

Low Cost Air Travel: Spreading its wings in former Yugoslavia

Has the introduction of low cost flights had a significant influence on passenger traffic in five different countries in former Yugoslavia?

Abstract: After the breakup of Yugoslavia, the newly established countries had to rebuild their infrastructure. One of the issues was attracting air traffic to their national airports. Apart from the early years, this research focuses on whether the introduction of low cost air travel has contributed to the passenger growth that was recorded in the past years. I estimate that there is a unique effect of LCCs (Low Cost Carriers) apart from an effect through economic indicators.

Though LCCs can contribute to the development of passenger numbers and perhaps the economy, the fragile situation in the region as well as the approach of governments to this issue is addressed as potential reason for sub-optimal performance.

Keywords: Former Yugoslavia, LCC, Aviation, Economy, Primary Airports, Passenger Numbers

Name and Student Number: Bojan Breljaković - 336260

Faculty: Erasmus School of Economics

Master: Urban, Port and Transport Economics

Thesis Supervisor: P. van Reeven

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Preface

In a world where travelling is considered essential, be it for economical reasons, spiritual reasons or pure leisure travel, low cost carriers have had a great impact on the accessibility of certain regions and an impact on the mobility within these regions.

Coming from Former Yugoslavia it was very interesting to examine the effects of LCCs on the region itself. I have attempted to keep personal experience and opinions to a minimum and have only added these if deemed relevant and when it could be supported by facts.

I would like to thank Peran van Reeven for his supervision and guidance. No question was left unanswered, as tiny as it may have been. He would always make time available and there was even room for a joke or two. This atmosphere most definitely helped me get the most out of the whole process.

Finally, my colleagues at Gemini College deserve to be mentioned as they constantly kept me motivated and kept me aware of the fact that teaching wasn't my only job.

Chapter 1. Introduction

In the early 90's, the area once known as the Socialist Federal Republic of Yugoslavia started falling apart. After the death of Marshal Tito, the communist system could no longer fight the battle against nationalism. Pride, prejudice and lies resulted in conflicts: only people from the same ethnicity were supposed to bond. Bloody wars all over the region resulted in the creation of several new nations. The republic fell apart into: Slovenia, Croatia, Bosnia and Herzegovina, Macedonia and Serbia. Later on, in 2006 and 2008 respectively, another two separate nations were formed: Montenegro and Kosovo, although the latter is still being disputed by some.

After the demise of Yugoslavia, one of the questions was: how will air traffic re-establish itself in the region? A lot of the infrastructure was gone and the airline that once covered the whole of the region would now only be Serbia's national airline, keeping all the assets in Serbia. The other countries had to consider whether a national carrier would be established and how new airlines as well as more passengers could be attracted to the airports.

The first issue was one of national pride, hence the creation of (or attempts to create) various national carriers. The latter problem is a more interesting one, especially in recent years. The early years were about attracting airlines and perhaps forming a flag carrier. The past 7 or 8 years have shown the introduction of low cost carriers to the region. It is most interesting to assess their contribution to the development when taking a look at for example Bosnia and Macedonia. At first glance, they appear to be comparable countries. Looking at their major airports, Skopje and Sarajevo, a different trend in passenger traffic is visible. This is especially the case for the years 2010-2013. The interest on LCC¹s comes from an article published by Wizz Air², in which it says to have transported over 370,000 passengers to and from Skopje in 2013. Sarajevo International Airport transported around 320,000 passengers less than Skopje airport in 2013 and it only has limited LCC presence when compared to Skopje.

In order to get more insight on how these passenger numbers have developed and whether that coincides with LCCs joining the market, it is interesting to see if there is a relationship between the two. The specific region (Former Yugoslavia) is interesting for multiple reasons.

¹ LCC is short for Low Cost Carrier and is used throughout this research as an abbreviation.

² http://wizzair.com/en-GB/about_us/news/wizen232 (last accessed June 26th)

First of all, a lot of air carriers are starting to (re-)discover this area and expand rapidly in it. In the past years, passenger growth ranging from 5-10% was no exception. On the other hand there are established Star Alliance and flag carriers. Do their moves impact traffic flows, are others forced to change strategy because of other developments?

In order to research whether the attraction of low cost airlines has actually improved passenger traffic at the airports, the primary research question is: *Has the introduction of low cost flights contributed to the growth and recovery of aviation in five different countries in former Yugoslavia?*

To be able to provide answer to this question I first define what the actual drivers behind growth of aviation in a country are. The relation between certain (economic) factors and aviation is assumed to be there, but what are these factors and are there any specific criteria for this region. This is then applied to the countries in the dataset for this paper by providing their characteristics in aviation and the development of relevant economic indicators. After the provision of data and the literature review I make my own statistical analysis in the form of a panel data study. The cross-sectional data comes from five different countries: Belgrade (Serbia), Pristina (Kosovo), Sarajevo (Bosnia and Herzegovina), Skopje (Macedonia) and Zagreb (Croatia).³ The choice of these airports is based on different criteria and especially as there are quite some differences among them as discussed later in Chapter 3. The base of the analysis is formed by quarterly passenger statistics for all these airports ranging from 2004-2013, whereas the division among other airlines as well as the state of the flag carrier is also mentioned.

The sub-questions that go with this analysis are:

- What factors influence the development of aviation in a country?
- A profile of the former Yugoslav countries: How have the key factors developed as well as aviation in these countries?

³ Other airports such as Ljubljana (Slovenia) and Podgorica (Montenegro) were excluded based on the fact that these airports are dominated by the flag carrier of that particular country. On top of that, these airports receive little to no low cost air traffic and therefore appear to make no real contribution to this research.

- Statistical Analysis: Is there any evidence to be found of the factors influencing aviation development using panel data?

I find that there is evidence of LCCs supporting passenger growth apart from the usual trend. A significant positive effect is found between the number of LCCs present and passenger numbers at that particular airport. Although previous research thoroughly examines and establishes a relations between GDP and passenger growth this is only partially found in this thesis. There is a positive relationship, but the magnitude remains unclear as it is not significant.

The rest of the paper is structured as follows. At first, Chapter 2 gives a literature overview of which (economic) factors are responsible for growth in aviation in a certain country. This chapter is based on an extensive literature analysis to establish a baseline and a framework for this research. Chapter 3 provides information on the countries used for this research. Economic figures are presented to get a better understanding of the current and past situation in the region. Furthermore, a brief overview of the division of carriers operating at these airports is provided.

Chapter 4 then gives the data used for this thesis. Also an explanation of the methods is given to clarify how the results are obtained. This is followed by Chapter 5, in which the actual analysis takes place and thus is mostly based on calculations to find evidence to support or tackle the research question. Results that are obtained from the analysis are presented in this chapter as well.

This leads to Chapter 6 that summarizes the main conclusions of this thesis and provides useful insights in the topic and possibly beyond. As no research is perfect, Chapter 7 finishes off by providing discussion on and limitations of the research that was conducted as well as recommendations for future research, also by providing some developments in the past few months that were too recent to incorporate in this thesis.

Chapter 2. Economic indicators of aviation growth

To construct a feasible and credible analysis, it is important to establish a base from where the data is analyzed. If there is a contribution from LCCs to passenger numbers at certain airports then it is relevant to find out what factors drive aviation growth in general. This allows for comparison of figures (for example) before and after the arrival of LCCs. This chapter presents an analysis of existing literature that examines the relation between economic indicators and the growth of aviation in a country.

2.1 Dependent Variable - Passenger Numbers

This thesis uses the growth in passenger numbers to test whether a relation between aviation growth through LCCs and economic growth exists. Passenger numbers are influenced by many factors. This thesis focuses on key (economic) indicators as found in previous studies. This variable is chosen to enable the focus on LCCs. Dobruszkes (2006, 2009) states that the number of passengers on relations between Western and Eastern Europe have significantly increased since LCCs entered the market. Furthermore, Francis et al. (2003) estimated that by 2010 the share of LCCs in short haul intra-European services would be close to 33%. LCCs are even interesting for airports, even though they usually demand lower handling fees before any contract is signed. This is due to the fact that LCCs usually lead to higher passenger numbers, because of their lower ticket prices (Francis et al. 2003.) This explains the use of passenger numbers as dependent variable, the next sections discuss the several independent variables.

2.2 GDP

On a first glance it seems logical to have a relation between GDP and aviation. Solely based on the thought that people who earn more are more likely to take a(n extra) trip and/or travel by plane. Marazzo et al. (2010) are one of the latest that provide insight into this. By taking the country of Brazil as an example they research the relationship between GDP and the demand for air travel (expressed in passenger-kilometer.) This research focuses in a similar way, be it on passengers per year rather than passenger-kilometers per year.

A first indication for the relation between GDP and passenger numbers is provided by Ishutkina (2009) who elaborates on the general relation between GDP and number of passenger per year. A quadrant is developed to estimate the probability that a synchronized

movement of GDP and passenger growth occurs. In 70% of the cases examined both variables move the same way. This still leaves 30% of the cases open for interpretation. A total of 9% of the cases saw a decrease in GDP, yet an increase in the number of passengers. One aim of this research is to examine if LCCs spark this growth. Furthermore, aviation is described to be a facilitating factor for economic growth as it links different economies.

If GDP plays a role across the globe it could be beneficial to take a look at GDP per capita as well. To establish (disposable) income on an individual scale provides more information on people's ability to travel in terms of financial means. This relationship seems to hold as illustrated by Crouch (1992,) who goes more into detail on GDP by researching the relationship between increased incomes and changing travel behavior. This relationship appears to be more complicated than what would arise from just common sense, particularly on the different types of holidays. Crouch (1992) continues to explain that it all depends on the type of holiday and the perception of that holiday. It does not necessarily mean that with increasing income, the amount of holidays taken rises in a similar fashion. There is more to it. He explains it as international tourism being considered a luxury good and therefore might also decline as the trips need not occur more often but just become more expensive. In the case of Former Yugoslavia it is particularly interesting as the countries that emerged from it developed in various ways.

Whether or not this relationship holds remains to be seen. Although it appears to be distilled in Marazzo et al (2010) as well, there are some differences. As income increases (GDP) the total amount of passenger kilometers also shows a significant increase. When passenger kilometers change first however, GDP does show an effect, but not on the same scale. The results of Crouch (1992) are thus somewhat contradictory to these results as he argues that Passenger kilometers do not necessarily have to go up.

2.3 Unemployment

Accepting GDP (per capita) as a variable for the development of aviation (Crouch, 1992; Ishutkina, 2009) it could also be worthwhile to check whether unemployment plays a role in this story as disposable income seriously depends on this variable. A country with high unemployment rates could experience more domestic tourism or with other means of transport apart from flying. Besides elaborating on the division of GDP in a country in some way, this also scales down the part of the population that is able to engage in regular travel.

The aforementioned could also provide airlines with information about possible population target sizes.

2.4 Trade

Apart from passengers, airlines obviously monitor the ties between countries as well. One example is given by Wizz Air. The airline stated⁴ that the introduction of flights between Skopje and Paris in April 2014 was also based on figures that showed trade between the two countries had increased by more than 20% in 2013. Not only ties between countries, but general linkage between regions plays a role. Thus trade appears to have an impact in the development of aviation and the sustainability of routes. In a report by Pearce (2013,) chief economist at the IATA⁵ organization, it is stated that almost 35% of all trade on a global scale now takes place via air.

Trade, just as FDI, is known to have a positive effect on GDP and development in general. Makki and Somwaru (2004) confirm this in their research on the effect of FDI and trade in developing countries. Even though the effect of trade is smaller when compared to FDI in their research, trade is considered less dependent on specific economic policy of the country in question. The variable trade is therefore introduced as a proxy for the original choice of FDI.

2.5 LCC Operations

A report by Oxford Economics (Author Unknown, 2011) shows the economic benefits because of aviation in Hungary in 2009. Hungary at that time could be seen as a reference country for at least Zagreb (Croatia) and Belgrade (Serbia), apart from geographical position it had its own airline (Malev) at Budapest airport that acted as a hub thus people used it as a transfer airport. It first focuses on the trade side of the story, where connectivity through air travel allows for opening new foreign markets for exports and local businesses. This is further supported by Smyth and Pearce (2007), who show that there is a significant relationship between the amount of air connections a country has and the labor productivity in that country. They go on to discuss that the economic impact is usually bigger in developing economies. Furthermore, new processes could be used in managing inventory and delivery as air links provide a much faster alternative compared to other means of transport. A process that works both ways, as the domestic companies can expand their markets beyond the border, and foreign businesses can explore the Hungarian market. This on its turn

⁴ http://wizzair.com/en-GB/about_us/news/wizen244 (last accessed July 7th)

⁵ International Air Transport Association

incentivizes all companies involved to make their processes more efficient and drive costs down as the competition increases (Author Unknown, 2011.)

To illustrate the effects of connectivity Smyth and Pearce (2007) provide an example of air services between Poland and the UK shows that the benefits of being connected increased the contribution of aviation to GDP by more than 25%, whereas this effect in the UK was less than 1%. As the countries in this research are also still developing and/or not part of the first world countries this can apply for them as well. Poland was already a member of the EU, but as stated by the authors, the effects are usually stronger in developing countries. To provide an illustration of the impact of LCCs it is nice to show that the five biggest airports in Poland offer 40 different routes to the UK. Of these 40 routes, only 2 are operated by national carriers, and both are operated from Warsaw. This means that the impact from LCCs, with 38 routes is expected to be considerably higher. As mentioned earlier, Dobruszkes (2006) supports this claim by proving the influence of LCCs on specific intra-European routes.

2.6 Airport privatization

Aviation, as many other businesses, is often privatized. This could impact the behavior of management and investment possibilities. In general, it could be an indicator of how the company will impact the economy according to Ishutkina (2009.) Whether it is for a government to gain quick access to new capital or to propel the aviation business it impacts local economy in both scenarios. This is the case in general, based on the findings by Ishutkina. For this research however, all the national carriers involved were state owned in the ten year time span used (2004-2013.) The only exception is B&H Airlines from Bosnia and Herzegovina in which Turkish Airlines had a 49% stake during some of the years.

The airports are also mainly publicly owned and operated. To be more precise, Sarajevo Airport (Bosnia) and Belgrade Airport (Serbia) have been and are currently publicly owned and operated by companies from the country itself.

The other airports are operated with a slightly different structure. Zagreb Airport (Croatia) has awarded a concession to the French company Aeroports de Paris, which lasts 30 years. This only happened recently (2012) and the impact on the research remains to be seen as most of the promises and demands still have not been realized. Pristina Airport in Kosovo was privatized in 2010, when Aeroports de Lyon together with Turkish LIMAK Holding Group won a 20 year concession to operate the airport. The oldest concession held by a

foreign firm is found in Skopje (Macedonia,) where TAV from Turkey holds a 20 year concession to operate both airports in Macedonia since 2008.

These concessions often bring new strategies to airports, aimed - almost without exception - at expanding the LCC presence at the airport. Even though low yield passengers might be attracted more to aviation when LCCs enter the market, it remains to be seen whether this works in all cases. In the case of LCCs it is of interest to see what effect it sorts combined with tourism. Because of the low pricing system one could argue that it makes flying accessible to more people. According to Graham and Shaw (2008) no real effect is found on the (average) type of person that travels now that LCCs have entered the market based on reviews by the British CAA in 2006. They claim that the same socio-economic groups that were already used to travelling by plane have just increased their frequency of travel with a wider variety of destinations being available at lower prices as well. This could be an explanation as to why LCCs kept growing during the economic downturn in the late 2000's while aviation in general halted and even decreased. Although Franke (2004) counteracts this partially by explicitly stating that LCCs do attract very low-yield passengers who have only decided to fly because of the (ultra) low fares and would have chosen alternative transport or not even taken the trip if this form of aviation hadn't existed.

