What are the factors that influence the level of tourism development?
Research based on 130 countries

Dorian Ardeleanu
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Abstract

This study is based on data regarding the social, economic, and demographic characteristics of 130 countries, and uses fixed effects estimation for the model analysis. It demonstrates that tourism development represents a complex process that requires the implication of a multitude of stakeholders. Macroeconomic factors, such as GDP per capita growth and economic openness, are having a positive impact because they benefit private ownership and motivate people to open tourism-related businesses. Overall, higher CO₂ emissions and worse safety are having a negative effect over tourism development. Human development factors, such as education, are generally beneficial to the long-term tourism growth because they serve as positive externalities. Clustering the initial dataset based on various economic, demographic and social factors brought several new conclusions. Particularly, GDP per capita growth is not an important tourism development factor among developed countries, whereas the dummy variable for the year 2010 is a substantial one. Education and economic freedom are particularly important regressors for post-socialist states. The former is also crucial among African countries and in the Latin American region, where safety has also an essential impact over tourism development. Finally, tourism in small states would benefit the most from lower emissions, whereas in big states the best strategy for the policymaker would be to increase safety measures.
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1 Introduction

During the last decades, the tourism sector has been constantly evolving and expanding. As a result, it has become an important part of the economies of many countries, creating many jobs and contributing substantially to the states’ gross domestic product. The significance of tourism is therefore doubtless. Developing this industry would bring a series of positive externalities, leading to a virtuous circle, in which more visitors contribute to the economic development of a region, and a more advanced economy is expected to bring a higher number of tourists through different indirect channels. Thus, it is particularly interesting to find out what is the influence of different macroeconomic, social, demographic, and infrastructural factors over the level of tourism development because it can give useful insights to the policymakers. The purpose of this paper is to analyze the effect that some factors have over the growth of tourism. More concretely, it investigates the impact of the economic development, of the level of emissions, economic freedom, education, and intentional homicides. Initially, one would expect the economic growth to have a positive impact over tourism development since these two factors tend to be mutually beneficial for each other. The effect of the emissions could be ambiguous because, on one hand, higher emissions are worsening the ecological situation which is demotivating tourists to visit the country. On the other hand, higher emissions are strongly related to more flights and more cars used by travellers themselves. Economic freedom is clearly expected to influence tourism growth in a positive way because more open economies tend to benefit more from capital and labour mobility, and they have a more developed transport and logistic infrastructure. The latter is also more evolved in countries with better education - this is why more years of schooling are expected to indirectly influence tourism growth in a positive way. Last, the number of intentional homicides is a strong indicator of safety issues, which are extremely unattractive for the majority of tourists.

The study is based on a panel data that includes information regarding 130 countries over a time period of 20 years, between 1995 and 2015. A big amount of cross-sectional data is necessary in order to give universally applicable results, whereas a long time-series helps to see the evolution of the outcomes over time. The results are obtained using a method called
fixed effects estimation. This model controls for the omitted variable bias that appears when the unobserved heterogeneity is constant over different time periods.

In the Literature Review chapter, studies with a similar topic of investigation are discussed. Particular focus is made on the research that included the same or similar independent variables in order to see the differences and the analogies between papers. The next chapter is dedicated to theory that is not directly related to this paper’s study topic, but is useful in explaining the results. It includes a discussion of the relationship between tourism and crime levels, the effect of education on businesses, Human Capital Theory, the effect of economic freedom over the country’s economic development, and the effect of the 2008-09 crisis. Chapter 4 represents an overview over the data collection methods, including the sources used and the independent variables included. Besides that, the correlation between regressors is discussed, as well as its potential effect over the results. The following chapter presents the statistical methods used to process the collected dataset, and particularly the fixed effects estimation. Afterwards, all the multiple linear assumptions are tested in order to make sure that the estimated values are correct and unbiased. The next chapter represents the results of the regressions described above. First, the overall effect of the considered independent variables over the tourism growth is calculated and discussed. Afterwards, the dataset is divided into six, sometimes overlapping groups. The outcomes are then compared and the reasons behind different results are considered as well. The last chapter concludes the previously discussed matters.
2 Literature Review

This section will discuss other studies that have a similar or tangential topic to the question of our interest: the factors that are affecting the number of international visitors in a country.

The purpose of the study performed by Assaf and Josiassen [2012] was to determine the most important factors that influence the level of tourism development, as well as to rank them based on their relative contribution. After a thorough literature review and after asking the industry specialists, the authors came up with eight distinct drivers of tourism capacity: industry-related infrastructure; economic development; health, safety and security; price levels of tourism; government policy; sustainability of the environment; labour; the natural and cultural resources. The touristic performance of each country was estimated using the Data Envelopment Analysis (DEA) methodology. The subsequent effect of the vector of independent variables on the explained variable was estimated using the Truncated Regression Model. The results of the study revealed the importance of various determinants, among which the environmental performance, the level of corruption, and the education index. One of the potential problems that the above-discussed research could have is the multicollinearity, which represents the situation when there is a high correlation between two or more independent variables. In our case, the authors included both the GDP per capita and the unemployment rate as explanatory variables. According to the Okun’s law, a 1% decrease in unemployment would lead to a 2% increase in the GDP [Prachowny, 1993]. Since the population number is rather stable in the short run, we can claim that there is a direct inverse relationship between the unemployment rate and the GDP per capita as well. Therefore, additional attention should be paid to the choice of the vector elements in order to avoid the above-described issue.

Wilson et al. [2001] narrowed the topic of the previous research, aiming to find the factors that contribute favourably to tourism development in rural areas, and using a focus group methodology in order to find that. Clearly, the research has been done at a more regional level, that is why the features that affect tourism are more local and community-related. The most important factors are: a complete tourism package, great community leadership, local municipality involvement, enough financial resources for tourism devel-
opment, and strategic planning. Unfortunately, not all these factors can be used in more quantitative studies since it is rather complicated to represent them in a numerical format. For instance, community leadership seems to be a valuable but quite subjective feature, which makes its quantification unattainable.

In their paper, Joshi et al. [2017] studied the factors that have a substantial effect over tourism growth: predominantly - the natural, cultural, and the sociopolitical aspects. The research was based on cross-sectional data that covered 131 countries across the globe, and represented a log-linear regression, in which the dependent variable (the number of tourists that visited the country), was put in logarithm in order to indicate the growth. The results demonstrated that the "policy" variable has the strongest and the most statistically significant effect. In this case, the policy variable is based on the estimation of WEF pillars 1 and 5. These pillars are strongly related to tourism regulations and they show what is the level of tourism prioritization that the government of this country has. It is followed by the natural resources, health and hygiene, cultural resources, infrastructure of transports, human resources, and price competitiveness. Surprisingly, other presumably important characteristics, such as environmental sustainability or tourism infrastructure, proved to be statistically insignificant. This could happen due to a potentially high correlation between variables, as well as because of the way these indicators were constructed.

