study as such would be more fruitful for future analysis, to gain international participants, in order to measure the reaction of tourists worldwide.

Future research

As mentioned previously, for future research purposes, it would be constructive to include a more diversified set of participants (nationality-wise), and certainly in higher numbers. A comparison between these differentiated groups and backgrounds would have been a useful addition to the literature and overall study of this field. Moreover, an important area of study, would be how the tourism businesses (including accommodation, food and beverage ventures and other types of establishments) were affected by the disruptions in the supply chain, due to the energy crisis and its direct or indirect consequences.

Appendix A

Accommodations Descriptive Statistics Graphs

Graph 1

Graph 2

Education level

7,69%   7,69%

30,77%

53,85%

■ High School   ■ Bachelor's degree   ■ Master's degree   ■ Other

Graph 3

Year of establishment

7,69%

30,77%

30,77%

30,77%

■ 1979-1989   ■ 1990-1999   ■ 2000-2010   ■ 2011- 2020

Graph 4

Accommodation type

23,08%

46,15%

15,38%

15,38%

■ Hotel   ■ Airbnb   ■ Resort   ■ Rooms/Apartments to rent
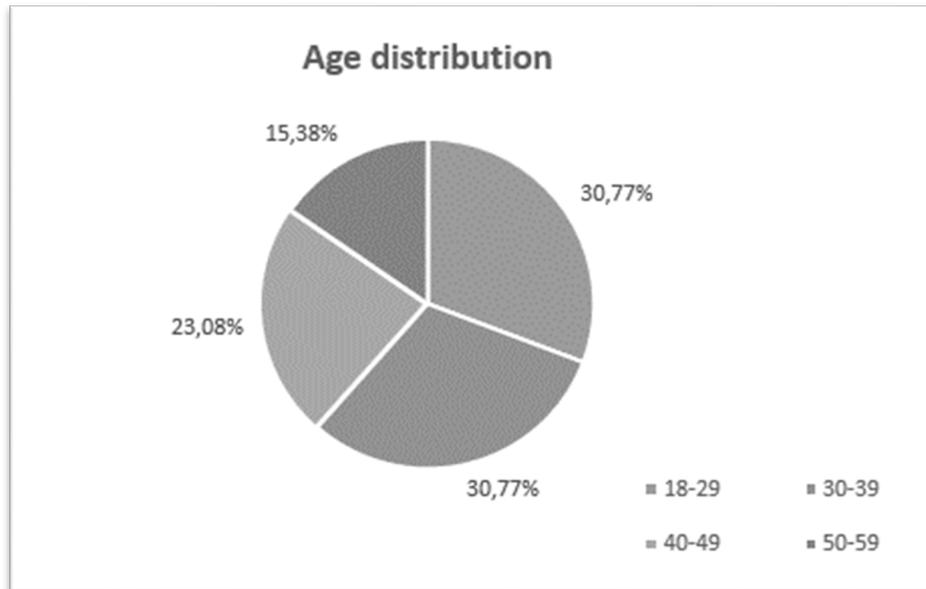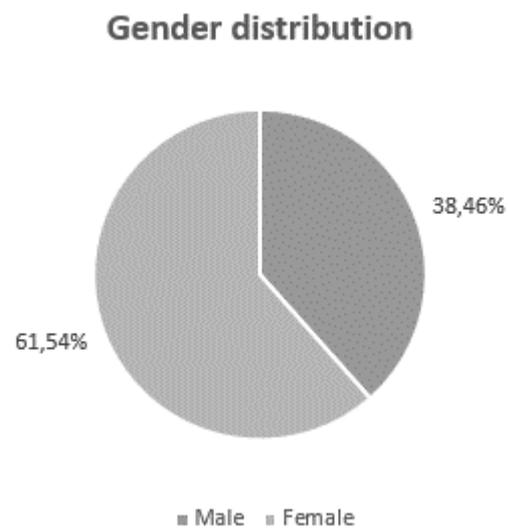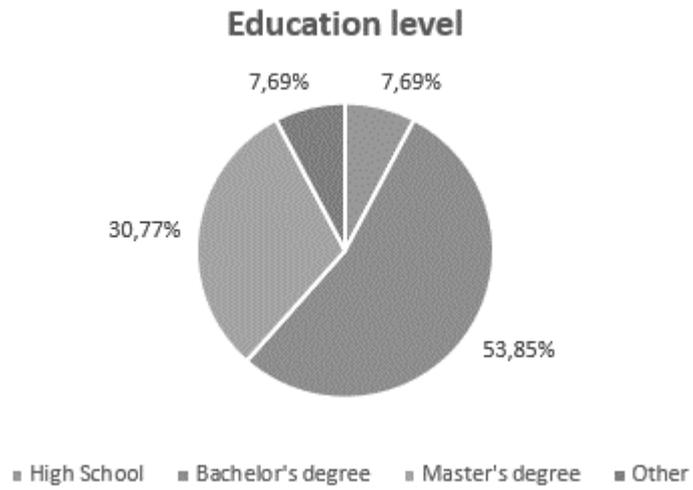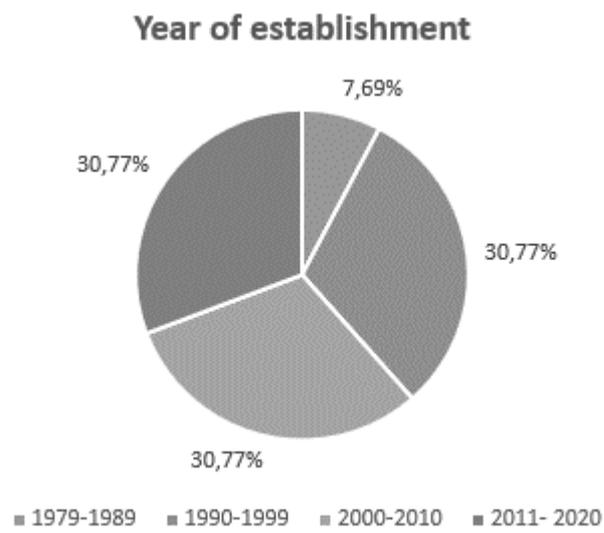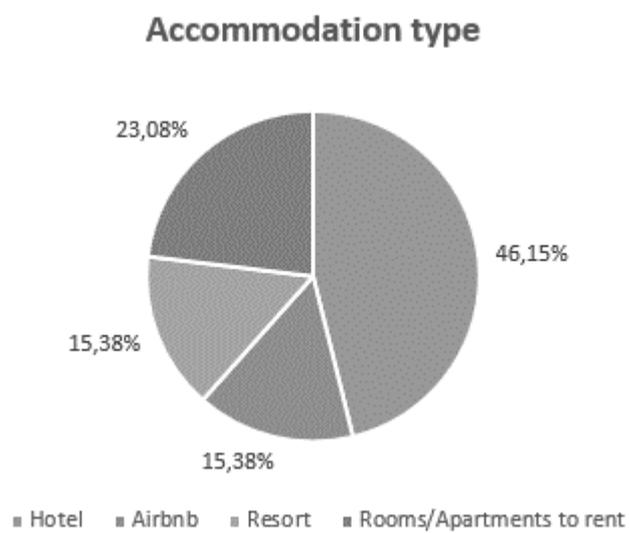
Graph 5