Graham and Shaw (2008) elaborate by making a reference to the important contribution to tourism of aviation, hence the other way around. It would however be quite difficult to use these numbers in this research. As the focus is on 4 (almost completely) landlocked countries and one big player in the tourism market (Croatia,) which would make comparison more complicated. Furthermore, as this study focuses on single airports rather than countries, the effects found are likely to be skewed or biased. This is especially for the case of Croatia, where tourism is mostly consumed through other airports than Zagreb.

2.7 Diaspora

Apart from travel there is one variable in particular that must not be excluded, especially when looking at the region of Former Yugoslavia: the diaspora. Diaspora is defined as '*the dispersion or spread of any people from their original homeland.*' As argued by Rajé (2011) the relation between aviation and diaspora (ethnicity) is an area within the field that has not gotten the attention it deserves. As mentioned earlier, there are of course people who visit the cities that comprise this research for touristic purposes. City-breaks or part of a tour group, several reasons can be given. However, 'tourism' can also be based upon ethnicity. As Rajé

(2011) demonstrates with her Caribbean example, flag carriers of both countries involved can benefit greatly from examining relationships between the country the diaspora currently resides in and the home country of these people. Air links are not only important for passenger numbers but also for the home country itself. Remittances are considered a good indicator. In general this comes down to the money flowing back from the diaspora to the community in the home land. This is supported by a report from the Kosovar Forum for Democratic Initiatives (Haxhikadrija et al, 2009) who show that in 2000, around 17,5% of Kosovar GDP came from remittances provided by diaspora abroad. In the same report it is suggested that visits by diaspora (in the case of Kosovo often by plane) directly contribute to the local economy.

Rajé (2011) elaborates further on the psychological side by stating that a direct air link to the country of origin could reinforce ties and make the feelings about home more expressive and intense. One could argue that such actions could even increase frequency of travel, Tölölyan (2007) however states that the generation of diaspora is important as well. The problem that arises when defining diaspora solely as stated is that certain effects are ignored. After the Second World War, a large number of Croats settled in Latin America. The question is whether they still have an association with their homeland or if they've become part of the new country. That the situation in Former Yugoslavia is specific can be supported by Tölölyan (2007,) who argues that diaspora communities formed after a catastrophe, such as war, can hold stronger links to the homeland expressed in amount of visits and for how many generations this goes on.

2.8 Population

As the GDP variable is taken per capita and the diaspora is used as a ratio relative to total population, it seems logical to insert population as a variable in the model. Dobruszkes et al. (2011) consider population as one of the three main determinants used in models that estimate passenger flows and airline decision making. Apart from diaspora which is at first an inbound and later on an outbound flow, the population (combined with GDP) can provide more insight on the travel behavior of the inhabitants of a country. Furthermore, it could even help define whether an airport is a transfer-hub, if passenger numbers are significantly higher than the population numbers.

2.9 Summary

This Chapter has provided an insight on what important (economic) factors are when it comes to assessing the impact on aviation as well as the same relationship vice versa. As shown in Table 1, the way in which aviation growth is measured in this research is passenger numbers on capital airports (expressed in absolute numbers as well as growth.) It then also provides the independent variables used for this research.

Table 1. Dependent and Independent variables

Dependent Variable	Data	Source
Passenger Numbers	The amount of passengers passing through an airport (Quarterly data)	Official Airport Statistics Civil Aviation Agencies
Independent Variables	Data	Source
GDP	Millions of USD, as well as LCUs	Marazzo et al, 2011; Phu, 1991; Crouch, 1992
Unemployment Rates	Percentages	Crouch, 1992
FDI	Currency used	Pearce, 2013
Trade	Import / Export values	Makki and Somwaru (2004)
LCC Operations	Number of unique (LCC) air links at airports researched	Author Unknown, 2011 Franke, 2004 Smyth & Pearce, 2007
Privatization	Airport Operator	Ishutkina, 2009
Diaspora Size	People abroad with similar ethnicity	Rajé, 2011 Haxhikadrija et al, 2009 Tölölyan, 2007

The most pressing independent variable appears to be GDP (a.o; Marazzo et al. 2011) and/or GDP per capita, as argued by Phu (1991); Crouch (1992), size of diaspora (Rajé 2011); Trade (Makki and Somwaru, 2004) and the operations of LCCs (a.o.) Franke, 2004. Considering the importance of GDP (per capita) it is reasoned that unemployment rates may also play a role as they could depict the actual meaning and division of GDP (per capita), thus illustrating how many people actually have a fixed income and are therefore more likely to travel.

Chapter 3. A profile of the former Yugoslav countries

In order to start a framework and understand why certain things might arise from the results I take a look at the countries involved in order to get a better image of the situation. The key economic indicators as described in Chapter 2 are applied. Various data on aviation is provided as well. I take a look at the state of the national flag carrier, if there is any. This could be a stable factor contributing to passenger numbers rising at an airport as well as the presence of LCCs. Furthermore the division of passengers per airline (destination) is given where available. As none of the airports in former Yugoslavia have a direct air link with Northern America or Oceania, flag carriers / full service carriers can still have a significant role in the air transport market when it comes to transfer passengers for instance.

Dobruszkes (2009) shows the total break-down of low cost flights in Europe significantly changed between 2004 and 2008. In 2004, only 4% of all low cost flights connected a Western city to a city in Eastern Europe. Based on seat distribution this was only 2%. In 2008 this number has increased to 21% for flights, and 13% for all available seats, with a further increase to 14% in 2012 (Dobruszkes, 2013.) This chapter aims to elaborate on this development by providing current LCC penetration among the airports.

3.1 Bosnia & Herzegovina

Bosnia and Herzegovina is a country that perhaps had to recover the most from the devastating war that lasted from 1992 up until 1995. After the Dayton Peace Agreement had been signed on December 14th 1995, reconstruction could begin. A lot had to be done in all sectors of the country, ranging from administrative and legislative tasks to rebuilding infrastructure and job creation. As Tzifakis and Tsardanidis (2006) argue, the first ten years after the peace agreement could be considered as lost to a certain extent. It is not the case that nothing happened, perhaps expectations just weren't met. They further argue that there was plenty of (financial) aid coming in to the country but because of administrative and political lag and corruption, not much of it came to the right place. This is backed by Divjak and Pugh (2008,) as they state that even in the early 2000's there was a thin line between crime and politics. Sadly a link with aviation can be made as well, as the director of Sarajevo International Airport is currently under investigation for corruption. So is his son, who happens to be the marketing director of the airport.

3.1.1 Main Economic Indicators

Apart from these problems, when looking at global economic indicators we can for instance obtain that Bosnia has been fighting against high unemployment. Over the past 15 years, official unemployment rates have been constant at around 44% of the population. As there is a large grey/black economy in this country the real number of people without an actual job is deemed to be lower. These figures are ignored in this paper and only official statistics are used even if it might be sub-optimal in some cases.

Bosnian GDP grew with around 6% per year until the global economic crisis struck in 2009. Bosnia's economy shrunk by almost 3% and has had a tough time to recover from it since then. Minor growth in 2010 and 2011 was offset by another negative in 2012 when GDP shrunk by around 1%. After the double dip in 2012 growth appears to recover slowly with a recorded growth of 1.3% in 2013.

Figure 1 illustrates that there appears to be no clear relation between the growth in GDP and the growth in passenger numbers (i.e. aviation.) The only visual relation that can be obtained is that the variables move in the same direction, with a leading role for passenger numbers.. GDP growth is presented both in US Dollars as well as in Local Currency Units to exclude possible strong exchange rate fluctuations and other issues that may occur that lead to discrepancies in comparing with passenger growth rates. The two values do not differ a lot compared internally. In the years leading up to the economic crisis, passenger growth appears a leading indicator for GDP development. Later on, changes look as if they occur in the same year but with more volatility in passenger growth. 2008/2009 and 2013 are the years in which most changes occurred at Sarajevo airport concerning LCCs.

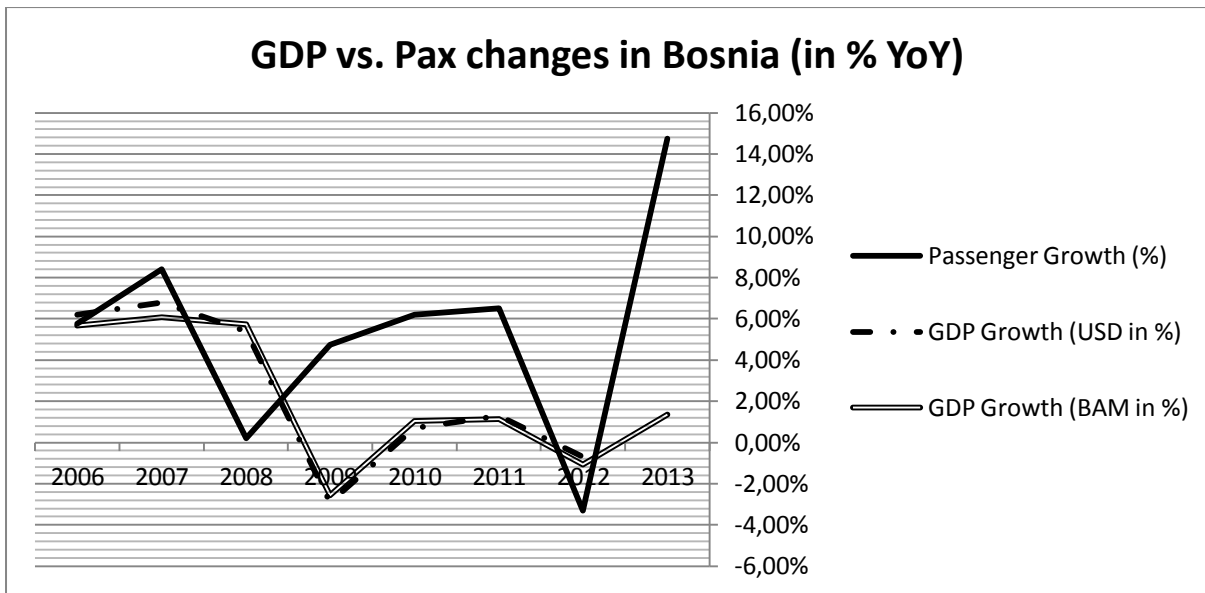


Figure 1. Relation between GDP growth and Passenger growth in Bosnia

3.1.2 Bosnian Diaspora

In ‘Bosnian Migrants,’ Valenta and Ramet (2011) state that there are approximately 1.4 million Bosnians that live outside Bosnia. In the 2011 Bosnia and Herzegovina Migration Profile provided by the Ministry of Security this figure is estimated around 1.8 million people, including second and third generation. With a population of just over 3.8 million living within Bosnia and Herzegovina this would mean that around 32% of the population lives abroad. Figure 2 gives an approximate breakdown of the countries where the Bosnian diaspora resides based on the figures provided by the ministry of Security.

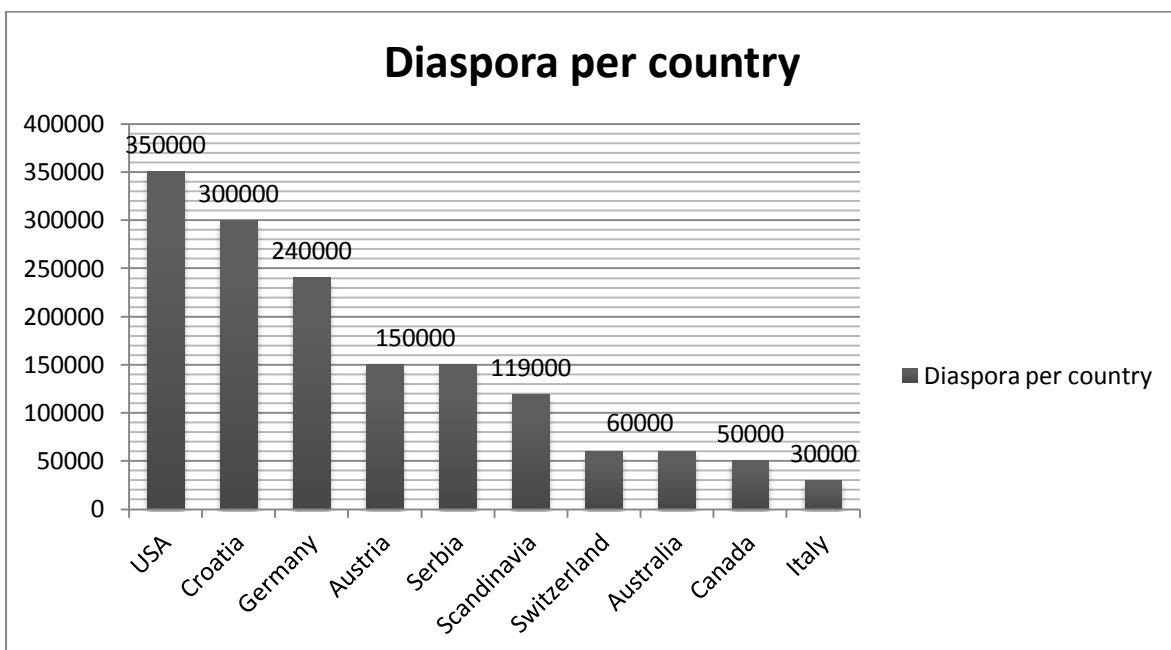


Figure 2 Bosnian diaspora per country

3.1.3 Sarajevo Airport

Sarajevo Airport was cleared for civilian traffic in August 1996, with Croatia Airlines being the first airline operating a scheduled flight when it opened the Zagreb-Sarajevo line. In the years that followed established carriers such as Lufthansa, Austrian Airlines, Adria Airways and Turkish Airlines joined. - What needs to be noted is that these are all Star Alliance carriers, so perhaps this is a proper example of co-opetition. - The airlines would like to take each other's passengers, yet they do code-share⁶ on each other's flights. - By the end of 2001 the passenger number had already risen to well over 300 thousand passengers and nowadays the airport handles over 600 thousand passengers yearly as can be seen in figure 3. Popular destinations include Munich and Vienna, which seems to match the previously provided diaspora figures.

Nowadays Sarajevo Airport is also home to B&H Airlines, the national carrier of the Muslim-Croat Federation of Bosnia and Herzegovina (Republika Srpska, the other entity, does not participate in this project.) The company was established in 2005 as a successor to Air Bosna which went bankrupt and left the country without a national carrier for just under two years. B&H Airlines is a fairly small company and operates just two regional turbo-prop aircraft. As mentioned in Chapter 2, B&H Airlines of Bosnia was the only national carrier to be briefly semi-privatized in the time span of this research. Back in 2009, Turkish Airlines joined in a strategic partnership with the company which saw its passenger numbers rise. Turkish Airlines acquired a 49% stake in the airline, with the government still holding the remaining 51%. As mentioned by Ishutkina (2009) it becomes clear that this had a positive impact on passenger numbers. At the peak in 2010 they had 4 operating aircraft, of which two jet aircraft and almost 140.000 passengers were transported. That made for a market share of almost 25% that year. However, figure 3 illustrates that B&H Airlines hasn't been the most stable partner for Sarajevo airport. In 2011, Turkish Airlines pulled out after a dispute with the major shareholder, the government of the Federation. Since then, the jet aircraft were taken and B&H Airlines' numbers have been steadily decreasing, dropping to just over 30.000 which represents a market share of 4,8% for the year 2013.

⁶ A code share is when for instance Austrian Airlines operates a flight with their flight number, crew and aircraft but another airline (i.e. Lufthansa) can also sell tickets with their prefix and flight number for this flight.