The study performed by Lordkipanidze et al. [2005] demonstrates the importance of entrepreneurship as a "central force" influencing the GDP growth because of the ability of businesses to stimulate innovation and improvements. This is particularly true in the tourism industry, where constant changes are required in order to keep up with a higher demand. The paper mentions that sustainable tourism entrepreneurship is useful in developing various rural areas and in transforming them into popular destinations. Consequently, it can serve as a catalyst that uses the existing resources and contributes to the overall regional development, with tourism as the primary tool for that.

Yang and Fik [2014] studied two different types of spatial effects in the growth of regional tourism: spatial heterogeneity and spatial spill-over. The research has been based on data regarding 342 Chinese cities between the years 2002 and 2010. The dependent variable studied was the variability
in the growth of tourism among these places and during the given period of time. The authors found that the infrastructure of hotels, the economic growth, localization economies, and the funding for tourism resources have a big effect over the previously-mentioned variability. Besides that, spatial spill-over effects and the competition between the urban areas is also important in determining spatial heterogeneity.

The purpose of the research performed by Ozturk [2016] was to identify various factors that had impact over tourism development in 34 countries, over the years 2005 - 2013. The study has discovered that government spending, and particularly expenditures on health, represents one of the most influential components, the effect of more spending on health being positively associated with tourism indicators. However, ecology-related factors, such as air pollution and energy consumption, play a substantial negative role. Finally, economic growth was proven to have a statistically significant effect over the development of tourism as well. From the statistical perspective, the regression has been executed using fully modified ordinary least squares and using dynamic least squares. Particularly surprising is the fact that, even if energy consumption has a negative effect over tourism development, carbon dioxide emissions were found to be positively associated with tourism indicators. Such a finding is counter-intuitive because CO₂ emissions are a part of the overall energy consumption. The explanation to this paradox might be the following: carbon dioxide emissions are directly correlated to transport, which is a necessary requirement for visitors. At the same time, the overall energy consumption is broader, being also related to various heavy industries, which have a detrimental effect over the environment but are not directly contributing to tourism growth.

Pulido-Fernández et al. [2019] investigated the relationship between environmental sustainability and tourism growth, finding that these two factors are mutually influencing one another. Thus, more tourists visiting a destination can lead to a worse ecological situation. At the same time, there is a positive effect of more environmentally sustainable practices over the number of visitors. The authors therefore demonstrate that the structural transformation towards more sustainability does not only have ecological benefits, but is also propitious for the economic performance, including through the growth of tourism.

More specifically, Snieška et al. [2014] studied the elements that have
a substantial effect over the development of tourism in rural areas, with focus on the case of Lithuania. This area, according to the authors, has a great potential to grow that is currently not used to its full capacity. It has been found that the economic factors have the biggest effect over the level of tourism development in this region. These are: the overall economic development expressed through the GDP, government expenditures and its revenue, salaries, as well as investments made by foreigners.

Haxton [2015] describes various policies that can beneficial effect over the growth of tourism, and how they are connected between each other. That is, the paper emphasizes the importance of green growth because of the environmental imbalances brought by the classical economic theory approaches. Ideally, it should be related to the inclusive growth, which supports a substantial increase of economic, social, and environmental living standards for a large part of the population. The paper supports a more holistic approach to growth because it can help find a perfectly balanced solution, in which the economic growth is mutually supported by a decreasing income inequality. The authors suggest that tourism-related policies should not be designed apart, but rather in a strong connection to other government decisions in order to avoid over-regulation and inefficient work.

According to Thomas and Long [1999], competitiveness represents one of the prerequisites for tourism development. That is, small and medium businesses need to be persuaded about the necessity of competition, and that they need to be proactive rather than reactive in order to achieve growth. However, the authors point out that many businesses in the tourism industry are satisfied with their current state of being and do not express the wish to economic growth. In my vision though, albeit this such an attitude might initially seem ideal from both social and economic perspectives, it makes the SMEs more vulnerable to the activities of big players. It could potentially lead to the bankruptcy of the latter and to the subsequent monopolization of the market.

Garrigós-Simón et al. [2015] claims that calculating sustainability as a quantitative indicator is a rather complicated task because of its complexity and relative subjectivity. Thus, this article presents a mathematical model designed to measure economic sustainability in the field of tourism through the leakage in the hotel industry. In this context, leakage means the amount of money that is made thanks to tourists but which does not stay in the
country. The authors point out that sustainable economic growth requires policies that are suitable for a big variety of stakeholders. Besides that, the interests of all collaborators need to be taken into account. Indeed, a multidimensional balance of motivators is often a more important tool to achieve sustainability than, for instance, quick economic growth.

The paper published by Bianchi [2018] shows the link between various points of view in the political economy and tourism development. It discusses the contrast between the modernization theory and neo-Marxist tourism critiques. The former claims that developing countries should be open to tourism and to foreign capital investment because these are drivers of the economic growth. The latter argues that the development of tourism in "Third world" countries would lead to even higher income inequalities between states. The purpose of our research, though, is not to advocate any of these theories, but rather to present the ambiguity of ideas. Therefore, it is important to keep in mind that the effect of various factors on the level of tourism development does not only depend on objective and quantifiable characteristics, but is also influenced substantially by the current government policy.

The support of the local community for tourism is another factor that has potentially huge influence over its development. The study performed by Woo et al. [2015], based on answers from residents of five distinct destinations, found that the locals perceive tourism as a way of improving "material and non-material" life satisfaction, thus being a catalyst that enhances people's well-being in many ways. Moreover, authors claim, the better quality of life leads to an even more developed tourism industry. Therefore, if the local residents have initially a positive attitude towards national and international visitors, if they are willing to share their culture, monuments, and experience with others, then it would lead to a virtuous circle, in which each element supports the further development of the other.

In their paper, Ghosh [2019] investigates the impact of the economic and political uncertainties over tourism. The economic unpredictability has been estimated using the Economic Policy Index, whereas the terrorism index has been used as a proxy for the political unpredictability. In my vision, the usage of the latter as a political indicator seems to be a rather superficial approach because of the complexity and distinctiveness of various political regimes. The study, which is based on a time period between 1995 and
2016, found that uncertainty has a negative effect over the level of tourism development. However, the fact that the study was based only on three countries: France, United States, and Greece, suggests the non-applicability of the results on other countries, especially on the ones that have a lower GDP and/or fewer tourists.

Regardless of substantial differences in the approaches that each of the above-discussed studies have, some of the factors that have substantial effect over tourism growth have been encountered more regularly. Infrastructure is the factor that many studies consider crucial in determining the subsequent development of tourism - both at the national and at the local level. Economic factors are also important at both macro- and at micro- levels. For instance, researchers found that government purchases and business activity serve as driving factor for tourism growth. Some studies reveal that the state can influence our variable of interest not only through increasing investments, but also through decreasing the taxes, thus motivating entrepreneurship in the field. Some qualitative factors, such as sociopolitical and cultural aspects, as well as the local community involvement, were found to be significant as well.
3 Theory

The purpose of this chapter is to describe the theory that serves as explanation to the subsequently constructed model and regression. In comparison to the Literature Review (section 2), the ideas described in this chapter do not have to be directly related to the question of our interest, but are supporting the explanations behind the outcomes. Some of the discussed theories are concerning particular relationships between some of the independent variables, which might be an important issue in the context of multicollinearity. First, a previous study about the correlation between tourism and crime is presented. Then, the paper discusses the direct positive relationship between education and human capital development, as well as between greenhouse gas emissions and tourism. Human Capital Theory furthermore explains the benefits of higher education as a driving force for the social and economic development. Besides that, this chapter emphasizes the importance of economic freedom and describes various ways for its estimation. The theory behind the negative effects of the 2008-09 economic crisis is discussed in order to explain the introduction of the dummy variable for the year 2010. Lastly, the law of diminishing returns is extremely useful when discussing the heterogeneity between countries.