Change in number of guests 2021

- 60% to 40% decrease
- 39% to 10% decrease
- 0%
- 1% to 24% increase
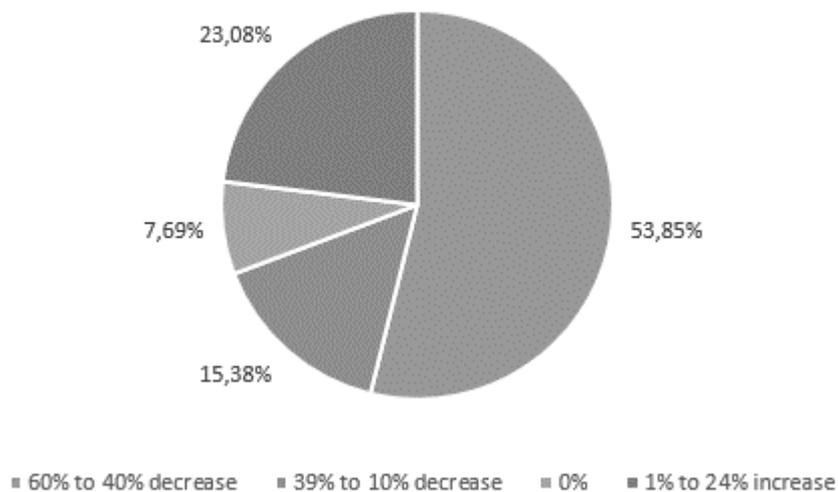
Graph 6

Change in number of guests 2022

- 39% to 10% decrease
- 1% to 24% increase
- 25% to 60% increase
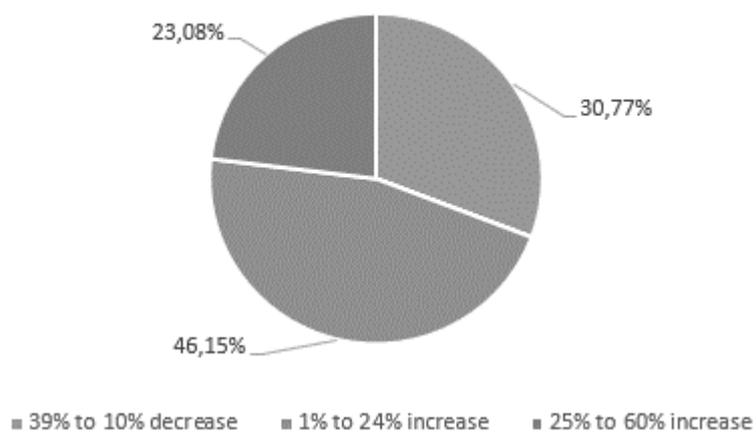
Graph 7

Change in days spend by guests 2021

- 50% to 25% decrease
- 24% to 10% decrease
- 0%
- 1% to 10% increase
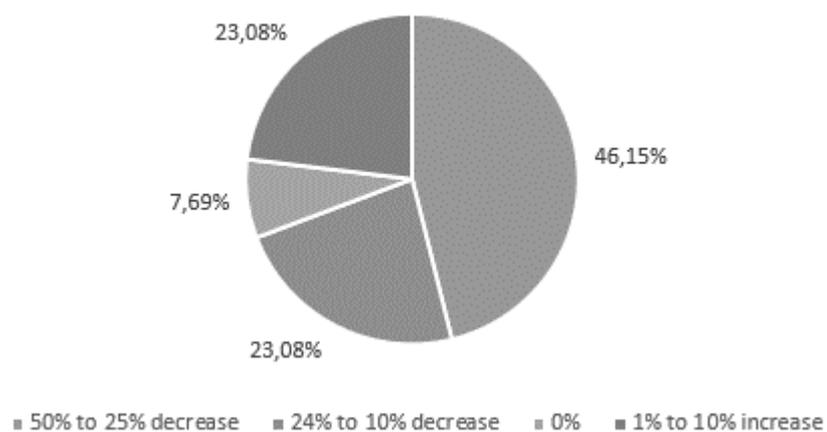
Graph 8

Change in days spend by guests 2022

- 24% to 10% decrease
- 0%
- 1% to 10% increase
- 11% to 50% increase

Graph 9

Habits 2021

Habits	Frequency
Mood	15,38%
Eating-out	23,08%
Shorter stay	15,38%
COVID-19 related	23,08%
Excursion(s)/ Transportation	38,46%
Consumption of hotel products	23,08%

Graph 10

Habits 2022

Habits	Frequency
Mood	30,77%
Eating-out	30,77%
Bigger stay	7,69%
COVID-19 related	15,38%
Excursion(s)/ Transportations outside the accommodation	38,46%
Consumption of hotel and other products	38,46%

Graph 11

Change in expenditure per stay 2021

30,77% 30,77%

38,46%

■ 50% to 30% decrease   ■ 29% to 1% decrease   ■ 1% to 19% increase
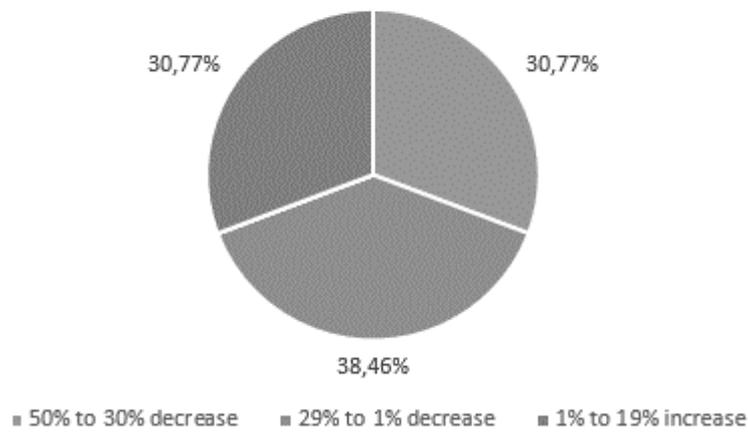
Graph 12