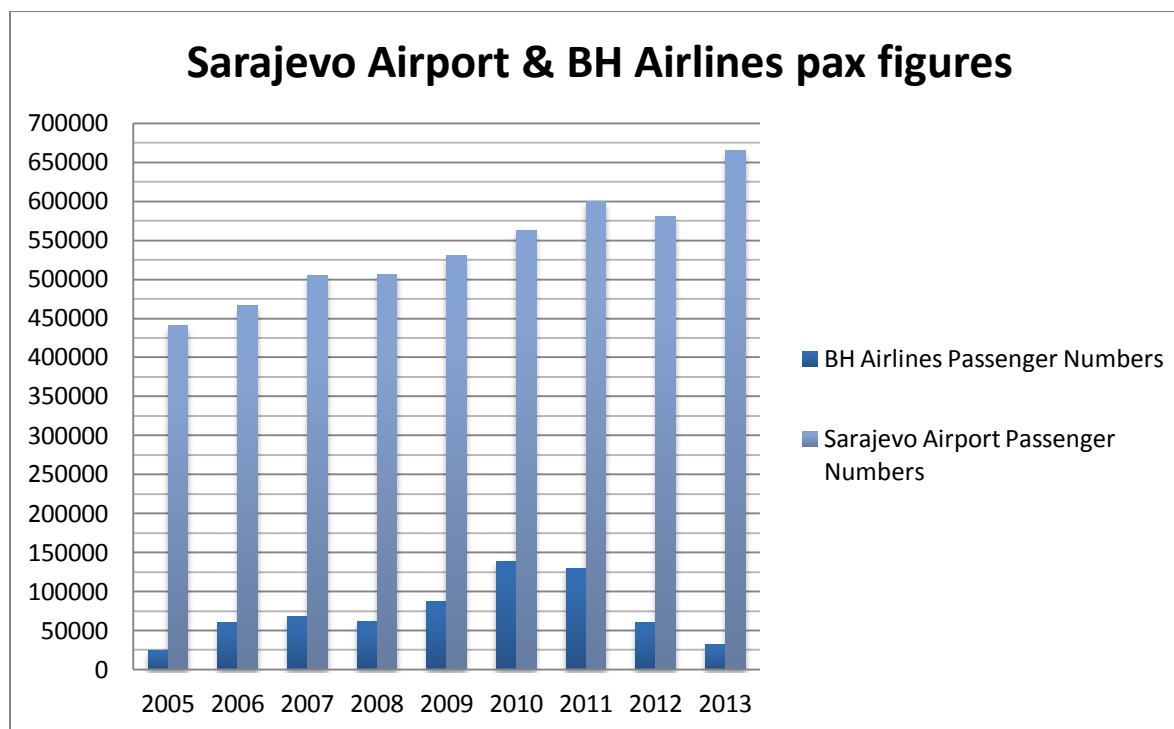


Figure 3. Passenger numbers for Sarajevo with flag carrier numbers included.

Today 10 airlines operate scheduled flights to Sarajevo, of which one is the flag carrier B&H Airlines. Table 2 provides an overview of the Top-10 Busiest carriers at the airport based on weekly seats available⁷. It therefore solely looks at the equipment used by different carriers as well as the frequency with which flights are operated. With this data an average amount of weekly seats available is computed. Load factor is ignored in this calculation for simplification reasons. The table is based on the Summer Timetable of **2014** and might therefore show a little discrepancy with last year. Only scheduled services are given, charters and seasonal flights are ignored. LCCs, Alliances and flag carriers are indicated as such.

The table shows that out of the airlines operating to Sarajevo on a scheduled basis, already more than one fifth of the seats is offered by LCCs. This is perhaps because of the low number of flights offered by the flag carrier, B&H Airlines, offering only about 8% of all the weekly seats available, which is an increase compared to the 4,8% market share it held in 2013. The Star Alliance is responsible for over 70% of the seats on offer, with about 10% of these seats being LCC seats coming from Lufthansa's daughter company Germanwings.

⁷ This number is calculated as follows: If, for instance, an airline operates a daily flight to a destination with a 150 seat aircraft, then the weekly seats available are equal to $(150 \times 7 \times 2) = 2100$. The multiplication by 2 accounts for arrival AND departure of the flight.

Table 2. Top 10 airlines operating to Sarajevo airport.

Airline	Destination(s)	# flights	Weekly seats	% of Total
Turkish Airlines ***	Istanbul	21	6930	30.40%
Austrian ***	Vienna	14	3864	16.95%
Pegasus **	Istanbul	7	2646	11.61%
Croatia Airlines ***	Zagreb	13	1976	8.67%
Lufthansa ***	Munich	7	1932	8.48%
B&H Airlines *	Belgrade,Copenhagen,Zurich	14	1848	8.11%
Germanwings **	Cologne, Stuttgart	5	1440	6.32%
Air Serbia	Belgrade	7	924	4.05%
Norwegian **	Stockholm	2	756	3.32%
Adria ***	Ljubljana	5	480	2.11%
* % Flag Carrier	8.11%	Total	22796	
** % LCC	21.24%			
*** % Star Alliance	66.61%			

Sarajevo airport experiences little domestic competition, although the arrival of WizzAir in Tuzla (Eastern Bosnia) is an interesting situation. It remains to be seen whether Wizz manages to take away passengers from Sarajevo airport or if this will just boost Bosnian aviation in general.

3.2 Croatia

In the early years of the new millennium, Croatia was the best performing country out of the ones specified in this research. Croatia is also the only country (apart from 12 miles in Bosnia) that has a coastline, and therefore a booming tourist industry. According to the Croatian Bureau of Statistics, the number of tourists has grown from 7.1 million in 2000 via 9.5 million in 2004 to 11.8 million tourists in 2012 (Perko et al. 2013.) Furthermore, Croatia is the first of these five countries to have joined the European Union, less than a year ago, on July 1st 2013.

3.2.2 Main Economic Indicators

The economic indicators also show a profile that places Croatia more towards the Western countries than the others mentioned here. Croatia's unemployment rate was around 17% in 2004, steadily decreasing over time as the world's economy was booming. By the year 2008

it had dropped to an all-time low of 13.1%. Since the global economic crisis has put off economic growth the number has started increasing again starting at 14.9% in 2009 and increasing by around 1.5% per year. In 2013, unemployment was around 20.3% of the working population.

As for GDP, the same pattern as observed in Bosnia can be adopted to describe the situation Croatia is in general. Up until 2008, GDP was growing by 5% on average on a yearly basis. The GDP per capita stood around \$14,000 in 2013, compared to Bosnia's \$4,500. After 2008 a steady decline can be seen in GDP growth. As mentioned, both USD and LCU GDP changes are shown for completeness and taking away external factors. This is provided for all countries.

GDP and passenger growth have a somewhat more refined relationship in Croatia, compared to Bosnia. Both variables move in the same direction, with crisis years 2008 and 2009 showing an almost 1 on 1 relation between the two as can be seen in figure 4.

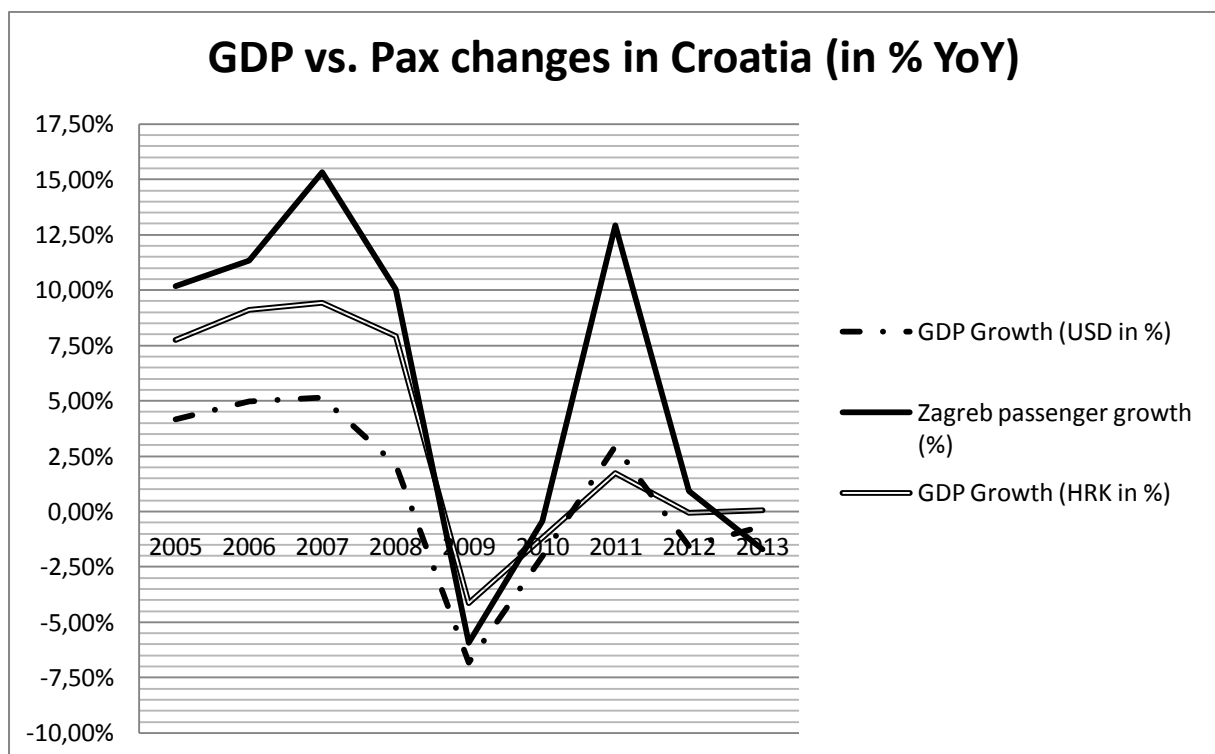


Figure 4. Relation between GDP growth and Passenger growth in Croatia

3.2.3 Croatian Diaspora

The Croatian diaspora is quite dispersed, not only within Europe but also across the rest of the world. The biggest groups⁸ outside Europe can be found in the USA (420,000) and Canada and Australia with both around 120,000 Croats. In Europe, German speaking countries are most popular with over 220,000 in Germany, 150,000 in Austria and some 40,000 in Switzerland. On a population of 4 million people, it is estimated that Croatia has a diaspora of between 1.4 and 2 million. The latter figure includes Croats in Latin America, most notably Chile and Argentina, who mostly fled or left Croatia during and after the Second World War. Figure 5 provides an overview of these statistics

Croatia relies much more on tourists than the other countries in the dataset. These people either arrive by car or bus (regional) or by plane. These passengers are less relevant for this analysis as it concerns Zagreb airport. Most tourists directly fly to one of the coastal airports such as Split, Dubrovnik or Pula. For Zagreb airport, diaspora again plays a bigger role. As almost all scheduled flights in Croatia operate through/via Zagreb, these people are more likely to visit the airport.

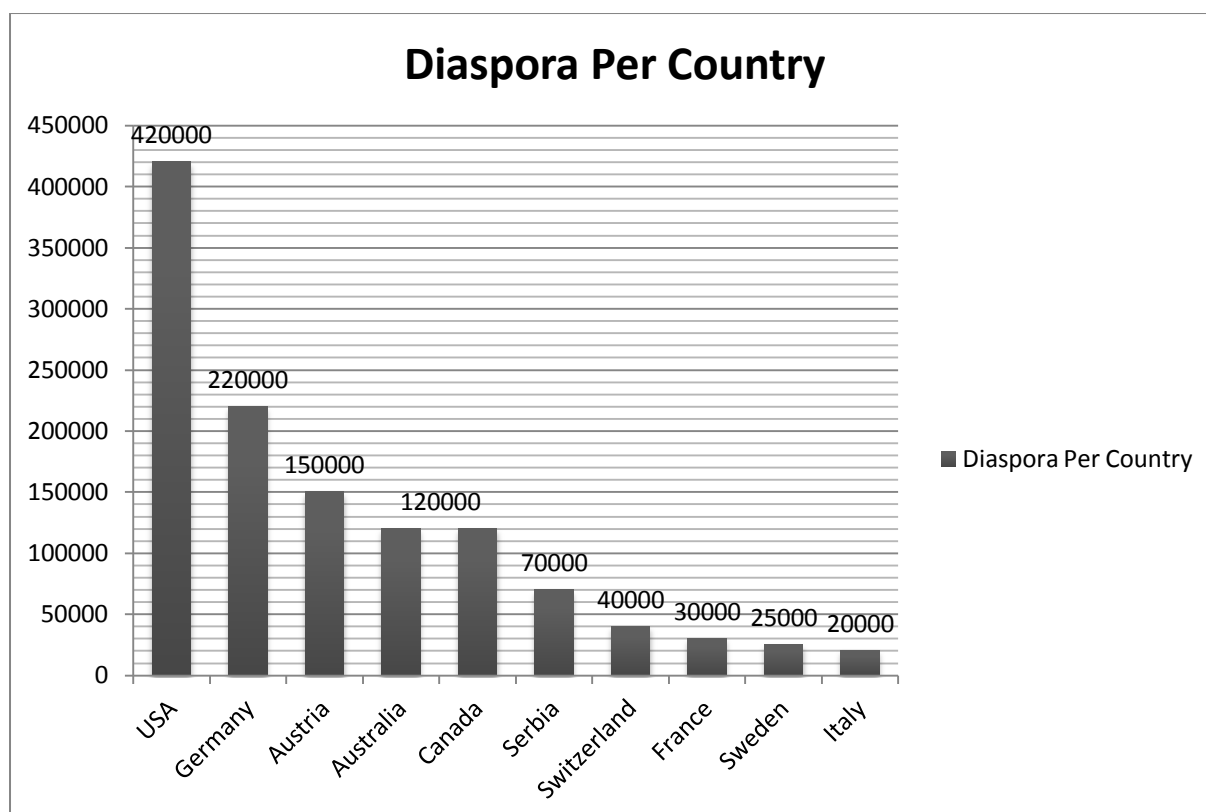


Figure 5. Croatian diaspora per country

⁸ These figures are based on official censuses of the respective countries ranging from 2005-2013.

3.2.4 Zagreb Airport

The three busiest routes from Zagreb airport are again in line with the (European) diaspora and transfer passenger market. Frankfurt, Vienna and Munich are the most frequently flown destinations from Zagreb airport. Zagreb is also home to Croatia Airlines, which has been around since the early 90's in its present form. Nowadays Croatia Airlines is a big customer at Zagreb airport, 9 out of the 10 busiest routes from Zagreb airport have at least 1 daily flight by Croatia Airlines. Something that has definitely helped Zagreb is that Croatia Airlines is an airline that operates according to the hub-spoke model. This has created some transfer passenger flows, mostly from Western Europe to other countries in former Yugoslavia with a short lay-over in Zagreb.

Zagreb's airport hasn't shown the strongest performance as can be seen in figure 6. It shows the number of passengers that passed through Zagreb airport ranging from 2004-2013. It immediately becomes clear that the crisis hit hard in Croatia. This could of course be a result of the crisis affecting other countries and people deciding to postpone or cancel holidays. The number of tourists in Croatia also dropped 3% in that year. This trend continued in 2010 and returned in 2013 when small declines in passenger numbers were recorded (-0.4% and -1.7% respectively.) Zagreb functions more as a transfer airport than as a big touristic one, so the effect of this might be minute. In the past 3 years, Zagreb's passenger numbers have been steady at around 2.3 million passengers a year.