According to Ryan [1993], the relationship between crime and tourism exists, and it can be identified in various forms. The first one is when tourists are indirect victims and the main focus of the criminal activity is on the indigenous population, the destination having no relationship to the illegal activity. The second form is when the tourist location is popular among law-breakers because of its nature (higher density of population, higher GDP per capita, more businesses), but their activity is not oriented towards tourists. However, criminal activity can be specifically organized against tourists because of their relative defencelessness due to linguistic, social, or cultural barriers.

Education, one of the factors included in the empirical model, comes in a strong positive relationship with the human capital, which is one of the most important indicators of the country’s multilateral development. From the entrepreneurship perspective, it represents a resource that increases the probability that the business will survive in the long term thanks to better skills and experience that the owner has [Brüderl et al. 1992].
Human Capital Theory puts special emphasis on the higher education because it is double beneficial - both for the people and for the government [Schultz 1961]. For every individual, more education will lead to higher lifetime incomes albeit they start working later due to the studies. It also brings higher labour flexibility and less time spent while being unemployed. Besides that, higher levels of education also improve the productivity of factories and businesses. From the governmental perspective, higher education leads to a more stable society with generally healthier citizens, which is very beneficial for the state budget. In consequence, the government can decide to spend the budget surplus on other areas, such as infrastructure, research and development, sovereign wealth funds, or also on education. Ideally, it leads to a virtuous circle, in which more education not only means overall long-term evolution, but also more education.

The concept of economic freedom, which is one of the factors studied, represents one of the most important elements of the country’s economic development. In order to estimate it in a complex way, a combination of both objective and subjective constituents is required [Gwartney and Lawson 2003]. Its most important elements are: free competition among businesses, liberalized exchange, personal choice, and property and personal protection. Under perfect economic freedom, nothing and nobody decides for the stakeholders regarding their entrepreneurial activities except for themselves, therefore the personal ownership of goods and intellectual property is particularly important. However, the author recognizes that the index is too multiplex and depends on too many factors, thus it cannot be measured with ideal precision.

It is rather logical that the 2008-2009 economic crisis had a substantial negative effect over the number of tourists due to the fact that people tend to keep their savings for more crucial things, such as food and housing. According to [Papatheodorou et al. 2010], some travellers definitely decided to reduce their spending on visiting various destinations, but only in short to medium term, whereas the long-run effect should be much more moderate. Thus, the numbers were negative during only a year and a half, whereas the year 2010 is already considered to have brought recovery. The authors consider that regional cooperation and collaboration are among the most important tools that contributed to the convalescence of the tourism sector, consequently bringing a more sustainable growth and greener ways of trav-
elling. Such a conclusion seems to be valuable also in the context of the post Corona crisis rehabilitation.

Both various studies and empirical outcomes reveal that there is a direct positive relationship between tourism and greenhouse gas emissions [Gössling, 2013]. The influence of tourism over the national emissions seems to be statistically significant in all countries studied, but its intensity differs. Moreover, the study reveals that the effect can be underestimated because of the inconsistency of the calculation methods used, and in reality it is higher than the ”official” 5-15%. According to the authors, tourism is a very energy-intense economic sector that is expanding rapidly, but the policymakers are not making the necessary decisions in order to redress its negative outcomes. According to a study based on selected Asia-Pacific states, for instance, more visitors will lead to higher levels of carbon dioxide emission in the long run [Shakouri et al., 2017]. The results are, however, similar in a study that investigates most visited states, as Koçak et al. [2020] concluded in their paper.

The law of diminishing returns is useful in this study because it explains why some effects are stronger for particular sets of countries, whereas for other states they are much less relevant. According to Shephard and Färe [1974], if one applies continuously the same amount of effort, labour, or capital, on a certain activity, then the output of each additional contribution will be lower and lower. For instance, if a developing country will invest \(x\) million euros in education, then this action will have a more observable effect over its overall development then if a more developed country will invest the same amount of money. This happens because of a higher productivity of each item at the initial levels of production. Afterwards, once there are more items playing the same role, then the influence of each additional one will be less observable.
4 Methodology

The purpose of this section is to describe the methods of finding the data that has been subsequently processed, as well as the sources used. Since the question of our interest is rather macroeconomic, it does not imply the direct usage of surveys and interviews in the process of data collection by the author of this paper. All the figures have been collected directly from reliable databases. It is possible, however, that surveys and other types of qualitative data collection have been used in the process of creating the above-mentioned databases, which means that, indirectly, they might be used in this study as well.

The nature of the socioeconomic processes and of the influences between them is dynamic, and can hardly be analyzed at one certain point in time. Therefore, this paper deals with panel data that cover a time period of 20 years, between 1995 and 2015, and which is divided into five periods with a five-year time span between each of them. Unfortunately, more recent information regarding some independent variables is not fully available because some organizations require up to several years to collect and publish the data.

Also, the five-year gap between distinct time periods was chosen because of its higher availability. Say, there is more data regarding the year 2005 than regarding 2003 because some countries and organizations tend to summarize their results exactly with a five-year interval. Besides that, including every year in the analysis would have implied a much lower variability because, obviously, indicators do not change much from one year to another, whereas five-year alterations are more observable. The variables included in the regression are the following:

1. The growth of tourism represents the dependent variable of our interest. The information has been extracted from the UNWTO database [UNWTO, 2021], and represents the number of international arrivals in a certain year. The number of international arrivals was chosen instead of a combination of the number of international and domestic tourists because of the lack of data regarding the latter. That is, the number of domestic tourists is very often presented by the local tourist organization instead of being estimated by UNWTO. Thus, substantially more information is available regarding developed states, whereas there is
little to no data regarding the number of domestic tourists in the countries that are less economically developed. Thus, using a combination of international and local arrivals would have led to the exclusion of a lot of developing states from the dataset because of the lack of data regarding them. Subsequently, it would have made the study focused too much on countries with a higher GDP per capita, which would have decreased the universal applicability of the results because of a strong selection bias [Heckman 1990].

2. The first independent variable is the country’s level of economic growth. It is represented by the real GDP per capita growth, and is extracted from the database provided by the World Bank [WB 2021b]. The currency used is constant over the whole period studied in order to avoid inflation effects. It is calculated with the value of the US dollar in 2010. It is generally expected that the level of economic development and the number of tourists are mutually affecting each other. Including this variable could lead to the problem of endogeneity due to the simultaneity [Wintoki et al. 2012]. Therefore, this variable has been included with a time lag. In this way, only the lagged independent variable would influence the dependent variable of tourism growth, and not vice versa.