Change in expenditure per stay 2022

23,08% 38,46%

38,46%

■ 29% to 1% decrease   ■ 1% to 19% increase   ■ 20% to 30% increase
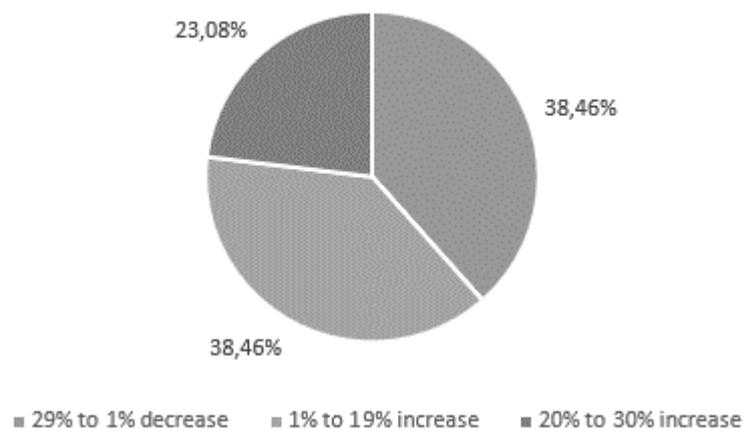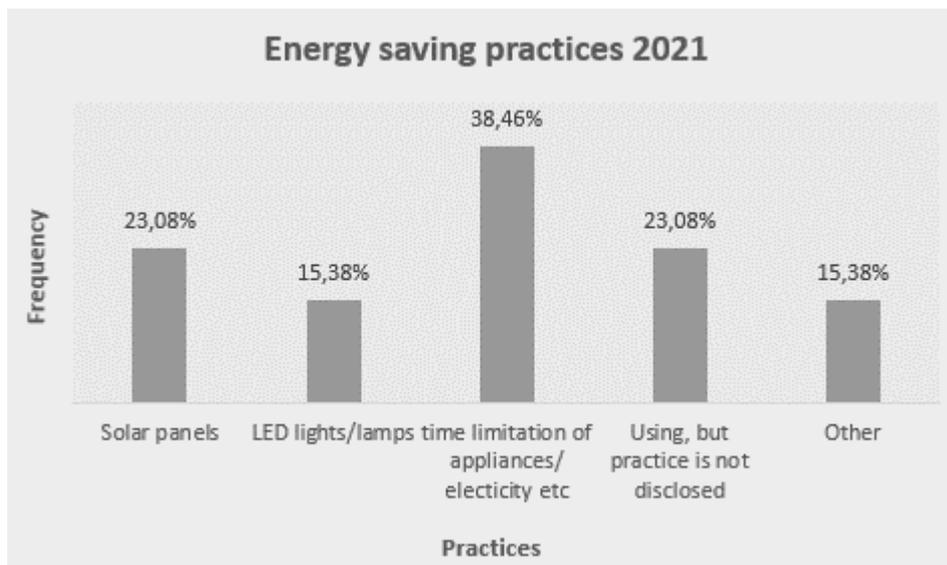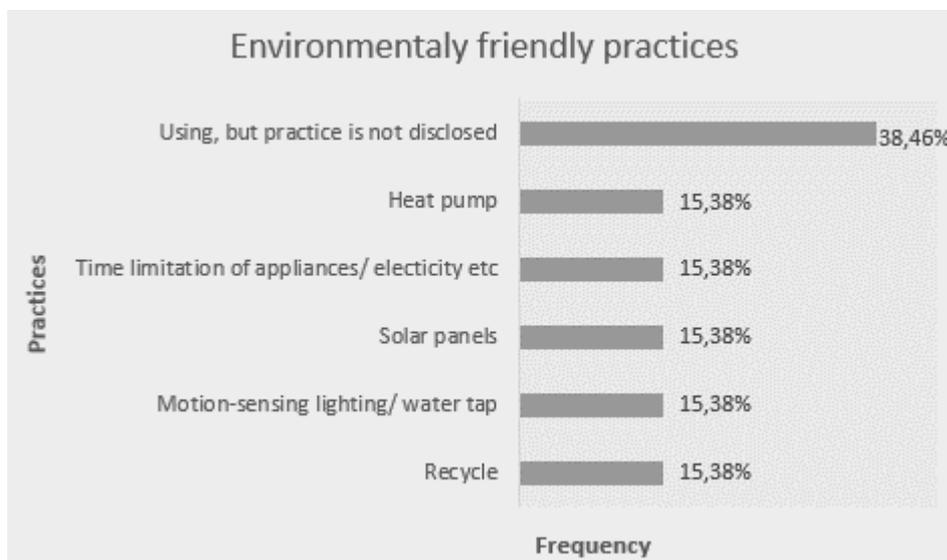
Graph 13

Graph 14

Graph 15

Tourists Descriptive Statistics Graphs

Country distribution

1,10%
1,10%
1,10%
6,04%
1,65%
2,20%
4,95%
81,87%

■ Greece ■ Cyprus ■ Italy ■ Canada ■ Spain ■ Romania ■ US ■ Other

Graph 16

Occupation distribution

Fields of occupation	Percentage
Management, Office and Administrative Support	28,02%
Unemployed	12,09%
Business, Financial and other Operations	11,54%
Educational Instruction, Library, Community and Social Service	10,44%
Healthcare Practitioners, Technical and Social Science	8,79%
Sales and Related	6,60%
Architecture and Engineering	6,04%
Computer and Mathematical	6,04%
Food Preparation and Serving Related	4,94%
Arts, Design, Entertainment, Sports, and Media	2,75%
Pensioner	2,75%

Graph 17

Sector distribution

12,09%   14,29%

73,63%

■ Public   ■ Private   ■ Unemployed

Graph 18

Number of days of summer vacation 2021

Number of days (y-axis), Number of respondents (x-axis)

- 1 to 10
- 11 to 20
- 21 to 30
- 0
- 51 to 60
- >61
- 41 to 50
- 31-40

Graph 19

Number of days of summer vacation 2022

Number of days (y-axis), Number of respondents (x-axis)