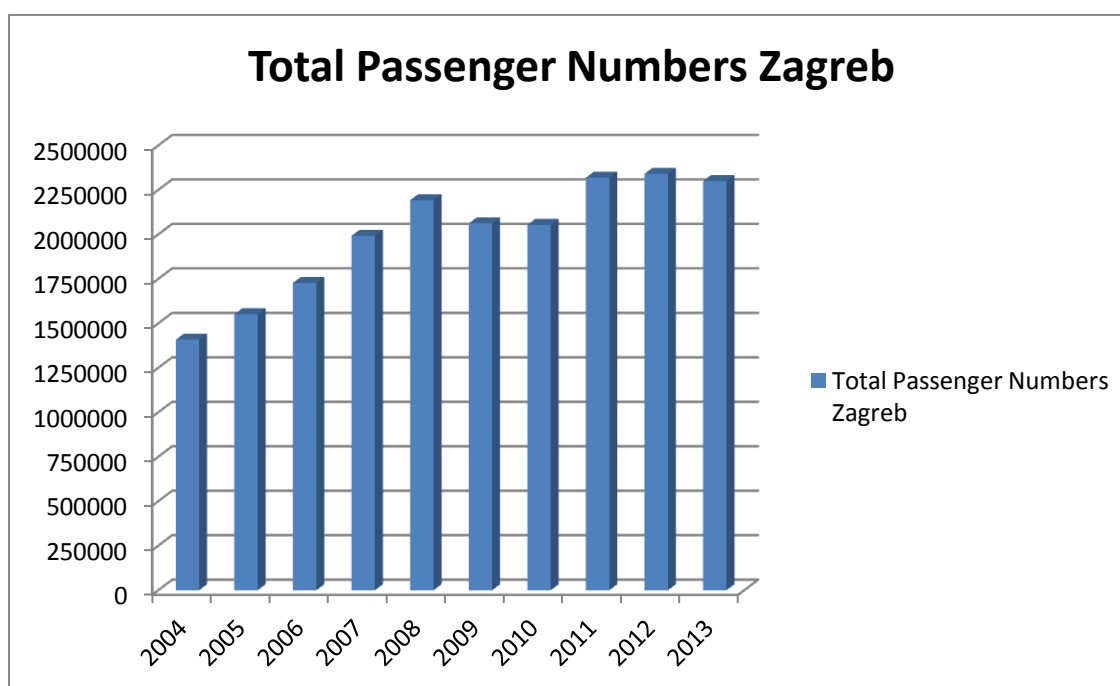


Figure 6. Passenger numbers for Zagreb

Today 16 airlines operate scheduled year-round flights to Zagreb, of which one is the flag carrier Croatia Airlines. Table 3 provides an overview of the Top-10 Busiest carriers at the airport based on weekly seats available. The table is based on the Summer Timetable of 2014 and might therefore show a little discrepancy with last year. Only scheduled services are given, charters and seasonal flights are ignored. The computation of weekly seats is identical to that of Sarajevo airport, ignoring load factor as well. For all countries that follow, the same logic is used. LCCs, Alliances and flag carriers are indicated as such. The table shows that Zagreb airport has a relatively small component of weekly seats on offer by LCCs in the Top-10. Only 6.34% is offered by such companies, with the flag carrier Croatia Airlines, also part of the Star Alliance offering almost a tenfold increase of that number as part of the Top-10, with 62.04% of the seats coming from this company.

Table 3. Top 10 airlines operating to Zagreb airport.

Airline	Destination(s)	# flights	Weekly seats	% of Total
Croatia Airlines */ ***	a.o Vienna, Frankfurt, Rome,	197	42946	62.04%
Lufthansa ***	Berlin, Munich	24	6624	9.57%
Turkish Airlines ***	Istanbul	14	4620	6.67%
Germanwings **	Cologne, Stuttgart	12	3456	4.99%
Austrian ***	Vienna	19	3420	4.94%
Air France	Paris	7	2016	2.91%
British Airways	London-Heathrow	7	1848	2.67%
Aeroflot	Moscow	7	1960	2.83%
KLM	Amsterdam	7	1400	2.02%
Easyjet **	London-Gatwick	3	936	1.35%
* % Flag Carrier	62.04%	Total	69226	
** % LCC	6.34%			
*** % Star Alliance	88.21%			

One thing specific for Zagreb airport is that it has been struggling to find investors to expand its terminal. Attempts have been made since 2008, but only last year did a French consortium receive the concession. Construction has not even begun yet and plans have already been altered several times. Despite being a transfer airport, Zagreb does not even have jet bridges,

which often results in the nickname of ‘high tech bus station.’ Another thing that has caused trouble is the financial performance of Croatia Airlines. The airline has been forced to cut down on almost everything ranging from staff to catering to frequencies of flights. These financial losses have also led to an unhappy work force which has resulted into Zagreb being the stage of a series of strikes over the past few years. This not being good for the reputation of Croatia Airlines indirectly impacts Zagreb airport as well.

3.3 Kosovo

Kosovo is the youngest of these countries. Although there were wars about the ground in 1999 which led to serious bombing of Serbia by NATO forces, the country declared independency on February 17th 2008. Only around half of all the countries recognize Kosovo as a sovereign state, but here it will be treated as such when necessary.

3.3.1 Main Economic Indicators

Kosovo is the smallest country both in terms of area as well as population in this dataset. Back in 2000, more than 50% of the total population was registered as being unemployed. This number decreased to 40% in 2004 but then started climbing again to around 47.5% in 2008. Luckily, the percentage of unemployed people seems to be dropping on a yearly basis since then. In 2010, the rate stood at 45% with a huge drop to around 31% in 2012. As mentioned earlier, both the percentage as well as the sudden shocks in the rates could have something to do with the size of the informal (both grey and black) economy in the countries in former Yugoslavia.

Kosovo seems to be one of the few countries that did relatively well during the crisis in terms of GDP. As figure 7 shows, GDP growth has only shown positive numbers since 2004, even during the economic downturn. What is noticeable however is that the years after the global crisis hit show a lower growth rate than the years before. 2007 and 2008 saw growth of 8.3% and 7.2% respectively, whereas 2009 and 2010 took a hit and stopped at 3.0% and 3.2%. GDP per capita slightly fell back in 2009, by 100 US\$.⁹ In general developments seem a little special in Kosovo, as GDP growth remains positive, quite a unique feature especially during crisis years.

⁹ <http://www.invest-ks.org/en/News/-82> (last accessed September 16th)

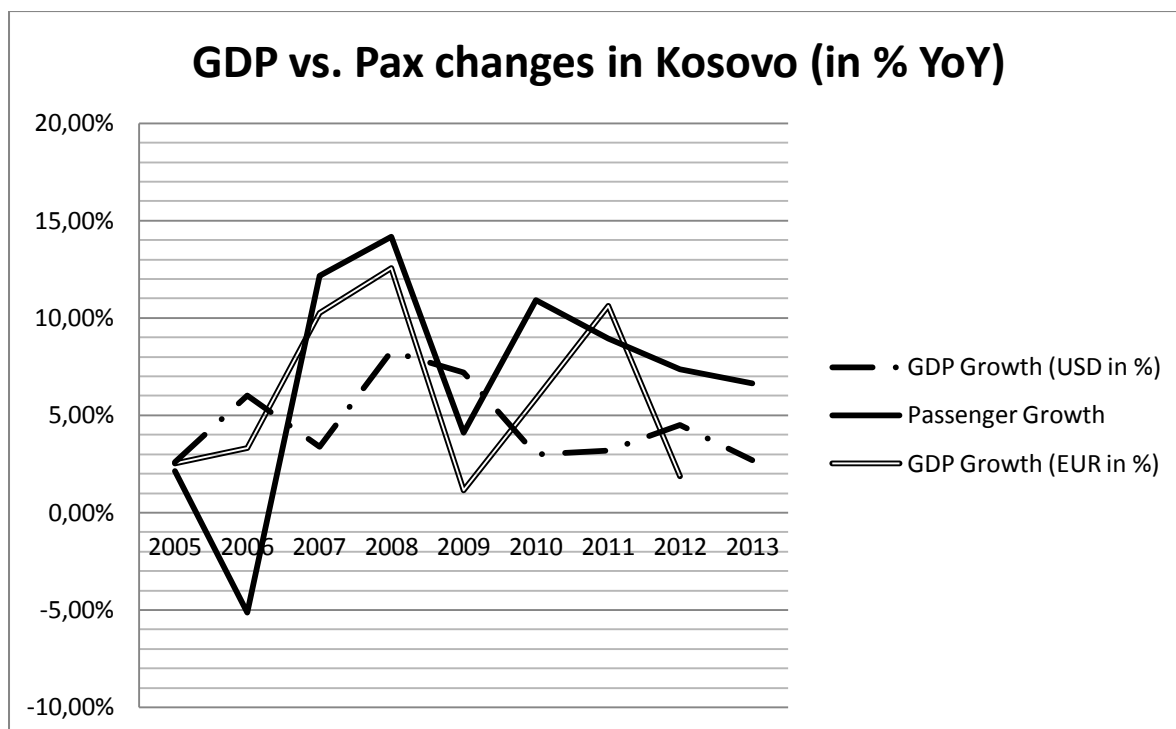


Figure 7. Relation between GDP growth and Passenger growth in Kosovo

3.3.2 Kosovar Diaspora

The country nowadays has the lowest GDP per capita in this dataset, but whether this impacts aviation remains to be seen, as Kosovo is estimated to have a diaspora of at least 800,000 people. As there is no official registration method this number remains an estimate. Looking at the "Kosovan Migration" report by the Kosovar Bureau of Statistics (Kastrati, 2014) and taking this diaspora size of around 800,000 into consideration the division can be made as seen in figure 8. Almost 60% of the diaspora is to be found in either Germany or Switzerland. Germany being home to more than 280,000 Kosovars followed by Switzerland with around 180,000. Other notable diaspora sizes are found in Italy, Austria, Sweden and the USA among others. One must note that this report does nothing with possible Kosovar diaspora in other countries in Former Yugoslavia such as Albania and Macedonia. Whether these people call themselves Albanian Kosovars or Albanians might also be an important factor upon deciding where to place them.

With a population of around 1.8 million in Kosovo itself, this means that about 45% could be added to the domestic population, or 33% of the Kosovars live abroad.

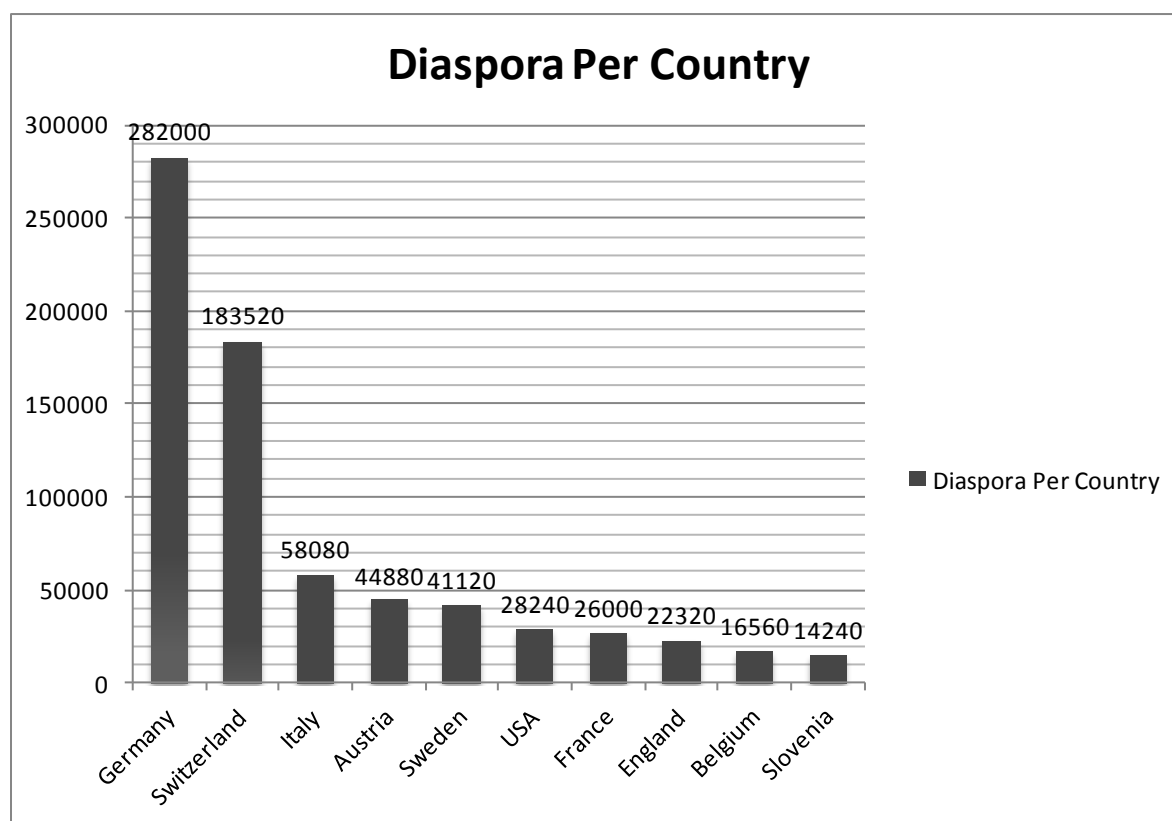


Figure 8. Kosovar diaspora per country

3.3.3 Pristina Airport

In 2013, 1.6 million passengers passed through the airport, which is almost 90% of the entire population. Kosovo was (is) quite restricted when it comes to travel for example. Kosovar passports take a long time to pass the Serbian border if they are cleared at all. Pristina airport seems to have benefited greatly from this. Travelling by air could therefore be a much more considered option than in other countries. Out of these 1.6 million passengers, almost 35% of these had an origin or destination in Switzerland (Zurich, Basel and Geneva.) Another 33% comes from destinations in Germany, with the main airports being Dusseldorf, Munich and Stuttgart. It also stands out that Scandinavia and the US are not or barely represented. This is partly because there are no or few direct flights to these places, whereas in the calculations the last airport before arrival or the first airport after departure is taken into consideration. Therefore, someone arriving from Chicago, who had a transfer in Munich, is registered as a passenger from Munich.

Pristina airport is not home to a national carrier anymore, although it has been from 2009 up until the final months of 2013 when Belle Air Europe went bankrupt. This was more or less a hybrid model, as it operated with the intention of being some sort of flag carrier, but the concept was completely low-cost and the airline also operated some flights out of Skopje

airport. Currently the airport is served by 13 airlines year round of which 7 are Star Alliance members and 4 are LCCs. Norwegian is a fifth LCC that operates summer seasonal flights to Scandinavia. As there is no flag carrier but there have been changes in presence of LCCs among others, table 4 shows the top-10 of airlines operating to Pristina. The table is based on the Summer Timetable of 2014 and might therefore show a little discrepancy with last year, as this 2014 is the first year without flag carrier/ LCC Belle Air after its demise. Only scheduled services are given, charters and seasonal flights are ignored. LCCs, Alliances and flag carriers are indicated as such.

When Belle Air was still operating flights as flag carrier of Kosovo and LCC. It had a market share of some 17% and after the airline went bankrupt this void has mostly been filled by Full Service Carriers, mostly Turkish Airlines. It approximately doubled its market share from 8% to 17%. Adria Airways from Slovenia increased its market share from some 9% to offering over 15% of all weekly seats available at Pristina. On the other hand, LCC Pegasus upped its market share from 5 to 11%, as Istanbul becomes more of a transfer-hub. This seems to have hit German airlines especially, with Germania and Germanwings experiencing declining market shares.

In 2013, Adria has attempted to set up a base in Pristina as well. A last point is that flag carriers or full service carriers are not necessarily suffering from this. Even though Austrian saw its market share slashed in half, Turkish Airlines which has been expanding rapidly lately has managed to up its market share. With the now defunct flag carrier Belle Air, Adria has tried to step in and fill the void with flights to popular destinations apart from Switzerland. Turkish and Austrian also hold a large market share.

Table 4. Top 10 airlines operating to Pristina

Airline	Destination(s)	# flights	Weekly seats	% of Total
Turkish Airlines ***	Istanbul	14	3528	17.89%
Adria ***	Frankfurt, Ljubljana, Munich	16	3104	15.74%
Austrian ***	Vienna	12	2400	12.17%
Edelweiss	Zurich	7	2352	11.93%
Pegasus **	Istanbul	6	2268	11.50%
Easyjet Suisse **	Basle, Geneva	7	2184	11.08%
Germanwings **	Dusseldorf, Stuttgart	5	1440	7.30%
Belair	Zurich	4	1200	6.09%
Germania	London-Gatwick	2	640	3.25%
JetairFly **	Brussels	2	600	3.04%
* % Flag Carrier	0.00%	Total	19716	
** % LCC	32.93%			
*** % Star Alliance	45.81%			

Out of the top-10 of airlines operating to Pristina, still 33% of the seats offered comes from LCCs. The Star Alliance is yet again a big player, with 46% of the seats on offer by the top-10 coming from a *Alliance carrier. Compared to this year, LCCs lost more than 10% of their market share on the whole, and 7% in the top-10. Looking at the numbers, the Star Alliance has managed to take most of these lost numbers with Austrian and Turkish increasing their frequencies.