Figure 1 demonstrates that, at any point in time, there is a positive relationship between the GDP per capita and the number of tourists. It implies that these two factors are mutually influencing each other and gives empirical explanation to the usage the independent variable with a lag.
3. Another important factor that could potentially influence the level of tourism is related to the environmental sustainability. The CO2 emissions (metric tons per capita) were used as a proxy for it, with the information being extracted from the World Bank database [WB, 2021a]. According to Shahbaz and Sinha [2019], there is a nonlinear relationship between the economic growth and CO2 emissions, having an inverted U shape. This non-linearity implies the necessity to include this variable in the form: $x + x^2$.

4. One could expect that the overall economic freedom would give
more incentives for businesses and would provide a healthy competition in the country. There is a positive relationship between the supply of services in the tourism industry and the demand for them, therefore a positive effect of the economic freedom over the level of tourism in the country is expected as well. In other words, the index of economic freedom has been chosen due to the fact that more economic freedom gives more incentives for the people to have economic activities. The supply usually balances the demand, therefore we would expect more tourists demanding these services as well. The information is downloaded from the Index of Economic Freedom database [Heritage Foundation, 2021].

5. Safety represents one of the most important factors that is supposed to influence people’s decision regarding visiting a certain country. The level of intentional homicides per 100,000 inhabitants has been used as a proxy for safety as there is obviously a strong direct inverse relationship between these two factors. This indicator has been chosen because of its overall high availability both among developed and among developing countries. The information is provided by the World Bank [WB, 2021c].

6. One could expect that a higher level of education would have a positive effect over a series of indicators which are harder to quantify but which could have a strong influence over the number of tourists. This could be the development of the human capital, the infrastructure expansion, or the people’s awareness and attitude towards sustainability and towards new cultures. Thus, education serves as a cumulative proxy to all the above-mentioned semi-qualitative indicators. The average years of schooling per person will be used because of its higher availability [Our World in Data, 2021]. Due to the fact that developed countries have initially higher levels of education than developing states, it was decided to include the growth of education instead.

7. Year dummy variables are generally a useful way of taking into account structural changes in the economies, as well as temporary variations [Green and Doll, 1974 p.60]. It can be supposed that the 2008-2009 crisis has severely influenced people’s incentives to travel during the
next several years, and therefore a **dummy variable for the year 2010** has been included as well.

Overall, information regarding 130 countries has been collected. A higher number of observations is necessary in order to ensure that the distribution is standard and normal, according to the Central Limit Theorem [Wooldridge, 2010, p.845]. Besides that, having data regarding more countries is necessary while dividing them according to regional or socio-cultural indicators.

Some values in the created panel data were missing due to the fact that not all countries and statistical offices provide with data regarding each country for the years of our interest. In order to solve this issue, data imputation methods were applied [Efron, 1994]. If an observation was not available for the year $n$, but was available for one of the years $n-1$ or $n+1$, then that one was used instead. If the observation was available for both years $n-1$ and $n+1$, then their average was calculated. Such an approach does not have a big influence over the variability of independent variables and over their overall effect. For instance, one would likely expect the index of economic freedom to be rather stable over a short time span, and that the observations for three consecutive years are somewhat similar. Thanks to the fact that the vast part of data was available, imputation was necessary only for 14 countries, which represents 10.76% of the total number of states. Overall, 39 numbers were calculated using imputation (in the case of some countries, finding missing data using imputation has been used more than once - either for different regressors or for different time periods), which is 1% of the overall amount of data. It means that data imputation has a very minor effect over the final results.

It is important to mention that the nature of macroeconomic data implies a rather strong relationship between various factors. No variable can be viewed individually, the context being always of crucial importance because the vast majority of them are interconnected - either through policies [Mügge, 2016], or through people’s reactions to them. Therefore, the following correlation matrix, which demonstrates a strong positive relationship between almost all variables, is expected:
Figure 2: Correlation Matrix
5 Data Processing

The purpose of this section is to describe the overall process of data analysis, including the choice of the empirical model and of the estimation method. Besides that, particular attention is dedicated to testing various multiple linear assumptions and to solving them in the case of potential issues.

The main point of interest of this paper is the following: how do different factors affect the growth of tourism in the country. Therefore, the equation behind the main model has the following form:

$$\ln(tourists_{it}) = X_{it}\beta + a_i + u_{it}$$

(1)

In this case, every country has a certain index $i$, which can have values between 1 and 130. The index $t$ represents the time period and can have values between 1 and 5 (for the years 1995, 2000, 2005, 2010, and 2015, respectively). The vector $X_{it}$ contains all five independent variables that are expected to influence the variable $tourists_{it}$. Besides that, the vector $\beta$ includes all the unknown parameters of interest [Wooldridge, 2010, p.83], $a_i$ is the fixed effect, and $u_{it}$ is the unobserved error. The model is estimated using the fixed effects, followed by testing of the MLR assumptions.

5.1 Fixed Effects

The purpose of this section is to briefly present the concept behind the fixed effects estimation. Equation 1 can be expressed as following:

$$y_{it} = X_{it}\beta + a_i + u_{it},$$

(2)

where $y_{it}$ represents any dependent variable in a generalized way. Afterwards, the average values over time of all variables need to be calculated and then introduced in the form of equation 2. The last step is to get rid of the fixed effect through subtracting equation 4 from equation 2:

$$\bar{y_i} = \frac{\sum_{t=1}^{5} y_{it}}{5}, \bar{X_i} = \frac{\sum_{t=1}^{5} X_{it}}{5}, \bar{u_i} = \frac{\sum_{t=1}^{5} u_{it}}{5}$$

(3)

$$\bar{y_i} = \bar{X_i}\beta + a_i + \bar{u_i}$$

(4)
$$y_{it} = (X_{it} - X_i)\beta + u_{it} - \bar{u}_i$$  \hspace{1cm} (5)

5.2 MLR Assumptions

There are several Multiple Linear Regression assumptions that need to be tested in order to ensure that the estimators obtained are BLUE - Best Linear Unbiased Estimators, according to the Gauss-Markov theorem [Kariya, 1985].

The first assumption of linearity in parameters is met by the definition of equation 2. The second assumption of random sampling is not applicable since macroeconomic studies deal with the overall database instead of working with samples of it.

An important assumption that will be tested is no multicollinearity among independent variables, which means that they should not be strongly related to each other. According to [Wooldridge, 2010], multicollinearity becomes an issue when the variance inflation factor (VIF) is higher than 10:

$$VIF_j = \frac{\text{Var}(\hat{\beta}_j)}{\sigma^2} > 10$$  \hspace{1cm} (6)

Here, $\text{SST}_j$ is the total sum of squares of $j$, $\text{Var}(\hat{\beta}_j)$ is the variation of the slope $\beta_j$, and $\sigma^2$ is the variance of the error.

The Variance Inflation Factors for each of the included independent variable are shown in Table 1.