- 11 to 20
- 1 to 10
- 21 to 30
- 0
- 51 to 60
- >61
- 41 to 50
- 31-40

Graph 20

Graph 21

Graph 22

Graph 23

Graph 24

Graph 25

Graph 26

Graph 27

Graph 28
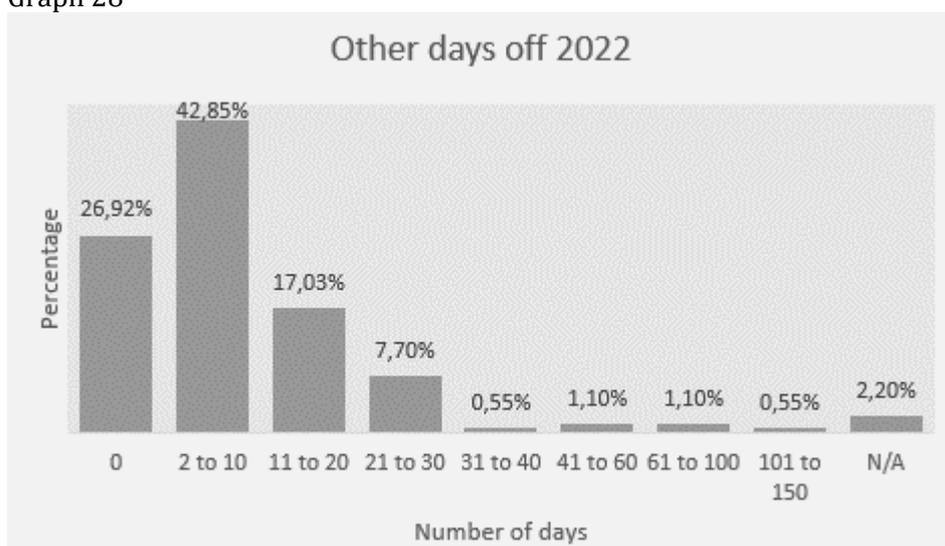
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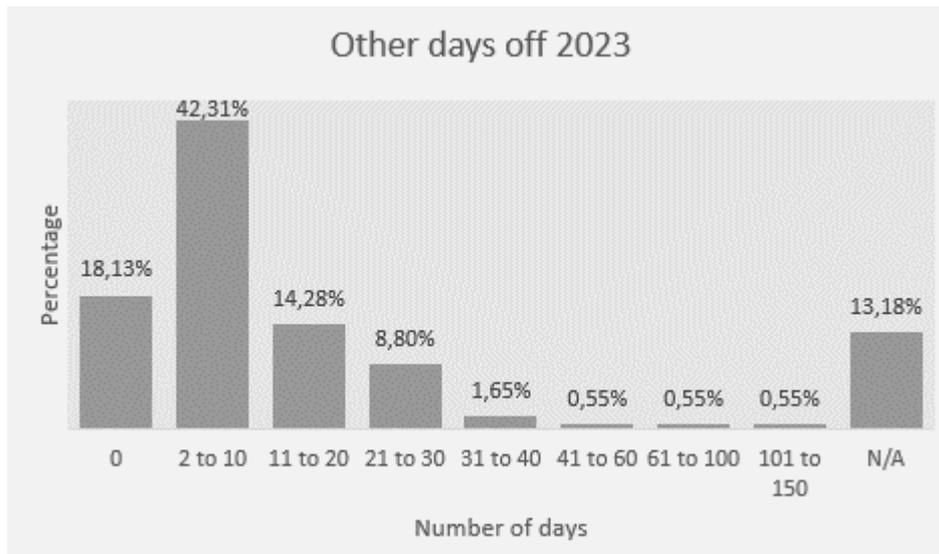
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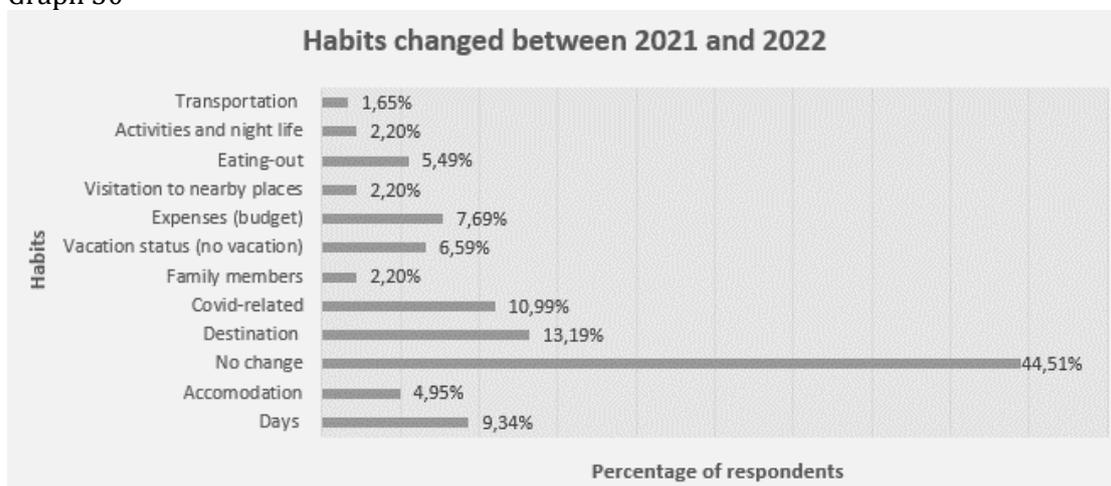
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Graph 32

Graph 33
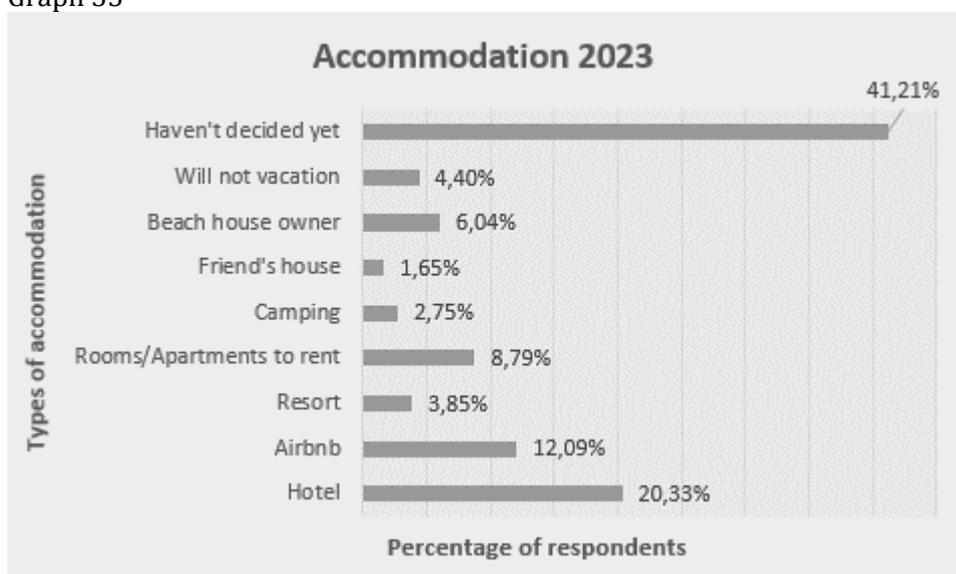
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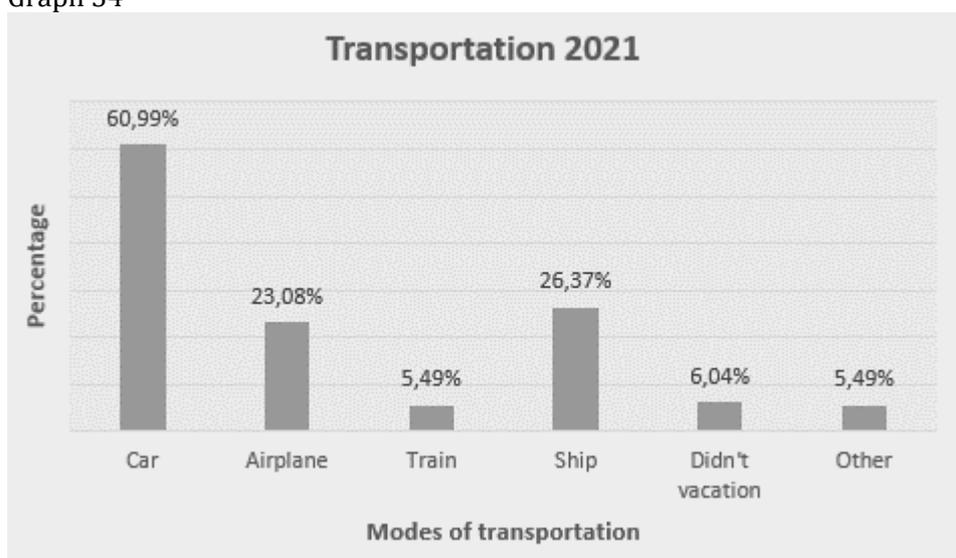