3.4 Macedonia (F.Y.R.O.M.)

Only the 1999 Kosovo war had a serious impact on Macedonia as hundreds of thousands ethnic Albanians fled Kosovo during this conflict. This is also reflected in the aviation numbers as Skopje airport handled more than a million passengers in 2000 because of these streams of refugees not being able to use another mode of transport or airport. 2000 still remains the record year for Skopje airport, although 2014 will most certainly surpass this number.

3.4.1 Main Economic Indicators

With around 2 million inhabitants, Macedonia's unemployment rate stood at 37% in 2004. It is the only country that has shown a constantly decreasing trend, even during 2009 and 2010. By 2012 unemployment had dropped to 31% of the population. Only the bigger brothers Croatia and Serbia can provide data on lower rates of unemployment.

As for GDP growth, it seems that Macedonia is suffering from the same symptoms as for instance Bosnia, the double dip. GDP was growing at around 5% on a yearly basis from 2004 onwards with a dip in 2009 of -1%. The following years saw a growth of just under 3%, but 2012 was ended with a decrease of a quarter of a percent. Growth in Macedonian Denars was slightly bigger, but both show a pattern somewhat similar to passenger growth at Skopje Airport as shown in figure 9.

Despite the somewhat indifferent GDP performance, Skopje airport was part of a concession given to TAV (Tepe Akfen Ventures, a large airport operating company from Turkey that operates 12 airports in the region) in 2008. TAV took over formal control in the beginning of 2010 and soon the construction of a new terminal was well underway.

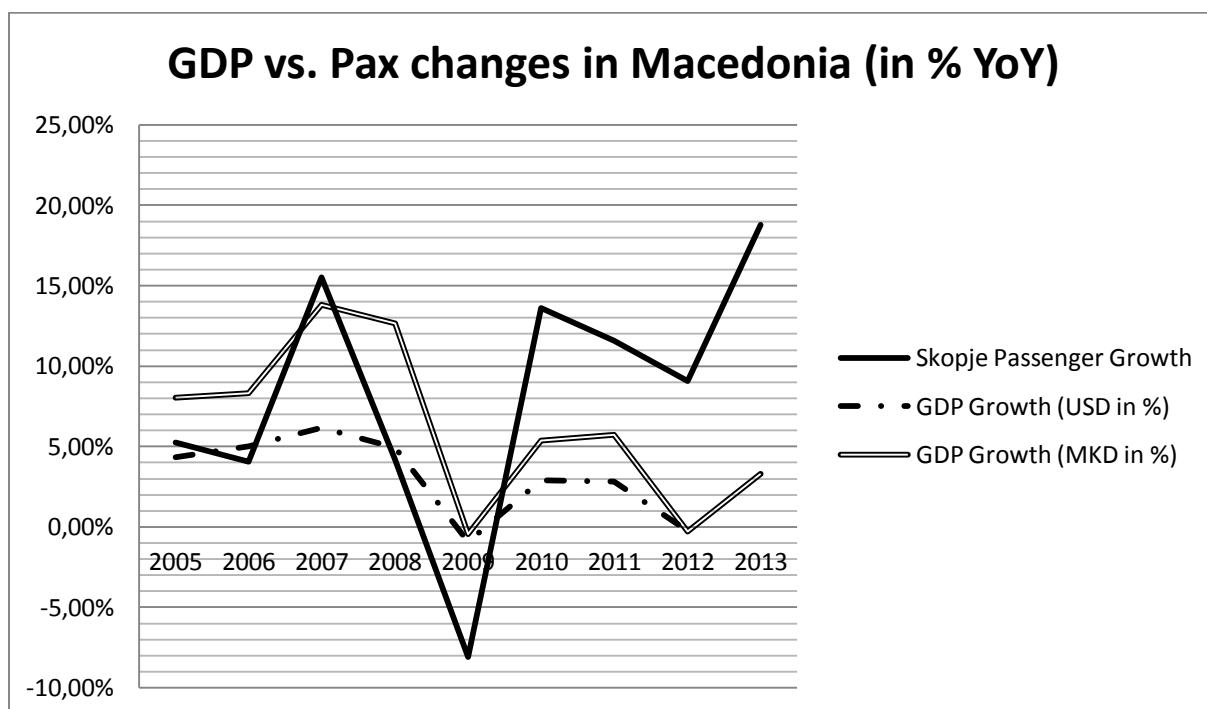


Figure 9. Relation between GDP growth and Passenger growth in Macedonia

3.4.2 Macedonian Diaspora

Macedonia has a slightly smaller diaspora size than the countries mentioned so far, with numbers reaching approximately 500.000 to 600.000 people. The largest concentrations can

be found, and this will reflect the previous countries, in Germany, USA, Australia, Canada, Switzerland, Italy, but also Serbia. The countries overseas: USA, Canada and Australia together hold some 170.000 Macedonians, whereas the largest concentrations in Europe are to be found in Italy, Germany and Switzerland. Figure 10 gives an overview of the size of the diaspora in the aforementioned countries that have the biggest share of them.

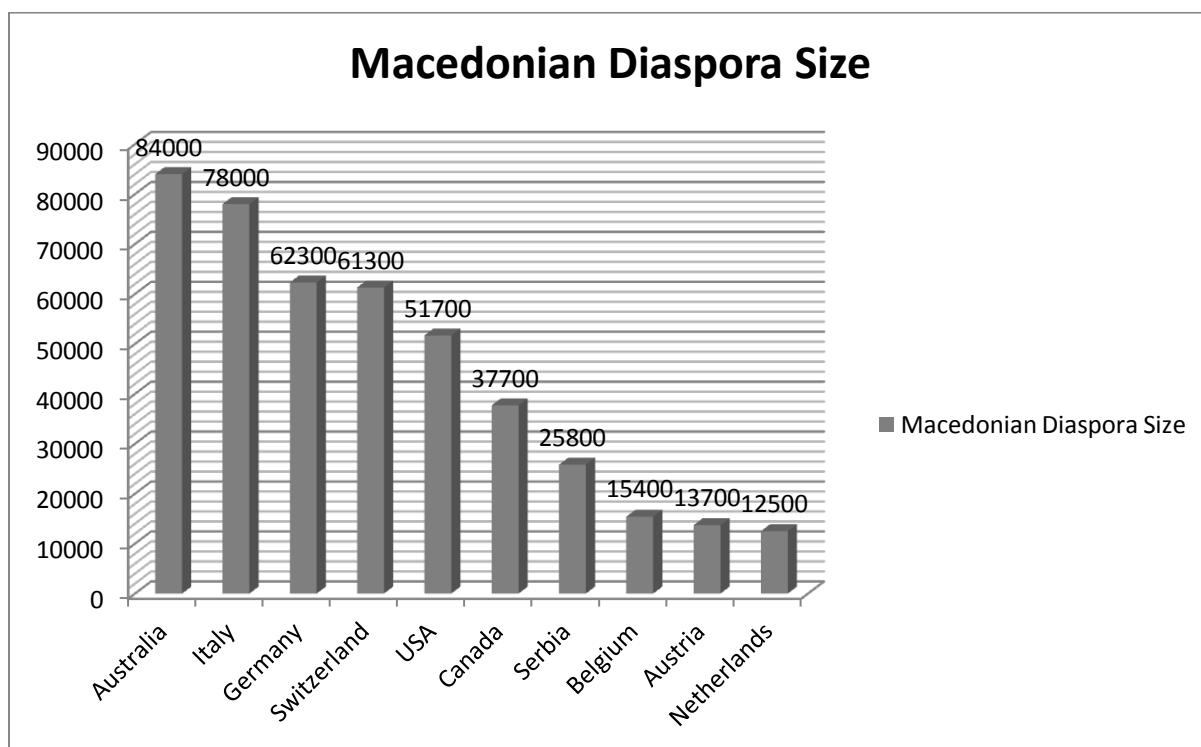


Figure 10. Macedonian diaspora per country

3.4.3 Skopje Airport

It is no surprise when looking at the Skopje airport figures to see that four airlines operate flights to Switzerland, six German destinations are covered by two airlines and Air Serbia has two daily flights to Belgrade. Only Italy seems underserved, having only an Alitalia flight to Rome and LCC flights to Venice and Milan (Treviso and Bergamo.) 12 airlines operate flights to Skopje airport nowadays. Wizz Air has the biggest presence and even based two aircraft in Skopje.¹⁰ It is no secret that the Macedonian government has a long-term contract with Wizz Air about subsidies for flying from Macedonia.

The new terminal and/or the new owner of the airport has managed to express its presence in numbers as well. TAV started operating the airport effectively in 2010. When looking at the passenger growth in the years up to 2013 Skopje managed to record an impressive average

¹⁰ http://wizzair.com/en-GB/about_us/news/wizen232 (Last accessed August 31st)

yearly growth of just over 13%. The airport handled 984.407 passengers in 2013, just some 35.000 passengers short of its record year 2000. This was mostly due to airport closure in December because of very heavy and persistent fog.

Macedonia does not have a flag carrier. MAT Airways used to operate flights but did so on a very irregular basis in its last years. Despite the demise of MAT, being able to attract a new terminal operator, constructing a new terminal and having secured the presence of Wizz Air has made Skopje airport a big player in the region.

As there is no flag carrier but there have been changes in presence of LCCs among others, table 5 shows the top-10 of airlines operating to Pristina. The table is based on the Summer Timetable of 2014 and might therefore show a little discrepancy with last year. Only scheduled services are given, charters and seasonal flights are ignored. LCCs, Alliances and flag carriers are indicated as such. What immediately stands out is that Wizz Air, as an LCC, offers the most seats per week out of Skopje with a market share of over 40% in the Top-10. As only two more airlines operate scheduled services to Skopje this number is not likely to change much. The total share of LCC-seats lies around 55-60%.

Table 5. Top 10 airlines operating to Skopje

Airline	Destination(s)	# flights	Weekly seats	% of Total
Wizz Air **	a.o. Basle, Dortmund, Malmo	37	13320	40.59%
Turkish Airlines ***	Istanbul	14	4284	13.06%
Austrian ***	Vienna	12	2928	8.92%
Air Serbia	Belgrade	14	2800	8.53%
Pegasus **	Istanbul	5	1890	5.76%
Adria ***	Ljubljana	10	1800	5.49%
Croatia Airlines ***	Zagreb	8	1776	5.41%
FlyDubai **	Dubai	4	1440	4.39%
Edelweiss	Zurich	4	1344	4.10%
Alitalia	Rome	7	1232	3.75%
* % Flag Carrier	0.00%	Total	32814	
** % LCC	50.74%			
*** % Star Alliance	32.88%			

When taking the numbers of 2013 into consideration we see that this estimation is pretty accurate. The total number of passengers that passed through Skopje airport using an LCC¹¹ in 2013 accumulate to 44.7% of the total passenger amount in 2013. Wizz Air took responsibility for 36.4% of the passengers. It must be noted that since 2013, all LCCs airlines have increased their frequencies, possibly explaining the (slight) number differences. In total, over 440 thousand passengers of a total 984 thousand used an LCC to reach or depart from Skopje airport.

3.5 Serbia

Serbia was the dominant party/force during the Yugoslav war and wasn't affected as much as the other countries as most of the conflict took part on territory of the newly formed nations. It did however had to suffer sanctions imposed by the European Union, US and UN. To bring the Kosovo conflict of 1999 to a halt, NATO forces heavily bombarded the capital Belgrade and Serbia was tied to sanctions again.

3.5.1 Main Economic Indicators

Serbia does have a somewhat acceptable unemployment rate for the region. Standing at 20,8% in 2005, it dropped to a mere 13,6% in 2008 after which, as in many countries, the recession started. From 2010 to 2012 the rate seems to have stabilized somewhat and now stands at around 19,5%, only 3,7% higher than Croatia.

Serbia started out as the country with the lowest GDP per capita when looking back at 2000. Slowly but steadily, it has climbed up to take the number two spot, behind Croatia. The double dip pattern is also clearly visible in this case, although it must be noted that in LCUs (Local Currency Units) the growth was never a negative one. Because the exchange rate RSD/USD is not a fixed one, the percentages on the USD side show some more extreme values, albeit following the same pattern. Strong decreases in 2008 and 2012 are counteracted by large increases in the years following. Figure 11 illustrates the percentual changes of GDP compared to passenger growth at Belgrade Airport.

¹¹ xyuaviation.blogspot.nl/2014/09/macedonias-low-cost-boom-coming-to-end.html (Last accessed September 20th)

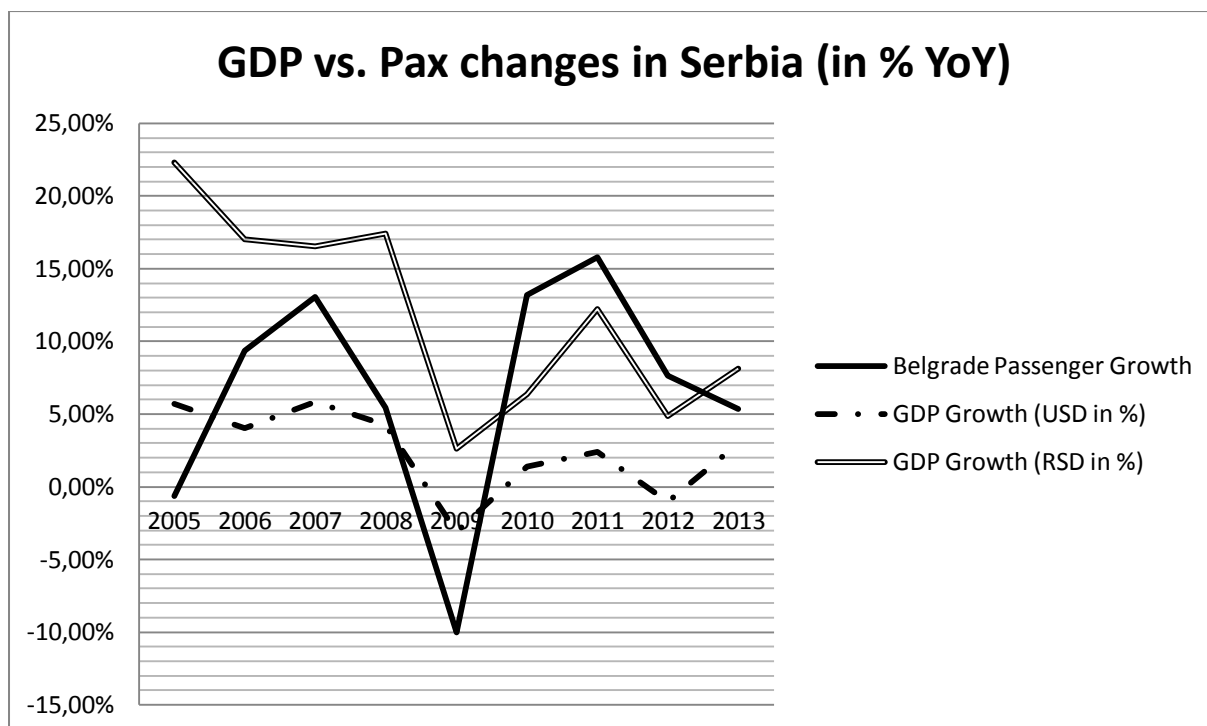


Figure 11. Relation between GDP growth and Passenger growth in Serbia

3.5.2 Serbian Diaspora

Serbia has quite an extensive diaspora all over the world. Serbia itself is estimated to have some 7.3 million people living there, but the total number of Serbs is closer to 11.4 million. This implies a diaspora size of 4.1 million or 35,9 percent of the total number. A diaspora platform Serbian Unity has, together with the ministries of Diaspora and Foreign affairs, estimated the division of the Serbian diaspora among the world's countries. It is estimated that 1.8 million Serbs live in the territories of Former Yugoslavia outside of Serbia. Another big concentration is found in the USA (between 200.000 and 400.000) and around a 100.000 Serbs live in Canada. The same number can be found in Australia, whereas the division in seems to be consistent with the other countries. Germany houses 700.000 Serbs, Austria (350.000) and Switzerland (186.000) follow at a noticeable distance. Besides the German speaking countries, France (120.000), Sweden (110.000) The UK (70.000) and the Benelux (70.000) hold some large concentrations. This is illustrated by Figure 12. Another 200.000 are divided among other countries with very small communities in Africa, Asia and Latin America.