<table>
<thead>
<tr>
<th>Independent Variable</th>
<th>Variance Inflation Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>GDP per capita growth</td>
<td>1.0089</td>
</tr>
<tr>
<td>Emissions</td>
<td>1.0201</td>
</tr>
<tr>
<td>Economic freedom</td>
<td>1.1304</td>
</tr>
<tr>
<td>Intentional Homicides</td>
<td>1.0306</td>
</tr>
<tr>
<td>Education growth</td>
<td>1.1962</td>
</tr>
<tr>
<td>Dummy for the year 2010</td>
<td>1.1143</td>
</tr>
</tbody>
</table>

Table 1: VIF

As noticed, all indicators are substantially lower than 10, which implies the lack of multicollinearity among the included explanatory variables.

In order for the estimators to be BLUE, the variance of all the errors should be constant. If this assumption is violated, then heteroskedasticity is found. This is verified using the Breusch-Pagan test for heteroskedastic
disturbances [Breusch and Pagan, 1979], one for each regression. The results reveal the presence of heteroskedasticity since the null hypothesis of homoskedasticity is rejected under a p-value of $1.542 \times 10^{-12}$.

Besides that, there should be zero serial correlation between the disturbances of the same observation, but in different periods of time:

$$Cov(u_{ik}, u_{il}) = 0, \forall k \neq l, k, l = 1, ..., 5 \tag{7}$$

This assumption is verified using the Breusch-Godfrey test [Breusch, 1978]. According to it, the null hypothesis of no autocorrelation is rejected in favor of the alternative hypothesis since the p-value is equal to $2.2 \times 10^{-16}$.

Heteroskedasticity and autocorrelation were encountered as problems in the regressions. Thus, standard errors that are robust to the above-mentioned issues should be used instead of the default ones. [Newey and West, 1987] designed standard errors that can deal with these problems, and therefore will be presented in the Results section.
6 Results

The purpose of this chapter is to present the outcomes of the previously created model and to comment them using relevant theories and calculations. Table 2 shows the effect that various factors have over the dependent variable. Here, the coefficient of determination $R^2$ is equal to 0.574, which means that 57.4% of the variation in the tourism growth is explained by the included explanatory variables. It is a rather high indicator which demonstrates the validity of this study. That is because the number of tourist arrivals is affected by a multitude of details, many of them being qualitative and therefore hard to quantify, such as the cultural value of destinations or the popularity of certain nature reserves.

Table 2 shows the estimates related to each independent variable, as well as its statistical significance. The latter is also demonstrated through the t-values, which can be found in the parentheses under each estimate. Thus, we see that all variables, except for the dummy for the year 2010, are statistically significant at least at the 5% significance level. It proves the importance of these determinants in the tourism development.

According to the first independent variable, which is statistically significant at the 1% significance level, GDP per capita growth has the ability to positively influence the number of tourists arrivals in the future. In this case, the "log-log" model should be interpreted in the following way: a 1% increase in the GDP per capita will lead, after five years, to a 1.1084% increase in the number of tourists, keeping other factors fixed. Such a big influence comes from the fact that the economic development is strongly related to a series of other factors, such as economic openness and the number of operating businesses. This result demonstrates the fact that the relationship between tourism and economic growth is bilateral.
<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Tourism Growth</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(t-values are in parentheses)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>lag (GDP per capita growth)</td>
<td>1.1084***</td>
<td>(6.9498)</td>
</tr>
<tr>
<td>emissions</td>
<td>-0.0018***</td>
<td>(-4.4722)</td>
</tr>
<tr>
<td>emissions^2</td>
<td>-0.0001**</td>
<td>(-2.4311)</td>
</tr>
<tr>
<td>economic freedom</td>
<td>0.009**</td>
<td>(1.9858)</td>
</tr>
<tr>
<td>intentional homicides</td>
<td>-0.0076**</td>
<td>(-2.1518)</td>
</tr>
<tr>
<td>growth of education</td>
<td>1.506***</td>
<td>(7.3647)</td>
</tr>
<tr>
<td>dummy for 2010</td>
<td>0.0027</td>
<td>(0.0892)</td>
</tr>
<tr>
<td>Observations</td>
<td>517</td>
<td></td>
</tr>
<tr>
<td>R^2</td>
<td>0.574</td>
<td></td>
</tr>
<tr>
<td>F Statistic</td>
<td>85.580*** (df = 6; 381)</td>
<td></td>
</tr>
</tbody>
</table>

*Note:* *p<0.1; **p<0.05; ***p<0.01

Table 2: Overall Regression Results
As previously mentioned, the variable *emissions* has a quadratic form: $x + x^2$. Because of that, the interpretation of the coefficient that corresponds to this regressor is more complex. What can be concluded here is that the level of emissions over people’s decisions to travel is negative and statistically significant. Both independent variables that represent CO$_2$ have negative values and are statistically significant at the 1% and at the 5% significance levels, respectively. It means that higher emissions have a detrimental effect over tourism development even at low CO$_2$ levels, and the impact gets stronger once this independent variable increases its value. Ceteribus paribus, the nonlinear effect of this regressor over the level of tourism growth can be represented graphically as in Figure 3.

![Figure 3: Emissions - Tourism relationship](image)

There is a positive effect of a higher index of economic freedom over tourism growth, this variable being significant at the 5% level since its t-value is equal to 1.9858. Such an influence could be expected because economic liberty is generally beneficial for the country’s well-being. It is favourable for the state’s legal structure, facilitates the usage of alternative currencies, and benefits private ownership [Carlsson and Lundström, 2002]. As result, more people have incentives to open businesses, including the enterprises
related to tourism. This increases the variety of services provided in the
tourism industry. Consequently, it has a positive effect over the popularity
of the destination and enhances the number of visitors.

The level of security, expressed through the number of intentional homi-
cides per 100,000 inhabitants, is negatively associated with the number of
tourists visiting the country, and this effect is significant at the 5% level.
According to Ryan [1993] and as previously described in Chapter 3, the
relationship between crime and tourism exists, and it can be either direct
or indirect. Regardless of its nature, though, it is clear that more illegal
activity in the region will demotivate tourists from visiting it.

In the long term, education can be of the primary drivers of the country’s
economic development. Besides that, it also can have a positive effect over a
series of factors, such as firm performance [Wang et al., 2008] or productivity
of the workforce [Okoro and Washington, 2012]. The created model demon-
strates that education can also influence positively the growth of tourism in
the country. That is, keeping other factors fixed, a one percent increase in
the average years of schooling per person would lead to a 1.506% increase in
the number of tourists arrivals. This effect is rather indirect due to the fact
that education increases the human capital which, in turn, is expected to
escalate the efficiency of labour and the development of infrastructure. Be-
sides that, higher levels of education are strongly related to people’s cultural
and social tolerance and openness - factors that are crucial in the context of
international travels.