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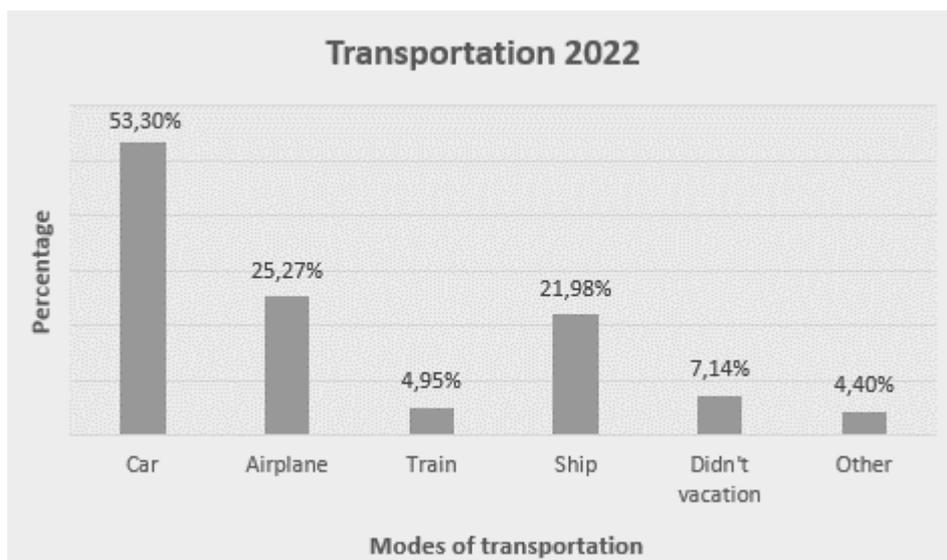
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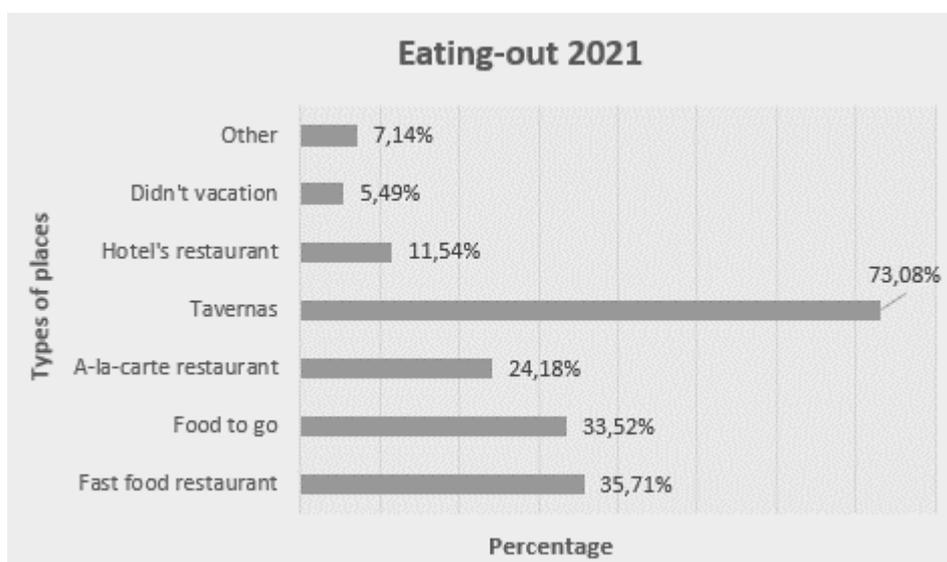
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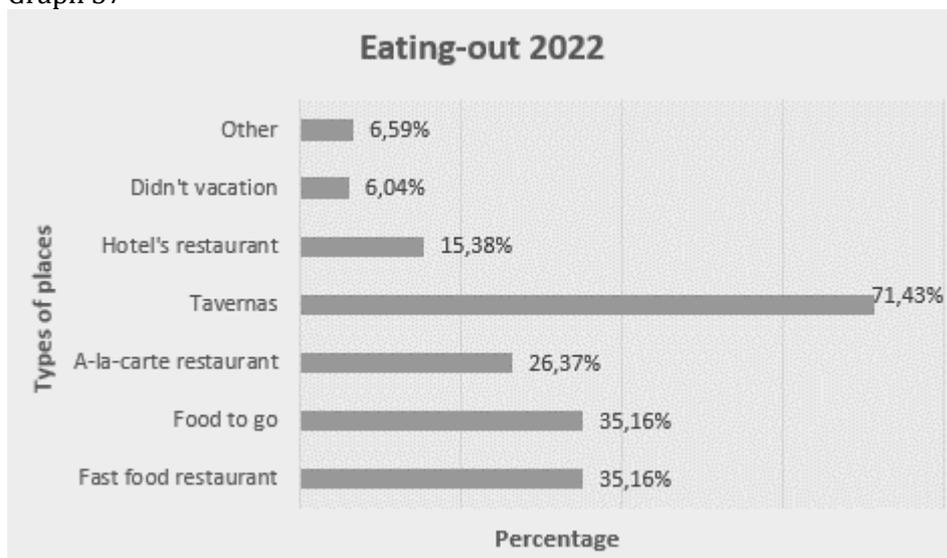
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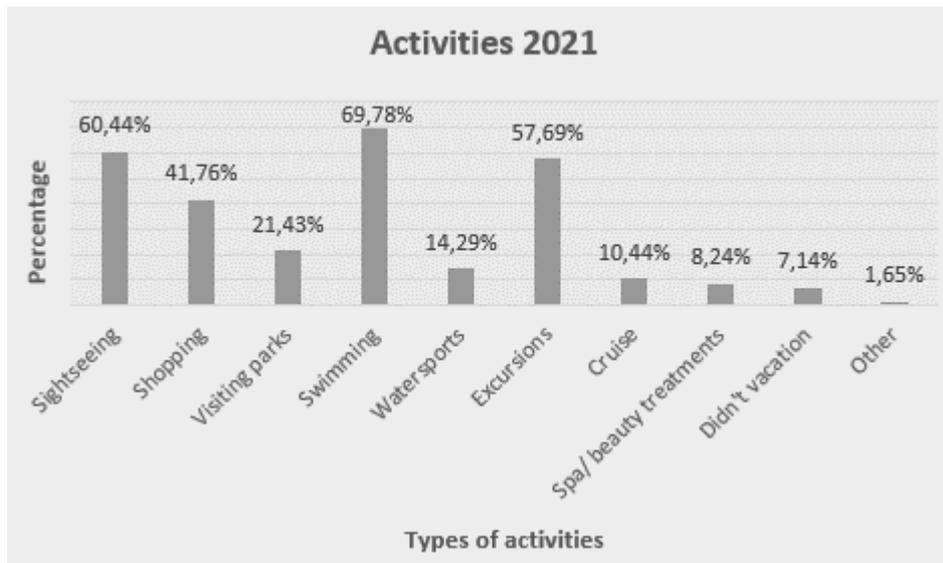
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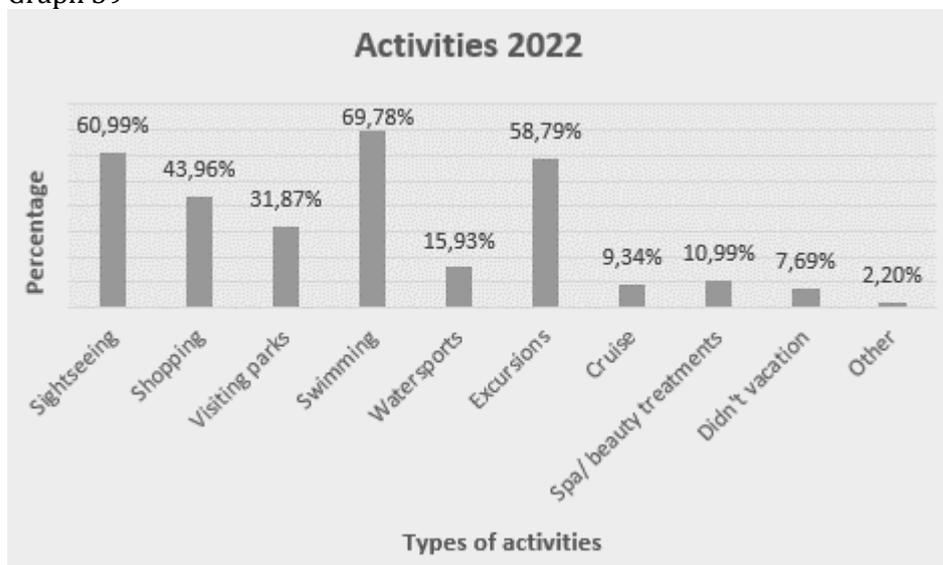