Figure 12. Serbian diaspora per country

3.5.3 Belgrade Airport

Belgrade airport is, just like Zagreb, a transfer airport. After the war, the fleet of the Jugoslovenski Aerotransport (JAT) remained in Belgrade, Serbia and thus there was some sort of advantage from the beginning. Figure 13 shows the total yearly passenger numbers for Belgrade airport as well as the share JAT Airways had in those numbers. 2013 data is not available for JAT as 2013 was a special year. November 1st marked the transition into Air Serbia, after being purchased (49%) by Etihad Airways which attempts to restructure the carrier by modernizing its fleet and expanding its network. In the first months of Air Serbia in 2014 it has managed to up its passenger numbers by some 40%.

The passenger numbers are increasing almost all the time, except for another drop in 2009. When it comes to passenger share of JAT figure 13 shows that this has been a declining trend since 2006. At its peak in 2004, JAT was responsible for just over 52% of all passengers at Belgrade airport. At its low in 2010 this figure had dropped to 36,74% after which it recovered somewhat to stand at 38,28% in 2012. It remains to be seen what the changes will be in the coming year as there is a strong presence of LCCs nowadays but also JAT has been rebranded as mentioned earlier.

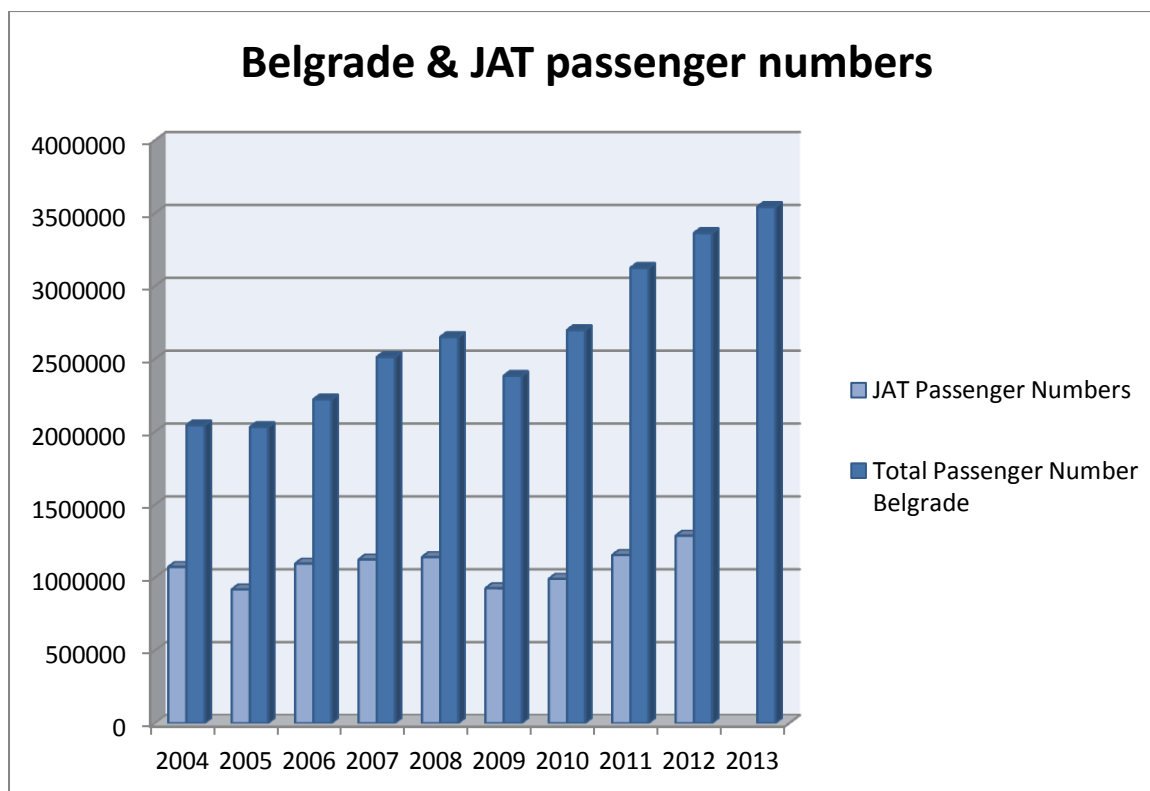


Figure 13. Belgrade and JAT passenger numbers (2004-2013)

On a year-round basis, Belgrade is served by 25 airlines. One flag carrier: Air Serbia, seven low-cost airlines with 17 destinations among them, and 17 carriers from different alliances, in which the Star Alliance is again dominant, with seven representatives. The biggest carrier serving this airport after Air Serbia is Wizz Air, although it has said it will remove one of the two aircraft from its Belgrade base after airport handling fees were increased.¹² Wizz Air was responsible for some 480.000 passengers at Belgrade airport in 2013, which represents a 13,5% market share. These figures imply that JAT and Wizz Air together took care of more than half of the 3.5 million passengers that passed through the airport in 2013. In the first 10 months of 2013, JAT transported 1.173.356 passengers. Table 6 provides an overview of the Top-10 Busiest carriers at the airport based on weekly seats available. The table is based on the Summer Timetable of 2014 and might therefore show a little discrepancy with last year. Only scheduled services are given, charters and seasonal flights are ignored. LCCs, Alliances and flag carriers are indicated as such.

¹² http://wizzair.com/en-GB/about_us/news/wizen239 (last accessed June 12th)

Table 6. Top 10 airlines operating to Pristina

Airline	Destination(s)	# flights	Weekly seats	% of Total
Air Serbia *	Balkans, W- and E-Europe	316	74576	61.31%
Wizz Air **	France, Germany, Scandinavia	29	10440	8.58%
Lufthansa ***	Frankfurt, Munich	28	7560	6.22%
Montenegro Air	Podgorica, Tivat	28	6104	5.02%
Swiss ***	Geneva, Zurich	17	4624	3.80%
Austrian ***	Vienna	22	4400	3.62%
Aeroflot	Moscow	14	4340	3.57%
Turkish Airlines ***	Istanbul	14	4144	3.41%
Easyjet **	Geneva, Milan, Rome	10	3120	2.56%
Alitalia	Rome	11	2332	1.92%
* % Flag Carrier	61.31%	Total	121640	
** % LCC	11.15%			
*** % Star Alliance	17.04%			

What clearly stands out is the large part that the flag carrier Air Serbia takes out of the top-10. Out of the 7 LCCs serving Belgrade, only 2 make it into the top-10 looking at weekly seats offered. It must be noted that this situation might not perfectly represent all the years of this research, as JAT Airways (the predecessor of Air Serbia) was not the most stable carrier considering operations and fleet availability.

Note: One cause for passenger growth can definitely be found outside economic impact. Air Serbia, recently acquired by Etihad, has significantly increased its flights after the takeover was completed. Belgrade airport has welcomed over 30% more passengers in the first eight months of 2014 compared to the same period last year.¹³

3.6 Comparisons within the region

After analyzing the countries and providing information on their respective values for different variables I now provide a first comparison. This comparison is solely based on the information gathered in this chapter.

¹³ http://beg.aero/o_nama/statistika/statistika.888.html (last accessed September 25th)

3.6.1 Regional comparison: variables

The information gathered in this chapter allows for a first comparison between the 5 airport/cities/countries. GDP per capita is discussed in this chapter and figure 14 provides an overview of this figure for all five countries. All values are expressed in current USD to allow for better comparison.

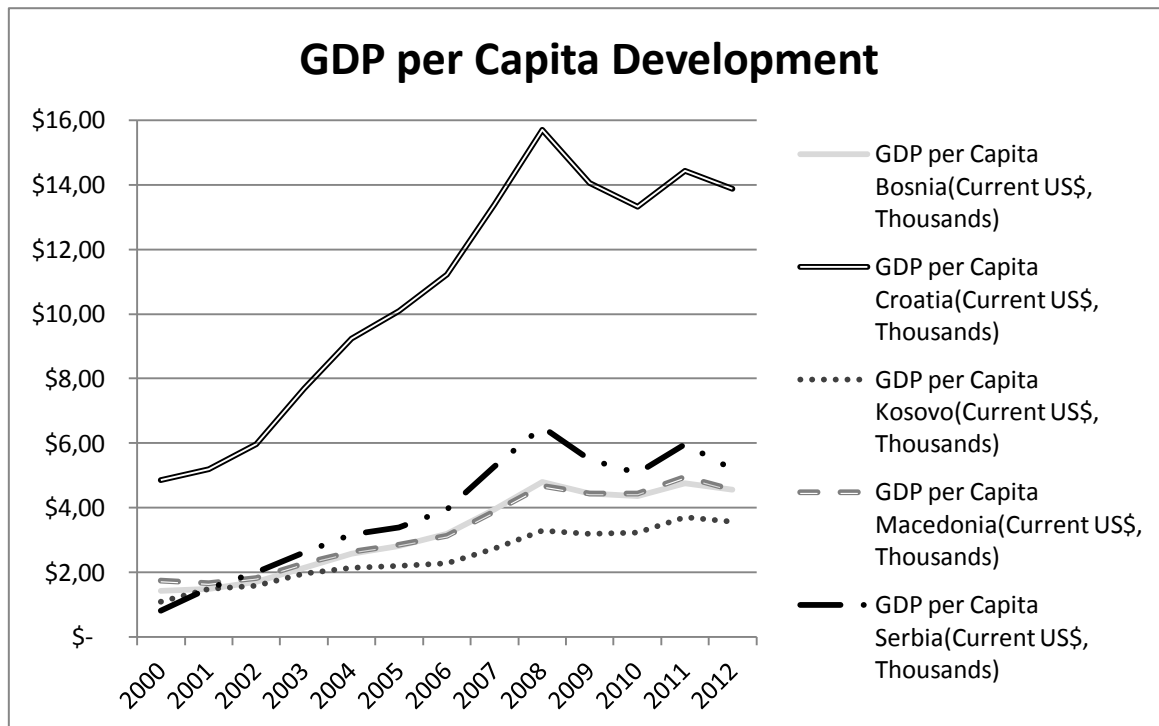


Figure 14. Development of GDP per Capita throughout dataset

A few things immediately stand out looking at this graph with Croatia being the leader over the full time span. With a current GDP per capita of around 14 thousand USD its GDP is almost three times that of Serbia and has an even bigger factor compared to the other countries. The other four countries have values close to each other, between 3,500 USD and 5,500 USD in 2012. Kosovo is trailing currently, with Bosnia and Macedonia approximately showing the same pattern over the years.

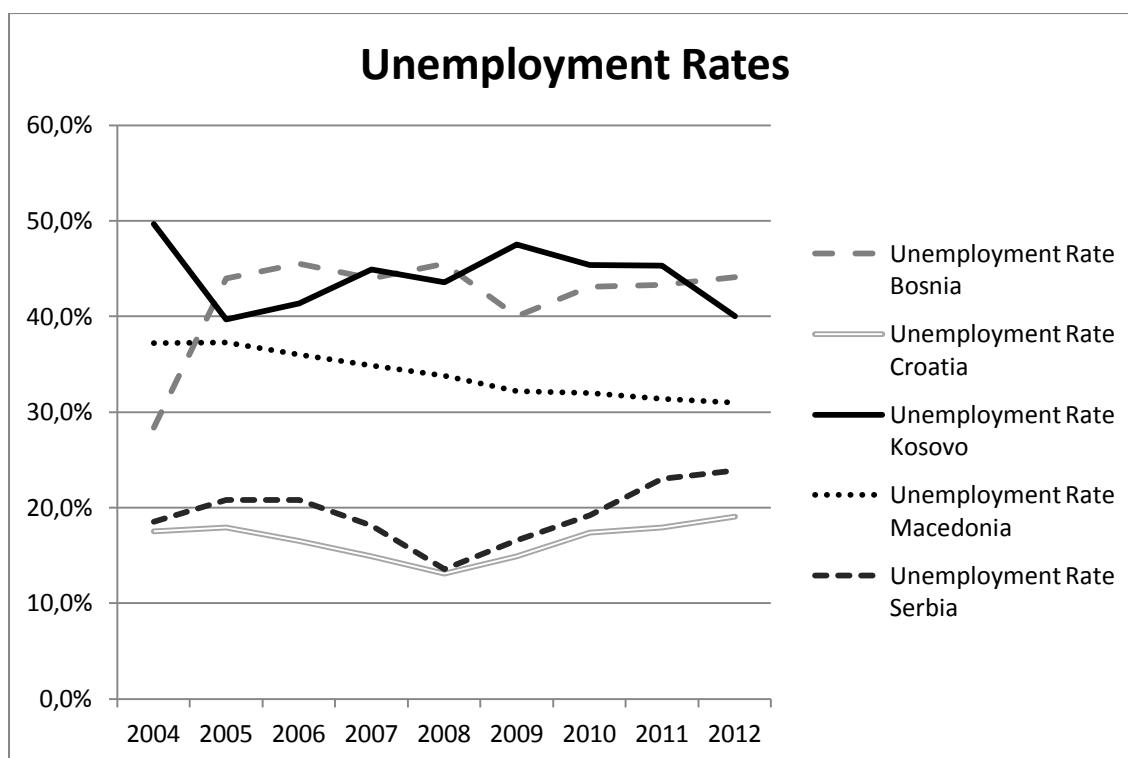


Figure 15. Unemployment Rate Development throughout dataset

Knowing how GDP per capita has developed, the comparison of unemployment rates (figure 15) provides information to put the former into more perspective. An obvious point is that Croatia and Serbia are again number 1 and 2 respectively. Both have (mostly) managed to keep their unemployment rate under 20% which is, in this area, to be considered quite good, especially when compared to the other countries mentioned here. The other three countries are fighting a battle of their own with official statistics suggesting that Kosovo has developed the most, dropping from 50% unemployment to around 30%. The significant drop in 2011/2012 is yet to be examined though. Macedonia has remained fairly constant over the years between 30 and 40%, Bosnia is the worst performer with rates increasing over time from around 25% in 2000, up to 44% in 2012. The validity of these numbers remains to be seen, because of the large scale grey/black economy in the respective countries, as mentioned earlier.

As users of these airports frequently are part of the country's diaspora this has been taken into consideration. Diaspora sizes vary from around 400 thousand from Macedonia to some 4 million from Serbia. These numbers are for the 10 countries that hold the most people from the respective former Yugoslav country. For Serbia, close to two million people still live in the former Yugoslav region and are therefore not expected to be a big part of the air transport market.

In general, the most popular diaspora countries seem to be Germany, Austria, Switzerland, the Scandinavian countries and the USA. Especially the latter requires air transport, the others often have strong air links with the region. Croatia and Serbia have more flights to Germany and Austria compared to the other countries. Airport performance and statistics are further explained in the following chapter.