It is important to mention that the dummy variable for the year 2010
is insignificant. It means that, keeping other factors fixed, the post-crisis
year 2010 did not have a huge impact over the growth of tourism across
the globe. That is, the number of international arrivals slightly decreased
only for the year 2009, but its growth after that was rather steady and
continuous, as observable in figure 1. Therefore, the results obtained in this
study are in line with the theory previously presented in chapter 3, which
says that after the year 2009, the tourism sector recovered quickly and then
continued to develop steadily. It can, however, be supposed that the growth
would have been even more considerable if not the crisis. Such a hypothesis
is also supported through the fact that the number of international arrivals
increased even more between the years 2010 and 2015 than it was growing
between any other five-year period before that.
Figure 4: Number of international arrivals
6.1 Effects by region

Besides presenting and analyzing the overall results, it could be useful to divide the countries based on certain geographical, economic or social differences, thereby getting more specific outcomes and providing with more distinct policy suggestions. Thus, the initial dataset has been divided into the following groups:

1. Developed European countries (GDP per capita in 2015 > 15,000$)

2. Post-soviet and post-socialist states

3. Africa

4. Latin America

5. Big countries (> 750,000 km$^2$)

6. Small countries (< 50,000 km$^2$)

The same regression has been used as with the overall dataset, as presented in equation 1. Besides that, all the MLR assumptions have been verified according to the description in the Section 5.2. The numerical results of all the tests are shown in the Appendix. The following figure indicates the countries included in each dataset:

Figure 5: Regions

![Map of regions](image-url)
6.1.1 Developed European Countries

The choice has been made to filter only developed European countries because they share a series of geographical and economic characteristics. First, they are easily reachable among each other thanks to shorter distances than on other continents. Besides that, tourism in these states is encouraged through a developed transportation infrastructure and, lately, thanks to a variety of relatively cheap airplane tickets. Moreover, there is an increasing difference between the growth and the maintenance of infrastructure in developed and in developing countries, respectively. The states with lower GDP per capita cannot obtain the investments that this field is currently demanding, whereas more advanced countries encounter fewer problems in satisfying the infrastructure necessities [Ershova and Posokhov, 2016, p.818].

All these countries have quite high GDP per capita, which implies bigger personal earnings for each citizen. As result of income surpluses, people are willing to spend more on recreational activities such as traveling, and especially to neighboring countries. These common features could potentially result in interesting regression outcomes and in distinct conclusions regarding them. The regression results are presented in the first column of Table 3.

According to it, the number of international tourists arrivals in developed countries is not related to their previous economic growth. Such an effect is generally expected due to the economic convergence [Mankiw et al., 2007, p.220], which could subsequently be explained through the law of diminishing returns [Shephard and Färe, 1974, p.69]. It says that, as the country continues to develop, then its marginal gains to economic growth will get lower. Therefore, it can be assumed that after reaching a certain level of GDP per capita, the country’s level of economic development ceases to be a driving force for the tourism growth.

The statistically significant negative effect of the emissions on the number of tourists in developed countries could be explained through the environmental Kuznets curve [Cole et al., 1997]. It assumes that the relationship between the country’s level of economic development and its emissions is nonlinear, but rather has an inverted U-shape. That is, if the GDP per capita is high enough, then more economic growth would be associated with lower emissions. In our case, the vast majority of developed European countries have experienced an escalation in the number of tourists, but at the
### Table 3: Regression Results. Developed European & Post-Soviet and Post-Socialist

<table>
<thead>
<tr>
<th>Variable Description</th>
<th>Developed (t-value)</th>
<th>Post-Socialist (t-value)</th>
</tr>
</thead>
<tbody>
<tr>
<td>lag (GDP per capita growth)</td>
<td>0.0523 (0.9795)</td>
<td>-0.2021 (-1.4757)</td>
</tr>
<tr>
<td>emissions</td>
<td>-0.0003*** (-3.9221)</td>
<td>0.0001 (0.0052)</td>
</tr>
<tr>
<td>emissions²</td>
<td>-0.0001** (-2.1788)</td>
<td>0.0009*** (4.2269)</td>
</tr>
<tr>
<td>economic freedom</td>
<td>0.0127* (1.6896)</td>
<td>0.0382** (2.1305)</td>
</tr>
<tr>
<td>intentional homicides</td>
<td>-0.0831*** (-4.8694)</td>
<td>-0.0421* (-1.7559)</td>
</tr>
<tr>
<td>growth of education</td>
<td>1.8447*** (6.0739)</td>
<td>3.4732*** (3.4877)</td>
</tr>
<tr>
<td>dummy for 2010</td>
<td>-0.1139*** (-3.5291)</td>
<td>-0.1106 (-0.6949)</td>
</tr>
</tbody>
</table>

Observations: 121, 98

R²: 0.657, 0.433

F Statistic: 28.695*** (df = 6; 90), 9.162*** (df = 6; 72)

Note: *p<0.1; **p<0.05; ***p<0.01
same time lower CO$_2$ emissions. However, there is not only empirical correlation, but also logical causation between these two factors. Lower emissions are especially important in the context of nature-based and slow tourism, whose popularity has increased substantially during the last decades. Many developed countries have started to promote these kinds of tourism, thereby getting more visitors. However, since the variable $emissions^2$ is also negative and statistically significant, then a very big decrease in the level of emissions is expected to have a weaker positive effect over the number of tourists as previously described in Figure 3. One of the reasons might be the fact that international travelling is strongly related to high emissions coming from different ways of transportation. This negative effect partly cancels the above-discussed positive externalities. One can expect that more ecological transportation methods would contribute to lower CO$_2$ emissions related to tourism. Another conclusion consists in the fact that, in the context of sustainable destination development, decreasing the CO$_2$ emissions would be beneficial not only from the ecological perspective, but it will also serve as a primary driver for the subsequent touristic growth.

The level of economic freedom is a less important factor in determining the growth of number of visitors in developed countries because supposedly these states have already reached a high enough level of economic liberty, after which additional improvements become less relevant.

Particularly curious is the dummy variable for the year 2010, which demonstrates that tourism in developed European countries suffered more from the consequences of the 2008-2009 crisis than countries in the world on average. A reason might be the prices, which are generally not very flexible, but also rather high in more advanced countries. Consequently, during the first post-crisis years, many potential visitors were choosing less expensive alternatives.

6.1.2 Post-Soviet and Post-Socialist Countries

There is a big economic heterogeneity between various post-soviet countries. Some of them, such as the Baltic states, have successfully modernized their economy and chose the cooperation with EU as their main priority, whereas other ones have not registered substantial improvements in the macroeconomic indicators [Silagadze 2014 p.78]. Regardless of the fact that these states are currently experiencing different levels of economic development,
they still share a series of common features. During a big part of the 20th century, these were planned economies, in which indicators like the economic freedom were simply inapplicable. These states became free market economies at the beginning of the 1990s, which means that they had much less time for individual business growth and for building viable capitalist economies. Most importantly in the context of tourism, these states opened their borders for the international visitors only three decades ago. It means that the population in this region might be more conservative and might require more time for adaptation to the new socio-economic reality. The results of the regression using this dataset can be found in the second column of Table 3.