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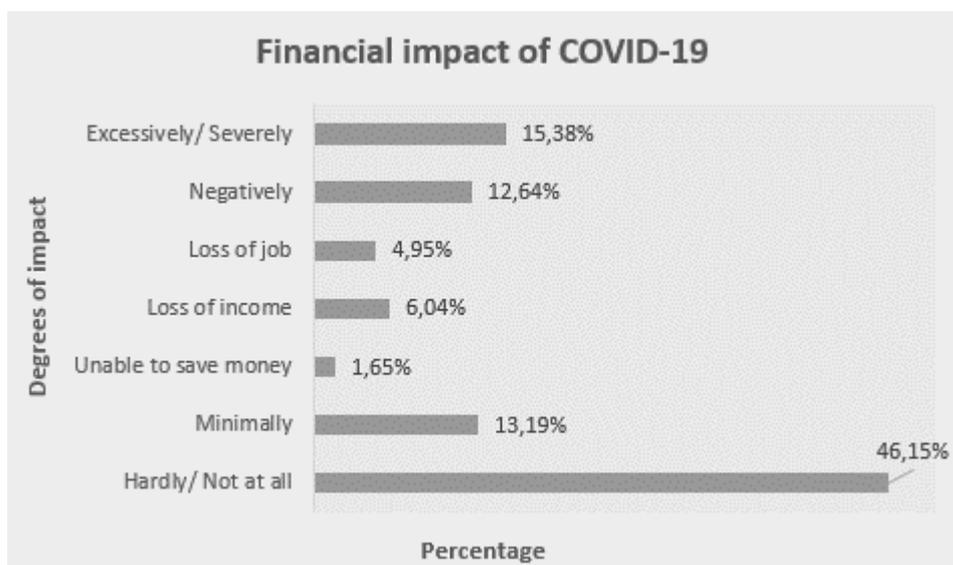
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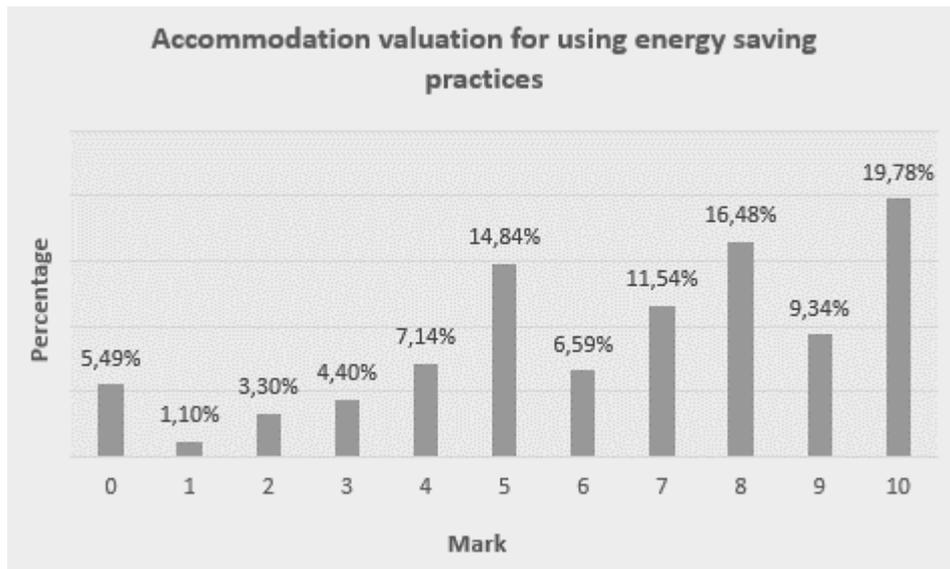
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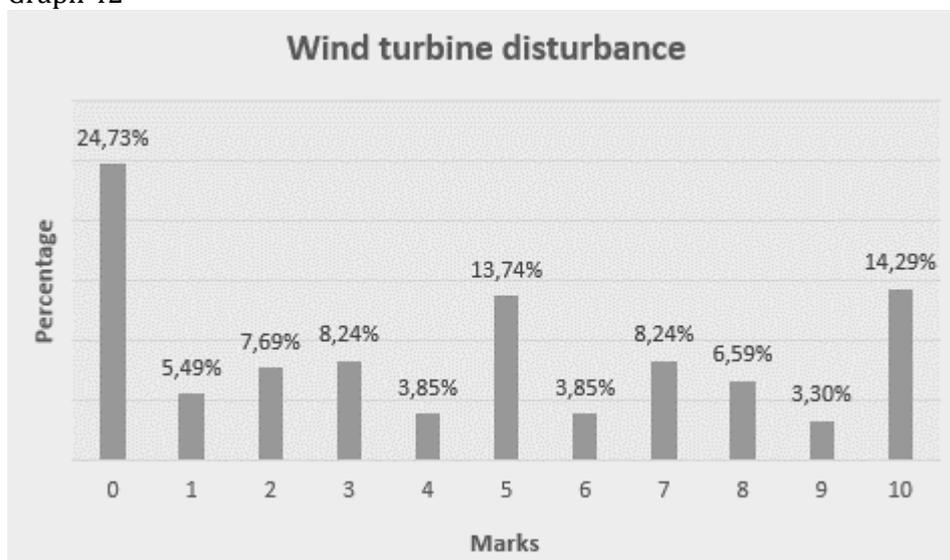
Graph 43