3.6.2 Regional comparison: literature

Apart from differences in figures, there are also differences that can be identified based on the literature: The development of ever increasing low cost flights, both numeric and relative does seem to continue over time. Chi and Baek (2013) discuss the effect of (economic) shocks on aviation. Assuming that the global financial crisis also counts as a major shock it is worthwhile to take a look and see how LCCs performed in this case. Wizz Air, the carrier that is most active in the region of Former Yugoslavia, has not seen a drop in passenger numbers during the years of the financial crisis.¹⁴ The Centre for Aviation in cooperation with Wizz Air show that the passenger numbers of the airline have been steadily increasing from 2005 onwards. There are some indications that the crisis might also have affected LCCs as there was a slight drop in load factor (LF)¹⁵ and the fact that 2009 showed an increased net loss inconsistent with the trend that showed before.

Whether LCCs shock the market they enter depends on multiple factors. Francis et al. (2006) argue that it is more about LCCs seemingly being able to resist the shocks and continue growing despite shocks occurring. Francis et al. (2006) further add that Eastern Europe is a region that can see big changes because of LCC travel as they have a lot of capacity left over and the tourism potential is big because of low prices within the country and the travel to the country as well. It remains to be seen whether the effect of LCCs is present in the way described by literature.

If we look at other shocks than LCC entrances in the region of Former Yugoslavia certain shocks could be identified. The proclamation of independence by Kosovo in 2008 is one example which could have caused a shift in passenger numbers. Apart from these shocks, there is of course the general seasonality which can be more common in countries where the diaspora market is larger, such as Kosovo, Macedonia and Bosnia.

¹⁴ <http://centreforaviation.com/analysis/wizz-air-why-europes-second-lowest-cost-producer-may-be-looking-for-fresh-capital-103429> (last accessed July 8th)

¹⁵ *Load Factor is a term that describes the number of occupied seats in an aircraft as a percentage of total seats on offer on that plane.*

Ishutkina (2009) gave the argument that the availability of other transport modes also plays a role in the development of the aviation sector. Several examples from the region are provided. It is to be noted that these examples show that the availability of other transport modes or restrictions that come with it result in different effects in this region. As it was clear that it would be extremely difficult to assess to what extent the availability of other transport modes influences the development of aviation within this research, it is left out.

This chapter provided an overview of the key economic indicators of all five countries in this research. It also gave information on airport infrastructure and therefore made a first, basic connection between all indicators. The next chapter elaborates on the data, taking the information above as a starting point.

Chapter 4. Model and Data

Data should always be collected and analyzed carefully. Therefore, the data collected for this research is mostly taken from the official offices responsible for collecting passenger data in the respective countries. Data collection was split into several sections. At first it was key to collect data on all airports considering monthly passenger statistics. From Chapter 2 the independent variables were identified.

4.1 Data Selection

This section provides information on how the data in this research was obtained and on how the data is used for the analysis. First the economic indicators are discussed, continuing on chapter 3. After that, passenger numbers are discussed, including the development of these numbers over time.

4.1.1 Passenger Data (Dependent Variable)

Table 7 summarizes the collection of passenger data for the 5 airports. It provides the time frame, the source for the particular airport and time frame as well as problems that occurred during data selection.

A note for Skopje airport is that the provision of data from 2004-2009 is not publicly available. After multiple requests, the current airport holder TAV was still reluctant to provide the data for the purpose of this thesis.

Table 7. Data collection of passenger numbers

Country	Airport	Statistics	Source	Problems
Bosnia	Sarajevo	Monthly 2004-2008 2008-2013	Bosnia and Herzegovina Directorate for Civil Aviation Sarajevo Airport Statistics	-
Croatia	Zagreb	Monthly 2004-2013	Zagreb Airport Croatian Aviation Authority	-
Kosovo	Pristina	Monthly 2004-2013	Kosovar Civil Aviation Authority	-
Macedonia	Skopje	Monthly 2010-2013*	Macedonian Civil Aviation Authority	Data 2004-2009 not provided
Serbia	Belgrade	2004-2013	Belgrade Airport Statistics	-

The appendix gives an overview of the 5 airports and their **quarterly** statistics for 10 years (2004-2013.) in figures 1 to 5. To illustrate differences and give an overview of growth, table 8 provides the yearly figures for all airports.

Table 8. Passenger numbers for the 5 airports, 2004-2013 (x1000)

<i>Year/Airport</i>	Belgrade	Pristina	Sarajevo	Skopje	Zagreb
2004	2,045	910.8	406.4	495.0	1,408
2005	2,032	930.3	440.6	521.0	1,552
2006	2,222	882.7	466.0	542.1	1,728
2007	2,513	990.2	505.2	626.1	1,992
2008	2,650	1,131	506.3	652.3	2,192
2009	2,384	1,177	530.3	599.5	2,062
2010	2,700	1,306	563.3	681.1	2,054
2011	3,125	1,422	599.9	759.9	2,319
2012	3,364	1,527	580.1	828.8	2,340
2013	3,543	1,629	665.6	984.4	2,300
Total Growth	73,2%	78,9%	63,8%	98,9%	63,3%

Noticeably, a few things can be derived from this table. At first, Sarajevo and Skopje airport start with similar passenger numbers. In the early years (2004-2006) the difference in passengers was less than 100 thousand. That difference has increased from 100 thousand, to 180 thousand in 2011 and more than 300 thousand passengers in 2013.

Passenger numbers have risen in all of the countries when validating for the whole period (2004-2013.) It is noticeable that all five airports managed to increase their passenger numbers by at least 60% over the past 10 years as depicted in figure 16. Sofia airport in Bulgaria, with whom Zagreb and Belgrade like to compare themselves has seen an increase in the same period of around 117%. Sofia is served by several LCCs that cover over 20 destinations. The top three when it comes to percentual growth over this time period also happens to be the top three when it comes to LCC flights serving the airport (Skopje, Pristina and Belgrade.) Skopje recorded a growth of almost a 100% in 10 years even though Macedonia has not had a national carrier for most of the time.

There are some important differences between the airports over this period. The slowest year was recorded in Sarajevo, 2004, when just over 400.000 passengers passed through the airport. On the other hand the record year of this dataset comes from Belgrade in 2013, when slightly more than 3.5 million passengers made use of the airport. These differences and possible reasons behind it are to be examined of course but are also briefly touched upon in Chapter 2.

It shows that all airports managed to improve their passenger numbers over this 10-year span. Zagreb and Sarajevo come in last place, managing to improve their numbers with just over 60%. Skopje is the clear winner in this case, almost managing to double its numbers within these years. As shown in chapter 3, Skopje has quite a large presence of LCCs through Wizz Air.

4.1.2 Periodical Passenger Growth

Zagreb and Belgrade are the top performers, both serving well over 2 million passenger annually. A breakdown is made in the total passenger growth as found in figure 16. Apart from the total time frame, the periods 2009-2013 and 2010-2013 are included. 2009 is the year in which the crisis affected aviation for a full year. From 2010 onwards, LCCs began exploring the region of former Yugoslavia. Furthermore, Bosnia and Serbia saw their visa regulations abolished which could have spiked travel further as well. Therefore, Figure 16 represents the average growth from 2004-2013, 2009-2013 and 2010-2013 to see whether there are major differences between them.

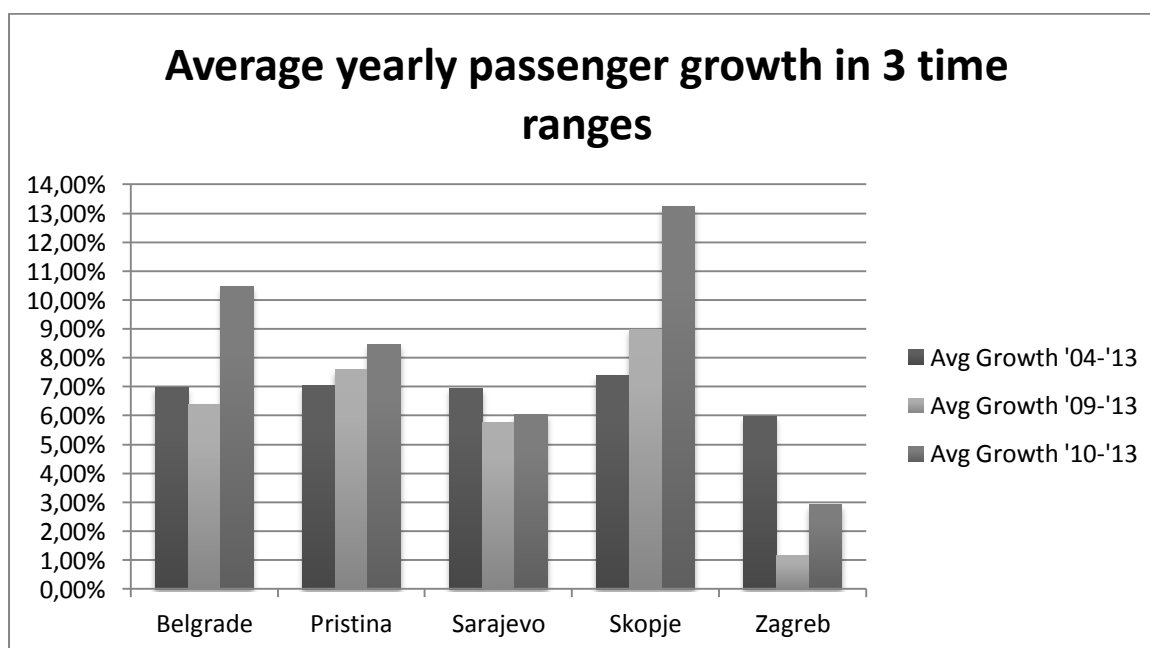


Figure 16. Average periodical growth rates for all five airports.

For all airports, the average growth in the period '10-'13 is larger than the growth for '09-'13. As mentioned 2010 was the year in which the first LCCs entered the former Yugoslav market. The biggest growth comes from Belgrade and Skopje, two airports who have been quite busy trying to lure new (low cost) companies to their airports, whereas Zagreb is trailing in each period as it has been struggling to attract new carriers over the past years.

4.1.3 Independent Variables

This section describes the use of the variables found in Chapter 2 as well as the sources used to obtain the correct numbers.

GDP: The data for GDP is taken in LCUs (Local Currency Units.) The computation of the per capita component is done by dividing it over the total population. This might be more complicated than taking GDP per Capita data, this was however only available at yearly intervals for most of the time frame and countries. GDP per capita is the main economic indicator in the literature for influencing passenger numbers. This is to be examined in the model. Data is taken from the World Bank and Trading Economics.

Unemployment Rates: Unemployment rate is taken as the percentage of people (actively) looking for a job compared to the total labor force. These numbers should tell more about travel behavior as unemployed people usually have a lower disposable income, especially in these countries, where social benefits have been a longtime problem. The data is collected from the IMF and Trading Economics.

Trade: As FDI data was not available in the form or frequency needed for this research, a proxy-variable was found in Chapter 2. Trade in this research is expressed as the ratio of import to export. Most of the countries are a net importer, but on different scales. Trade is found to stimulate air traffic, not only through cargo volumes but for instance business representatives visiting potential projects as well. Through this, passenger numbers are affected. Data is collected using statistical data from national statistical bureaus complemented with data from the World Bank.

LCC Operations: The operations of LCCs gradually started in the late 2000's and continuous large(r) scale operations commenced around 2010. This variable assesses the key question of this research, namely whether LCC operations significantly contribute to passenger numbers as a separate variable. LCC operations are collected through press releases from both LCCs and airports. When necessary, aviation databases are consulted.

Privatization: To mention privatization briefly, it is interesting to examine whether there is an impact of an airport being publicly or privately owned. Some airports in the region have undergone a change in owner / operator within the dataset's timeframe. A dummy is used for this variable, coded 0 for publicly owned companies, and 1 for private ones. The data on whether an airport is privately or publicly operated comes from the airports itself. This also goes for the date at which a change took place if there was any. The only airports that are operate privately are Skopje, Pristina and Zagreb, where the latter was only privatized recently.

Diaspora Size: The size of diaspora is an interesting variable, as many interpretations are possible. The definition given in Chapter 2 is used, with a small addition. The diaspora has to have a direct air link to the motherland. This is explained in section 4.1.5. The data for diaspora is mostly taken from platforms that unite diaspora. Kosovo for instance has several of these large organizations that represent the Kosovar diaspora in Germany and Switzerland. If this source is unavailable or non-existent, data from statistical agencies of both diaspora countries and the motherland are used.

There is however one problem that arises when assessing these diaspora numbers. The numbers have barely fluctuated over the years. Germany for instance has had approximately 300,000 Serbian nationals since 1989. These numbers have changed somewhat because of the war in Former Yugoslavia as well as the break-up of Serbia and Montenegro later on. The change into two separate states in 2006 is the only major impact on all diaspora figures throughout the dataset. Furthermore, it is highly likely that (example) 40,000 Croats in Switzerland have a higher impact on diaspora numbers traveling to Croatia, than the almost 400,000 Croats in Chile. For reasons examined in chapter 2, only the diaspora in countries with direct air links to the 'home' country is taken into consideration.

Population: This indicator is used as it is a generally used indicator for airline routes and passenger flows. Apart from this it controls for the different variables that are taken as ratios to population such as GDP per Capita and Diaspora. The values are combined from national statistics agencies as well as the World Bank figures.

Special occurrences: Even though not inserted into the model as a separate variable, there is a list of occurrences that took place in the period 2004-2013 in the region as a whole or in one of the five countries specifically. This part of the dataset is kept out of the analysis but set up

to be able to link any inconsistencies to a specific occurrence. One of the models contains all quarters in a ten year time span. If there are outliers or unusual numbers found in this model, they can be compared to the data collected. The occurrences that are researched for are the global economic downturn and the ash cloud that covered a large part of European airspace after an Icelandic volcano erupted in April 2010 and impacted passenger numbers all over Europe. Even though the list operates separately from the variable ‘LCC operators’, which is used to assess the impact of the presence of (multiple) LCCs, it is also examined in the results whether the introduction of LCC flights can be derived from the (quarterly) model.

4.2 Model & Methodology

Chapter 3 gave an indication of some of the data and possible patterns that could be derived visually. Given that data across five countries over a time span of ten years is used, meaning there is a cross-section as well as a time dimension, panel data is used. This model is constructed to obtain the effects on passenger growth.

A standard panel data model can be depicted as follows:

$$y_{i,t} = a_i + x_{i,t}\beta_1 + x_{i,t}\beta_2 + x_{i,t}\beta_x + \varepsilon_{i,t}$$

In this case, the y stands for the passenger numbers as the dependent variable. The model examines whether there is an impact of LCC flights apart from standard economic effects. A model with a variable for LCC-connectivity. The different Beta-coefficients originate from the economic indicators used in this research.

As presented in section 4.3 and the appendix table AA1 the dependent variable passenger numbers contains large numbers. Apart from this, a test for heteroskedasticity (appendix table AA2) showed a very low p-value (p=0.000.) therefore indicating the presence of actual heteroskedasticity. Based on these findings, the variable passenger numbers was converted into logarithmic form. Because of the large numbers, the guidelines dictate for GDP per Capita to be converted into a logarithm as well.

Apart from this, unit root tests are also applied to the variables. This test examines whether the variables are stationary or not. An outcome that indicates that the variable contains a unit root has two consequences in this case. Firstly, it is better to take the first difference of the variable in the model, in order to assess the evolution over time. Secondly, the panel data

does not require a Hausman test any longer to determine the effects of testing. In order to take the level-form into account Fixed Effects are used in Panel Data when a unit root is found.

Based on the outcomes of these test that is applied to all variables (except dummies and ratios), of which the outcomes can be found in appendix tables BB, the first difference of the GDP per capita (in LCUs) had to be taken. The final model as used is best represented by the following formula:

$$\begin{aligned} \ln y_{i,t} = & a_i + \ln x_{i,t} \beta_1 + x_{i,t} \beta_2 + x_{i,t} \beta_3 \\ & + d \ln x_{i,t} \beta_4 + \varepsilon_{i,t} \end{aligned}$$

Leading to a mixed log-level, log-log interpretation in the model. The variable containing import-export ratios as well as the dummy variables present in the model weren't converted into logs as this is either not necessary or not possible.