There is a positive relationship between the variable representing the second power of the CO$_2$ emissions and the number of tourists, whereas the variable that represents the linear effect of emissions on tourism growth is insignificant. It could be explained through the previously-mentioned environmental Kuznets curve. In this case, many countries are either relying on agriculture, or they are heavily industrialized. It means that they are yet to achieve the level in which more economic development is associated with lower emissions.

The index of economic freedom is particularly important in the post-socialist and post-soviet region, because the growth of businesses in these countries is extremely compressed: instead of taking hundreds of years, like in classical capitalist states, it takes only thirty. That is why even a small variation in the level of economic freedom could have dramatic effects over a series of other factors, including the number of tourists. The same change in the index of economic freedom is expected to influence the growth of tourism in post-socialist and post-soviet states three times more than it could in highly developed countries, for instance (0.0382 vs. 0.0127).

### 6.1.3 African Countries

As in the previous dataset with post-socialist and post-soviet countries, African states are very heterogeneous when it comes to the development of their infrastructure, of the economy, or of the human capital. For instance, [Von Maltzahn and Durrheim 2008](#) argue that, albeit many African countries suffer from poverty due to similar reasons and at alike levels, some particular indicators and elements of poverty tend to be individual for every
country.

Creating a particular dataset, for example, only for the Maghreb region, would have made more sense because of the similarities that these countries have. They also have strong relationships between their financial markets and almost identical monetary policies, thus having a great regional integration potential [Darrat and Pennathur, 2002]. However, including a smaller number of observations imply that losing too many degrees of freedom could be dangerous for the credibility of the results. Therefore, a big enough dataset containing 26 states has been used instead. The regression results concerning African countries can be found in the first column of Table 4.

<table>
<thead>
<tr>
<th>Dependent variable: Tourism Growth</th>
<th>(t-values are in parentheses)</th>
<th>1. Africa</th>
<th>2. Latin America</th>
</tr>
</thead>
<tbody>
<tr>
<td>lag (GDP per capita growth)</td>
<td>0.0431</td>
<td>0.0633</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(1.1837)</td>
<td>(0.6927)</td>
<td></td>
</tr>
<tr>
<td>emissions</td>
<td>−0.0141</td>
<td>0.0092</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(−0.0231)</td>
<td>(0.3444)</td>
<td></td>
</tr>
<tr>
<td>emissions²</td>
<td>−0.0001</td>
<td>−0.0004</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(−0.3212)</td>
<td>(−0.0023)</td>
<td></td>
</tr>
<tr>
<td>economic freedom</td>
<td>0.0152</td>
<td>0.0143*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(1.4731)</td>
<td>(1.9368)</td>
<td></td>
</tr>
<tr>
<td>intentional homicides</td>
<td>−0.0111</td>
<td>−0.0051*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(−1.5223)</td>
<td>(−1.9354)</td>
<td></td>
</tr>
<tr>
<td>growth of education</td>
<td>2.0554***</td>
<td>2.6404***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(8.8875)</td>
<td>(9.6079)</td>
<td></td>
</tr>
<tr>
<td>dummy for 2010</td>
<td>0.1953***</td>
<td>0.0418</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(3.8282)</td>
<td>(0.7440)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Observations</th>
<th>126</th>
<th>129</th>
</tr>
</thead>
<tbody>
<tr>
<td>$R^2$</td>
<td>0.617</td>
<td>0.559</td>
</tr>
<tr>
<td>F Statistic</td>
<td>$25.233^{***}$ (df = 6; 94)</td>
<td>$20.463^{***}$ (df = 6; 97)</td>
</tr>
</tbody>
</table>

Note: *$p<0.1$; **$p<0.05$; ***$p<0.01$

Table 4: Regression Results. Africa & Latin America
The results demonstrate the previously-mentioned contrast between various African countries. For instance, due to different GDP per capita levels, the effect of the additional economic growth is ambiguous: it could be positive for underdeveloped states and negative for more developed ones. Or it could be that this factor is generally not important in determining the level of tourism growth.

Due to the fact that, on average, people in African countries go to school fewer years than in more economically developed regions, even a small increase in the level of education is expected to have great effects over the development of tourism because it will be beneficial for a series of intermediate factors, such as labour productivity, infrastructure, and preservation of destinations.

The positive significant effect of the dummy variable for the year 2010 on the level of tourism growth is rather surprising. One would expect that the globalized nature of modern economies will result in similar effects of the crisis both on developed and on developing countries. Indeed, according to te Velde [2018], GDP in both groups of countries was negatively affected by 5-7%. However, due to the fact that African countries are growing at a higher pace, they supposedly required less time to recover. Besides that, the prices in this region could be substantially lower, which explains why some tourists might have chosen to visit Africa instead of a more expensive alternative. For instance, many Russian tourists found Egypt as a great substitute to the more costly Italy, Croatia, and Spain, for their summer holidays.

### 6.1.4 Latin American countries

In comparison with the previously discussed region, Latin America seems to be more homogenous from the economic, social, and cultural perspectives. The region is suffering from severe income inequality and rather low income redistribution from the richer to the poorer part of the population [Holland and Schneider, 2017]. Besides that, the development of tourism in the region is strongly related to the prices, the development and the availability of real estate [Gascón and Milano, 2018]. It is bought either using the national capital or with the help of external investors, who subsequently also determine its price.

According to the results shown in the second column of Table 4, more
economic freedom will likely have a positive impact over the tourism development. The reason behind that probably lies in the multitude of dictatorial regimes, such as the one in Argentina or in Chile. According to Frantz and Geddes [2016], the effects of the authoritarian rule are much longer than the regime itself. Therefore, even if some of these countries transformed into democracies long time before 1995 (the year with the earliest data in our dataset), the legacy of the totalitarian rule might still be strong. It means that the country might suffer from high levels of corruption, from weak institutions, and from the lack of entrepreneurial initiative. More economic freedom could motivate people to involve in business activities, thereby increasing the variety of services for the potential tourists.

Americas have an almost three times higher homicide rate than the world average (16.3 and 6.2 intentional homicides per 100,000 people, respectively). Criminality became one of the primary reasons why the great touristic capacity of the region is not fully used - many potential visitors avoid visiting Latin America due to safety reasons. The public perception of the region is worsened by media, which serves as catalyst to the already established stereotypes. Criminality is surely a major problem in Latin America because it is detrimental to a series of crucial socioeconomic factors, such as economic growth, political performance, corruption, interpersonal trust, and political institutions [Carreras, 2013]. The decrease in the rate of intentional homicides should substantially improve the overall situation in Latin American countries, subsequently improving their popularity among international visitors.

In both African and in Latin American countries, education represents a crucial tourism development factor also due to the law of diminishing returns. That is, due to fewer average years of schooling, even a small improvement in this field is expected to have substantial positive effects over tourism growth. According to Ardeleanu [2019], in order to achieve better access to education among more citizens, the policymakers need to decrease income inequality through higher levels of redistribution since this will serve as a development channel for many macroeconomic fields.