Appendix B

Literature Table

Study	Data	Time Span	Country/-ies of research	Variables	Methodology	Results
Surugiu and Surugiu, 2022	qualitative and cross sectional data	2004-2021	Romania	GDP, demand for tourism and other indices	risk assesment of Romanian sector	Travel patterns during economic recession change by decreasing the vacation days and the proximity to the
Congressional Budget Office, 2006	time series data	1965-2006	US	crude oil, natural gas prices	data analysis and chart constrution	The increases in energy prices have reduced the GDP and living standard of people has been reduced as well.
Usman et al, 2020	frequency and time series data	2001-2017	US	exchange rate, energy price index, restaurant and hotel prices	time-series regression analysis using the econometric model	Both energy price index and exchange rate are positively related with restaurant and hotel prices. An increase in exchange rate will reduce restaurant and hotel prices in the long-term and short-term in USA.
Ordonez-de-Haro, 2019	quantitative price data set	2013-2014	Spain	diesel prices, unleaded petrol prices	empirical analysis and tables construction	In touristic-oriented towns compared to non-touristic ones, diesel and gasoline are more expensive.
Pindyck, 1980	timeseries data (macroeconomic data)	1979-1980	US	oil price and demand (among other macroeconomic data)	framework analysis	A high inflation rate is observed due to higher prices. Oil prices increases due to the declining international value of US$.
Council of the European Union, 2022	time series data	Dec 2020 to July 2022	Europe	consumer prices for electricity, gas and other fuels, producer prices for energy in industry	data analysis and chart construction	Both consumer and producer prices have risen significantly
Petricek et al, 2020	time series data (daily performance)	2011-2018 with n=103 hotels	Prague, Czech Republic	supply for rooms, price, occupancy, quantity supplied, quantity demanded	log-log regression analysis	Hoteliers can raise their selling rates more quickly since the percentage price increases cause a significantly lower decline in demand.
Marioti, 2014	quantitative cross-sectional data	2002-2013	Sardinia, Italy	labor market in Sardinia, cost of petroleum, GDP, energy cost	data analysis with charts	The competitiveness of the business world as well as society are both negatively impacted by a sharp rise in oil costs.
Kyrylov et al, 2020	quantitative cross-sectional data	2014-2019	Ukraine	cost indices for tourism, international tourists arrivals and income	comparative analysis based on linear and polynomial models	Europe, followed by America, are the two top tourist destination continents. With high concentration comes higher risks. Last, technology helps forecast more accurate results, in relation to risks.
Loganatran et al, 2018	time-series (monthly) data	1995-2017	Malaysia	tourist arrivals, financial stability, consumer price index, global oil prices	logarithmic regression analysis	Real energy prices are crucial to the financial stability and have indirect effects on the majority of the hospitality and service industries associated to tourism.
Willenborg and Pitts, 1977	quantitative and qualitative data	1973-1975 with n=900 households	South Carolina, US	miles driven, number of automobiles, intentions to increase driving, intention to purchace large or small autos	questionnaire and analysis of these data	Inelastic demand situation had occurred on miles driven and gasoline prices.
Arbel and Horaham Ravid, 1983	time series quantitative data	summer 1979	New York State, US	percentage changes in occupancy rates	multiplicative function analysis	Energy shortages reduce hotel demand, while price increase stimulate foreign travelers as well as boost in lodging demand as a whole.
Huang and Huang, 2009	time-series data	1960-2006	US	quantities and prices of different types of goods, expenditures	regression data analysis with construction of tables	In the short-term, demand for food and energy is relatively inelastic to price fluctuations.
Arbel, 1983	time-series data	1953-1980	US	income, prices of public transportation, energy cost, prices of food and demographic variables.	function- data analysis via a multi-regression analysis	There is evidence that the rise in fuel prices had a somewhat favorable effect on restaurant sales, in the short-run. Changes in petrol costs have little long-term effect on consumer spending at restaurants.
Arbel and Ravid, 1983	time-series data	1957-1978 with n=1000 hotels and motels	US	quantity demanded, income, hotel prices,exchange dollar value, wages, food&beverage costs, occupancy rates, output, energy prices.	regression data analysis	The demand for hotel services won't decrease in response to increasing fuel prices, but rather slightly grow. Despite steadily growing energy prices in recent years, the hotel business has seen an increase in actual sales, occupancy rates, and profitability.
Becken, 2011a	qualitative and quantitative data	n= 417 businesses and n= 1.121 tourists	New Zealand	tourist demand, arrivals elasticities and supply	questionnaire and econometric analysis of these data	Oil prices increase not only limit people's capacity to travel but also drive up the cost of numerous tourism-related goods and services, such as transportation.
Canina, 2003	time-series data	1988-2000	US	gasoline prices and branded hotel rooms occupancy	regression analysis of data	In general, US hotel demand declines when gas prices rise. Certainly, the effect is not the same for every hotel as it varies due to location and hotel type.
Bjornland, 2022	time series data	2002-2022	Europe	real oil prices, demand, supply	data analysis and chart production	The energy and commodity price shocks are mostly to blame for the rise in short-term inflation in Europe, while an impeding recession is now more likely.

Author	Data type	Period/Sample	Location	Variables	Method	Findings
Carballo et al, 2017	quantitative and qualitative data	July to September 2015, n=1.212	Germany and UK	gender, age, risks, macroecoconomic factors, educational level	questionnaire and factor analysis	There are five major types of risks: health, crime, accident, environmental and disaster.
Ganapath et al, 2016	time series data	1972-1997	US	capital, labor, material, fuel prices	data analysis	Producers endure the increased incidence of changes in input costs in sectors with elastic demand.
Dan Kamp et al, 1979	qualitative and quantitative data	summer 1978 with n=92	Texas, US	miles per gallon, purpose of travel, number of traveling people, type of vehicle	data analysis with tables and charts creation	The desire to switch to small cars shows that there may be a sizable long-term elasticity impact to gasoline price increases and rationing.
Edelstein and Kilian, 2007	time series data	1970-2006	US	consumption expenditures, consumer expectations, unemployment rate	data analysis with tables and charts creation	Energy price shocks were found to have had a significant contribution to both the 1979 decrease in consumption during a period of rapidly rising energy costs and the 1986 recovery of demand following the dissolution of OPEC.
Edelstein and Kilian, 2009	time series data	1970-2006	US	consumption expenditures, consumer expectations, retail energy price	data analysis	A decline in energy prices will have relatively modest benefits on output and employment because the reallocation effect of shifting consumption habits will outweigh the gain in aggregate demand.
ACER, 2021	time series data	2017-2021	Europe	gas prices, electricity prices, gas supply	comparative analysis with charts construction	By early October 2021 gas prices saw a 400% increase compared to April of 2021, largely due to global supply and demand dynamics. Meanwhile, the price of electricity climed 200% for the same time period, primarly due to the rise in gas prices.
Upadhyay and Vadam, 2015	qualitative data	n= 40 hotel chains	Worldwide	factors influencing energy consumption in hotels	literature review and questionnaire analysis	Monitoring systems and procedures benefit energy consumption, which accounts for 60% of hotels.
Huang and Huang, 2011	time series data	1960-2006	US	consumption expenditures, price elasticities for food and energy, consumers' demand	data analysis	Good and energy price increases would result in higher compensated expenses or a significant loss in consumer welfare, which would be especially difficult for low-income households.
Kilian and Vega, 2011	time series data	1983-2008	US	macroeconomic aggregates, energy prices	regression analysis of data	Contrary to financial asset prices, oil priecs do not immediately react to domestic macroeconomic news.
Pindyck, 1999	time series data	1870-1996	US	real prices of crude oil, coal and natural gas	data analysis	According to the actual behavior of real energy prices, mean reversion to a long-run marginal cost line should be included in non-structural forecasting models.
Meng et al, 2020	quantitative data	2017	China	input- output data, total carbon emission	data analysis via the CGE model	Compared to most other economic sectors in China, the impact of the ETS (emissions trading scheme) on the tourism industry is less severe.
Oh and Hammitt, 2011	time series and qualitative data	June to December 2006, with n=209 responders	US	age, income, travel distance, satisfaction, impact on recreation, activity substitution	questionnaire and analysis of these data	Several explanatory variables gradually increased or decreased the impact of the external barrier (gas costs) on travel decisions.
Ritchie, 2004	qualitative data		Worldwide/General		literature review	Because tourism business is so vulnerable to changes and crises/disaster, it is of significance to comprehend these events, as well as to analyze them.
Atems, 2021	time series data	2000-2019	US	crude oil prices, jet fuel prices, crude oil production, jet fuel consumption	data analysis	Although crude oil is refined to create jet fuel, domestic refiners who markup crude oil prices also have an impact on jet fuel prices.
Sato and Dechezlepetre, 2015	time series data	1996-2011	Worldwide	bilateral import and export, energy prices, GDP, population	data analysis	Statistics show that changes in the relative price of energy between nations have an effect on bilateral trade.
Bosch and Graf, 2014	qualitative data	1970-1979	Worldwide	energy prices	literature review	The energy crises reveal both growing international cooperation efforts and the longevity of energy security as a political issue in national politics when seen in a broader context.
Linn et al, 2014	time series data	2001-2012	US	electricity prices, fuel consumption, fuel prices, pollution emissions	data analysis	Electrictiy prices and consumer welfare decline less in areas where pollution emissions are reduced more drastically.
Arenhart et al, 2022	quantitative data	n=45 international hotel chains	Worldwide	water use, carbon intensity, energy use	(regression) data analysis	Hotel chains can increase their revenue per available room by charging their customers for energy use.
Pablo- Romero et al, 2017	time series data	2005-2019, n=11 countries	Europe	hotel and restaurant electricity consumption, overnight stays, GDP, climate, electricity prices	data analysis	Electricity consumption in the hotel and restaurant industry and overnight stays are found to be growingly correlated.