6.1.5 Small and Big Countries

The size of the country represents an important factor that determines the amount of government spending in various areas, and especially on infras-
tructure. Small countries, for instance, need to implement different development strategies because they are more vulnerable to negative trade effects, especially after the year 1995 [Singh and Prasad, 2008], which is the period studied in this paper as well. At the same time, [Van der Wal, 2017] argues that small states, although being often disadvantaged in the conditions of open economies, can achieve great social, governmental, and economic success if they are able to take the best out of their ”key resource” - people. In the case of this study, people’s performance can be estimated through the level of education. Also, one can expect that the development of infrastructure has a substantial effect over the quality of tourism in the region, which is closely related to its demand. The comparison of the regressions containing only small countries and only big countries can be found in Table 5, on columns 1 and 2, respectively. The minimum threshold for big countries was set at 750,000 km$^2$, and the maximum threshold for small countries was set at 50,000 km$^2$. The area of the country was chosen instead of the population because of the long-term stability of the former. In other words, population changes over time, which could substantially complicate the choice of the thresholds, whereas the areas are constant. The decision regarding these limits was based on the combination of the following factors:

1. Both subsets of the initial database need to be big enough to be able to apply the Central Limit theorem. Thus, each dataset needs to have at least 30 countries.

2. The dataset should not be bigger than 30% of the initial database

3. The sizes of datasets with both big and small countries need to be comparable

4. The thresholds need to be round numbers

According to the outcomes, keeping other factors fixed, decreasing the level of emissions is expected to have a positive impact over the number of tourists only in smaller states. This effect is probably related to a better and more dense infrastructure in countries with smaller areas. A more developed infrastructure implies a more intense usage of transport, for instance. Also, some small countries have a high level of economic development, which means that decreasing the level of emissions should have a positive effect over their economic development, according to the environmental Kuznets curve,
and subsequently improve the number of tourists. Other are heavily indus-
trialized, which implies particularly high levels of emission per capita as well. Once the country succeeds to lessen them, it can expect more tourist arrivals, especially in the nature-based field. It is important to mention that the effect is only linear and it is insignificant at the second power. It means that, albeit decreasing the emissions can have a positive impact over tourism growth, the number of visitors will not escalate because of that, but will rather change linearly.
Dependent variable: Tourism Growth

(t-values are in parentheses)

<table>
<thead>
<tr>
<th>1. Small states</th>
<th>2. Big states</th>
</tr>
</thead>
<tbody>
<tr>
<td>lag(GDP per capita growth)</td>
<td>1.0073***</td>
</tr>
<tr>
<td></td>
<td>(3.0194)</td>
</tr>
<tr>
<td>emissions</td>
<td>-0.0002**</td>
</tr>
<tr>
<td></td>
<td>(-2.1127)</td>
</tr>
<tr>
<td>emissions²</td>
<td>-0.0039</td>
</tr>
<tr>
<td></td>
<td>(-0.1233)</td>
</tr>
<tr>
<td>economic freedom</td>
<td>0.0149</td>
</tr>
<tr>
<td></td>
<td>(1.5030)</td>
</tr>
<tr>
<td>intentional homicides</td>
<td>-0.0008</td>
</tr>
<tr>
<td></td>
<td>(-0.2454)</td>
</tr>
<tr>
<td>growth of education</td>
<td>1.3651***</td>
</tr>
<tr>
<td></td>
<td>(2.8489)</td>
</tr>
<tr>
<td>dummy for 2010</td>
<td>0.0284</td>
</tr>
<tr>
<td></td>
<td>(0.6437)</td>
</tr>
</tbody>
</table>

Observations 147 119  
R² 0.546 0.662  
F Statistic 20.832*** (df = 6; 104) 27.077*** (df = 6; 83)

Note: *p<0.1; **p<0.05; ***p<0.01

Table 5: Regression Results. Small & Big Countries

At the same time, developing a good tourism infrastructure involves building roads, railways, airports etc. Jovanović and Ivana [2016], and it represents a bigger part of the government spending in countries with big areas. The average costs for every additional tourists might be too high, which explains why developing an ideal infrastructure is not a statistically
significant factor among big states.

Keeping a safe environment is also more complicated in big states because the number of police officers is often inadequately low in comparison to the vast area. Conflicts between various ethnic and religious groups are also more likely to happen in such regions. As a result, many tourists are especially concerned about safety in the remote areas of big states. It means that decreasing the criminality rate would definitely attract more visitors to certain distant destinations, thus using the whole touristic potential of the country.
7 Conclusion

The tourism sector represents a very important economic driver, serving as a factor that can contribute to the development of infrastructure and that can substantially reduce the unemployment in the region. This effect is widely known and recognized. However, the inverse effect that various factors have on tourism is less studied. Thus, the purpose of this paper was to contribute to the existing literature through investigating the impact of five socioeconomic and demographic indicators over tourism growth. In other words, the purpose of this paper is to shed light on the effect that various factors have over the development of tourism. It starts with an overall literature review, followed by useful theories, then by the data collection methodology and by the ways of processing the data. Afterwards, all the relevant results are presented and subsequently discussed. In the dataset that includes all 130 studied countries, each variable is significant at least at the 5% significance level. That is, a worse ecological situation and a less safe environment are expected to have a negative effect over tourism growth, whereas the overall economic growth, as well as more economic freedom and higher levels of education are expected to influence the development of tourism in a positive way. Such a conclusion is logical and comes in line with the expected outcome of such a regression.

Afterwards, the dataset has been divided based on various economic, social, and geographical factors. Among developed European states, the dummy variable for the year 2010 is negative and statistically significant, which means that the 2008-09 economic crisis had a particularly strong effect over these countries’ citizens travelling decisions. Among post-soviet and post-socialist countries, the index of economic freedom had been identified as a crucial development factor, the reason for that being the economic past of these states. High heterogeneity between various African states led to effects that are somewhat less significant. However, the development of tourism on this continent is expected to benefit a lot as a result of improved education levels. Schooling is also a crucial tourism development factor in Latin American countries, as well as the economic freedom and safety. Finally, when comparing particularly big and small states, decreasing the amount of CO$_2$ emissions will have a positive effect over tourism growth only among the latter. At the same time, economic freedom and safety are
crucial determinants of tourism development only in big states.

An important note should be dedicated to the notion of tourism development, which is in reality much more complex than just a quantitative increase in the number of tourists. The development of tourism represents an improvement in the quality of tourists and in their ability to pay, as well as in their personal experiences and behaviour during the visit. Moreover, in many regions that suffer from overtourism, the development also implies a substantial reduction in the number of visitors. These limitations are, however, the consequence of a purely quantitative research. In other words, since tourism development is an extremely complex concept, quantifying it in a precise but also individualistic way is very complicated if not impossible. Therefore, such simplifications are unfortunately necessary, as they allow the researcher to give reliable and universally applicable results.
References


P. Haxton. A review of effective policies for tourism growth. 2015.


WB. Intentional homicides per 100,000 inhabitants, 2021c. URL https://data.worldbank.org/indicator/VC.IHR.PSRC.P5


### Appendix

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Table 6: List of countries included (1)
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Table 7: List of countries included (2)