Study	Data type	Period/Sample	Location	Variables	Method	Finding
Tabatchnaia- Tamirisa et al, 1997	time series data	1987 and 2002	Hawaii	technology, relative prices, elastic supply of unputs and demand of outputs	data analysis	About 60% of Hawaii's overall energy and fuel consumption is caused by foreign visitors.
Camilleri, 2018	qualitative data		Worldwide/General		sector analysis	Overview of tourism sector
Williams and Balaz, 2014	qualitative data		Worldwide/General		literature review	Different concepts of risks and uncertainties in tourism sector, are presented.
Ari et al, 2022	time series and cross-sectional data	2022	Europe	energy prices, consumer prices	data analysis with charts	The cost of living for European consumers will increase by roughly 7% of consumption in 2022, due to the recent spike in global fossil fuel prices.
Zhang and Zhang, 2020	qualitative data		Worldwide/General		literature review	Due to the large sums of energy consumption by tourists a successful touristic destination should co-exist with sustainable development.
Katircioglu, 2014	time series data	1960-2010	Turkey	CO_2 emissions, gross domestic product, energy use, international tourists	(regression) data analysis	Long-term equilibrium exists between energy use and tourism in terms of CO_2 emissions.
Stetic, 2012	qualitative data		Worldwide/ General		literature review	Evaluation of risks and risk preparedness in tourism sector.
Jankovec, 2022	time series and cross-sectional data	2022	Europe	air connectivity indices	analysis and comparison of data	Air connectivity, although higher than the previous two years, i.e., 2020 and 2021, is still -29% below the 2019 year.
Walsh, 2022	time series data	2022	Worldwide	aviation statistics	analysis and comparison of data	The industry losses for the year 2022 will be reduced to $9,7 billion from $137,7 billion losses in 2020.
Hu, 2022	time series data	2021-2022	China	energy prices, energy consumption	data analysis	As energy prices remain at an all-time high, its consequences for the economies, as well as consumers' , will be seen at a later stage.
Bharwani and Mathews, 2012	qualitative and cross sectional data	n=8 hotel chains	India	various risks	questionnaire and analysis of these data	It is of crucial matter that enterprises implement risk identification, analysis and assesing into their everyday life.
Glauber and Smith, 2022	time series data	1974-2021	US	prices, food groups, inflation rate, earning, CPI	data analysis and comparison	Due to COVID, the rate of food inflation has grown more than three times in 2021 compared to the previous two years.
Becken, 2008	qualitative and quantitative data	n=5500 (visitors)	New Zealand	country, length of stay, travel sectors, distance, energy (in MJ)	survey data analysis	Every year, the demand for oil rises to meet tourism needs. Regarding the amount of oil used by visitors in New Zealand, these demands range.
Becken, 2011b	qualitative and time series data	1970-2008	Worldwide	oil price, GDP, travel expenditure	Macro and Microeconomic analysis using literature review	Tourism activity as well as societal activity will be severely impacted by the availability of oil and its high prices.
Miljak et al., 2022	qualitative and quantitative data	n=43 (restaurants)	Croatia	type of business, region, number of employees, price inflation, revenue, income	survey questionnaire analysis	In the summer of 2022, Croatian restaurants plan to raise their pricing for food and drink items.
Brunson and Shelby, 1993	qualitative data		Worldwide/General	recreation substitutability	literature review	There are still problems with recreational substitutability, like as figuring out what constitutes a "acceptable equivalence," the difference between planned and actual substitutes, etc.
Gros and Shamsfakhr, 2022a	time series data	2004-2021	Euro area, US	oil prices, energy prices, inflation, gas price, fuel price, electricity price	data analysis (producing graphs and charts)	While there are regional variations in Europe, the energy price rise in the euro area is more consistent than in the US.
Heymann and Becker, 2022	time series data	2012-2021	Germany	food prices, energy prices, CPI	data analysis (producing charts)	In Germany's CPI, the energy price index grew by an average of 10,4% in 2021.
Owayni, 2022	time series data	June 2021- June 2022	US	foot traffic data	data analysis	In the US, significant reductions in dining out, coffee runs, unnecessary purchases, and new clothing have been noted for 2022.
Gros and Shamsfakhr, 2022b	time series data	2004-2022	Europe	core inflation, CPI, energy price, headline inflation	data analysis (producing graphs)	Gas price today is highly influential in Europe, in contrast to the USA, thus pressuring the EU countries and economies even further.
Korhonen and Ledyaeva, 2010	time series data	1994-2005	Worldwide	GDP growth rate, oil price	data analysis	A spike in oil prices has a favorable immediate impact on a nation that produces oil, like Russia.
Lee and Jang, 2007	time series data	1997-2002	US	stock price, NYSE index	regression analysis of data	Systematic risk in the aviation business is significantly influenced by elements including debt leverage, profitability, firm size, growth, and safety.
Munoz et al., 2022	time series data	2018-2022	Euro area	consumer inflation, oil prices, natural gas prices	data analysis	Since that the spike in gas prices is unparalleled in history and is therefore assumed to be permanent, this could have negative long-term repercussions on economies.
Morgan, 1986	time series data	1969-1982	US	park visitations, income, time, transportation prices	data analysis	All US parks are affected by the energy crisis, but the Grand Canyon is more severely affected due to its greater distance.
Sheel, 2008	qualitative and time series data	1980-2008	US	GDP, unemployment rate, tourism revenue, room availability	literature review	Hotel room occupancy rates are anticipated to be considerably lower in 2008 than in 2007. In 2008, a significant number of restaurants declared bankruptcy.
Yeoman et al., 2007	qualitative and time series data	1970-2007	Scottland, UK	oil prices, inflation rate	literature review	Risk reduction for alternative energy sources is required because of the high price of oil and to protect the economies.

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