As mentioned before, the fact that the unit-root test is rejected in the case of GDP per capita leads us to using a fixed effects panel data model. Fixed effects are assumed constant over individual data (the airports.) As Fixed Effects allows for within interpretation, the option to compare the individuals separately but over time is used. This gives insight in the development of the 5 airports over time. Furthermore the number of observations is nearly the same for all airports. Only the passenger numbers for Skopje airport are not complete.

To assess possible influence of the factor time, two different models are constructed. One model looks separately at each quarter in the model (39, as one quarter is used as reference.) The other model gives a coefficient for all four quarters over all years and for each year separately. Though deemed less specific, it might provide more insight on the effect of seasonality for instance. A variable for the presence of low cost carriers is inserted to assess the effect of the LCCs and whether a direct relationship can be derived.

4.3 Variable Descriptives

Elaborating on the previous section and Chapter 2, where the choice of variables is made, this section provides the descriptive statistics for the variables used.

4.3.1 Descriptive Statistics

Overall, there is an average presence of 1.7 LCCs in the region, and a maximum number of 9 LCCs at once is achieved. This number is slightly biased as LCCs operating seasonal flights are also included. These flights have to run for at least two consecutive months each year to be included here. The models are built to examine what kind of, if any, relation exists between the presence of LCCs and the growth in passenger numbers. Data sources as well as justification are found in the section preceding this one (section 4.2)

Table 9. Descriptive statistics for the variables to be included in the model.

Variable	# Observe.	Mean	S.D.	Min	Max
Year (quarters, SIF)	200	195.5	11.57	176	215
Log(Passengers)	176	12.64	0.67	11.20	14.02
GDP(per Capita) log	196	9.38	1.69	6.91	11.59
Unemployment	200	31.36	11.77	12.0	49.7
Import/Export Ratio	200	4.03	4.93	.954	35.75
LCC -connectivity	200	1.74	2.22	0	9
Privatization (Dummy)	200	0.24	0.43	0	1
Diaspora (Ratio)	200	22.46	12.96	5.86	45.93
Population (log, 1st difference)	195	0.00	0.003	-0.03	0.02

4.3.2 Correlation

A correlation table is a helpful tool in the process of gaining insight in different relations between the variables. Table 10 (on the next page) provides such information. Significant correlation ($p < .05$) is indicated in **bold**.

Table 10. Correlation for all variables included

	Year	Passengers	GDP per Capita (log)	Unemployment	I/E-Ratio	LCC-Connectivity	Privatization	Diaspora	Population (log, 1st diff)
Year	1								
Passengers	0.1864	1							
GDP per Capita (Log)	0.0253	0.7082	1						
Unemployment	-0.0645	-0.7518	-0.7439	1					
I/E-Ratio	-0.2238	-0.1334	-0.4479	0.4395	1				
LCC-connectivity	0.5976	0.1736	-0.2087	0.2313	0.2121	1			
Privatization	0.5193	0.0004	0.1012	0.0552	-0.0210	0.4357	1		
Diaspora	0.0787	0.2883	0.0606	-0.0223	0.1408	0.2490	-0.3300	1	
Population (log, 1st diff)	0.0268	-0.0941	-0.1787	0.1277	0.2450	0.2196	0.1571	-0.0841	1

Chapter 5. Results

In previous chapters, the background of this research as well as data is provided and an examination of the literature is conducted. This chapter gives the results found during this research and provides interpretation of the results.

Note: All interpretations regarding coefficients and effects of independent variables are given the fact that all other factors remain identical (Ceteris Paribus.)

5.1 Results

Based on chapter 4, two different models were set up for testing. One model where each quarter is taken separately and one model in which the quarters are taken over the whole dataset. The latter might be less specific, but could give an impression of seasonality effects. Table 11 provides the results for the variables used. Quarters and years are omitted for reader comfort. Coefficients that are significant at the 5% level are indicated in bold. Standard errors are given in brackets. Dummies are provided with an asterisk.

Table 11. Results for the two models

Dependent	Passenger Numbers (Log)	
	Quarters Model	Seasonality Model
Model		
GDP (per Capita, Log)	0.165 (0.137)	0.184 (0.125)
Unemployment	-0.002 (0.003)	-0.002 (0.003)
Import/Export ratio	0.014 (0.005)	0.012 (0.005)
LCC-Connectivity	0.029 (0.008)	0.026 (0.007)
Privatization *	0.056 (0.035)	0.054 (0.032)
Diaspora	0.016 (0.007)	0.015 (0.006)
Population (log, 1st diff.)	0.271 (4.284)	-0.670 (3.627)
Constant	11.13 (1.33)	10.03 (1.183)
R ² of the model (overall)	0.6112	0.6226
R ² - within	0.9390	0.9350

5.2 Interpretation

The models aimed to predict the effects of the variables by taking every quarter within this research into account separately. When looking at the coefficients for both models they are quite similar. There is also little difference within the significance. When taking every quarter into account separately, none of the variables shows a change in significance (when $\alpha = 5\%$.) There are variables however that would benefit from a higher alpha. These issues are addressed in the coming part.

In accordance with economic development worldwide, growth slowed down around the period 2008/2009 with the effects of economic crisis. The sign is consistent with the majority of the results found by Ishutkina (2009.) Even though the sign is consistent it must be noted that GDP (per capita, taking the log) does not have a significant effect ($p=0.232$) on passenger numbers in the quarterly model. The sign shows a positive relationship implying the variables move in the same direction. The coefficient remains approximately the same in the seasonality model, and is still not significant though the significance increases ($p=0.142$.) The effect of a 1% increase of the GDP per Capita (in LCUs) would have been in an increase of passenger numbers of around 0.18%. This might not seem much, but seasonal influences can have an influence of thousands of dollars.

Even though Crouch (1992) briefly mentions the variable and the reasoning in Chapter 2 to use the variable Unemployment has no significant contribution in both models. The quarterly model ($p=0.434$) performs a little better than the seasonality model ($p=0.448$.) The coefficient is that small that the impact would have been minor. The sign is negative which is consistent with the assumption that a decrease in unemployment could give a boost to passenger numbers, as more people have a (higher) disposable income.

Import/Export ratio provides better results in the seasonality model ($p=0.008$). The effect of 'trade' is positive and an increase of the import/export ratio by 1 would lead to 1.2% more passengers. The countries in this research have an imbalance in trade being that import is usually larger (in value (and volume)) than export. The quarterly model confirms the positive relation (sign) of this variable, remaining significant ($p=0.0009$). The effect increases from 1.2 to 1.4%. These findings support the claim by Pearce (2013), that air travel is gaining market share on the global trade market over time.

Being the key point of this research, a significant and positive effect of the number of LCCs present at an airport on the amount of passengers that pass through it is derived. As argued by

Smyth and Pearce (2007) the number of (LCC) air connections has an impact on productivity and passenger numbers. An increase in the number of LCCs operating to the airport with 1 operator leads to an increase in passenger numbers by approximately 2.9%. The quarterly model estimates this 2.9% increase per extra LCC significantly ($p=0.001$), whereas the seasonality model implies a 2.6% growth when an extra LCC enters the market ($p=0.001$.) Considering that certain airports have up to nine LCCs operating into it at certain periods, the impact is large. This supports the findings of Dobruszkes (2006) who shows that certain (secondary) airports have benefited greatly from the introduction of new LCC routes.

Privatization is a less important factor in this case. Ishutkina (2009) mentioned it as a possible contributor to increased passenger numbers. This effect is found here in the way that there appears to be a positive relation in both models. The Quarterly model shows a positive relation but an insignificant one ($p=0.109$.) If the airport is to be privatized, the Seasonality model ($p=0.096$) indicates that the number of passengers would be positive as well. If a higher alpha is taken, the effect of a privatization would be an increase of passenger numbers by approximately 5.5% compared to a publicly operated airport.

Diaspora size has a positive significant effect on passenger numbers in both models. The significance in the Seasonality model equals ($p=0.017$) and the Quarterly model ($p=0.035$). An increase of 1 in the diaspora ratio size implies an increase of diaspora compared to the total population. This results in an increase of passenger numbers by approximately 1.5%. Taking the closest diaspora into account (both in generation as physical proximity to the home country) in this research it supports the effect of diaspora with the restrictions / assumptions researched by Rajé (2011) and Tölölyan (2007)

Finally the population coefficient shows unexpected behavior. First of all, it is highly insignificant in both models: Seasonality ($p=0.854$) and Quarterly ($p=0.950$). As the variable is insignificant there is no need to interpret the magnitude of the coefficient. Yet, the variable shows a negative effect in the Seasonality model, whereas the sign changes to a positive effect in the quarterly model. Most countries in the dataset show declining population numbers. There is however an influx of diaspora, people who have retained their nationality, usually during summer, which increases over time. The quarterly model is more refined at interpreting this, whereas the seasonality model most likely focuses on the declining population over time in general.

Looking at the overall R-square, the seasonality model appears to be only the slightest better at predicting with an R-square of 0.6226 compared to 0.6112 for the quarterly model.

The seasonality model has as many significant variables as the quarterly model, although most of the variables in the seasonality model are closer to meeting the 5% criterion. As mentioned at the beginning, the differences between the models are very small, also in the coefficients.

5.3 Model Specific Results

This section aims to derive patterns and extra information from the models when looked at separately. The goal is to show the seasonal influences as well as explaining possible special findings in the quarterly model.

5.3.1 Seasonality model

Even though this model might not be as specific as the first model, it does make it possible to say a few more words about the effects of seasonality and a possible trend over the years. The year is divided into quarters for this research, with January-March being quarter 1, April-June quarter 2, July-September quarter 3 and October-December quarter 4. To illustrate the effects provided by the second model table 12 illustrates the effects of being in a specific quarter on passenger numbers with the first quarter as a reference point. The standard error is given in brackets and all quarters are significant at the 1% -level.

Table 12. Assessing Seasonality

Time	
Quarter 1	0 (omitted)
Quarter 2	0.321 (0.018)
Quarter 3	0.567 (0.019)
Quarter 4	0.153 (0.019)

To make it more visible figure 17 shows what the passenger division on average looks like when the quarterly division is maintained. It becomes clear, that when taking quarter 1 as a reference the 'standard' seasonality trend shows. A peak is recorded in the months July-September, which seems consistent with an average holiday destination. As these countries, except for Croatia, do not match this criterion entirely the pattern is most likely also influenced by diaspora travel behavior.

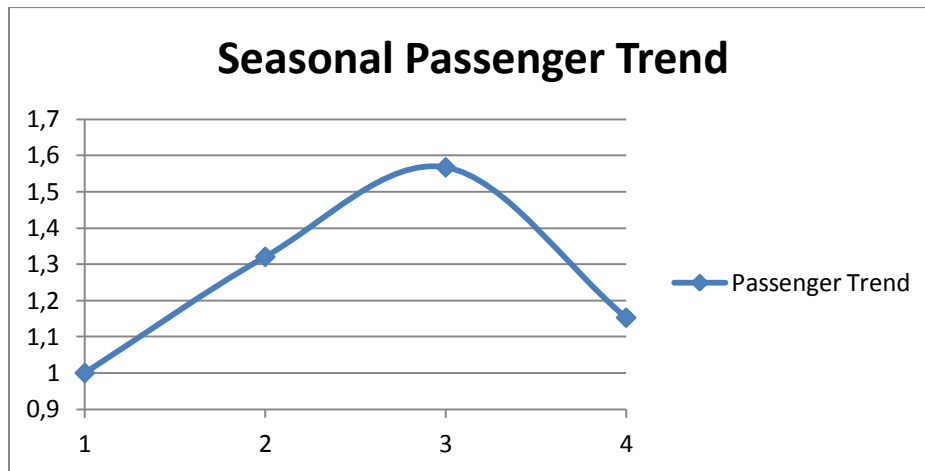


Figure 17. Passenger seasonality effects

Also interesting to note is the recording of the effect of the economic crisis in the effects of the years in this model. The table that provides this information is table CC in the appendix. All years are significant at the 5% level, except for 2005 ($p=0.152$.) The table clearly shows that the recovery from the crisis has taken at least two years. To illustrate the results here, figure 18 depicts the growth recorded in the model with 2004 as the year of reference. This development is a yearly one, without the quarterly effects as in the previous section. The trend remains the same nevertheless, with a dip in 2009, some recovery in 2010 and a relatively large increase in 2011, which coincides with the start of large-scale LCC operations in the region as mentioned earlier.

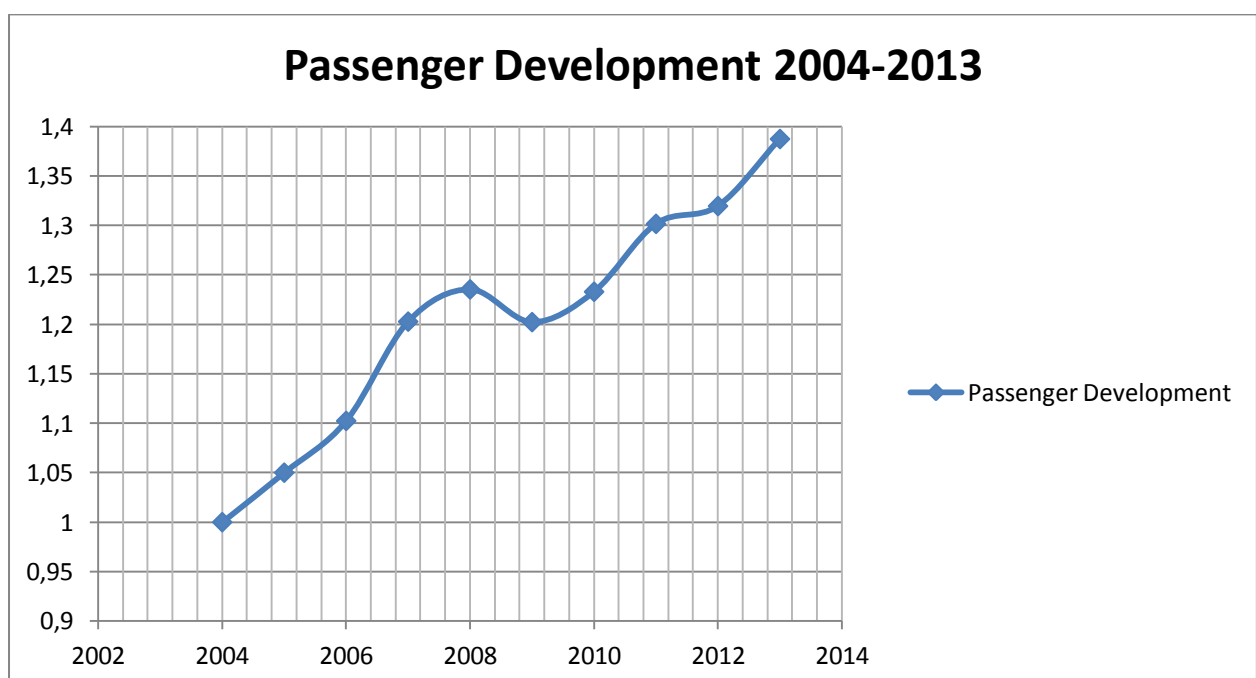


Figure 18. Passenger effects over time

5.3.2 Quarterly Model

The quarterly model has recorded the specific influence of every quarter in this research, ranging from the first quarter of 2004 up until the last quarter of 2013. This section provides an interpretation of these quarterly results. Apart from the seasonal influence, discussed in section 5.3.1, this section can also give insight in the development over time. As figure 19 illustrates, a repeated cycle is discovered. In a year, the two quarters with the most passengers are Q2 and Q3, containing the months ranging from April to (and including) September. The effect over time is shown by the fact that the repeated cycle gains height (more passengers) every year, except for 2009. The effects of the economic crisis are clearly visible as the passenger flow of 2010 is only a bit higher than the one in 2008. 2009 was the year in which the crisis struck in the world of aviation, with even 2007 performing slightly better in general.

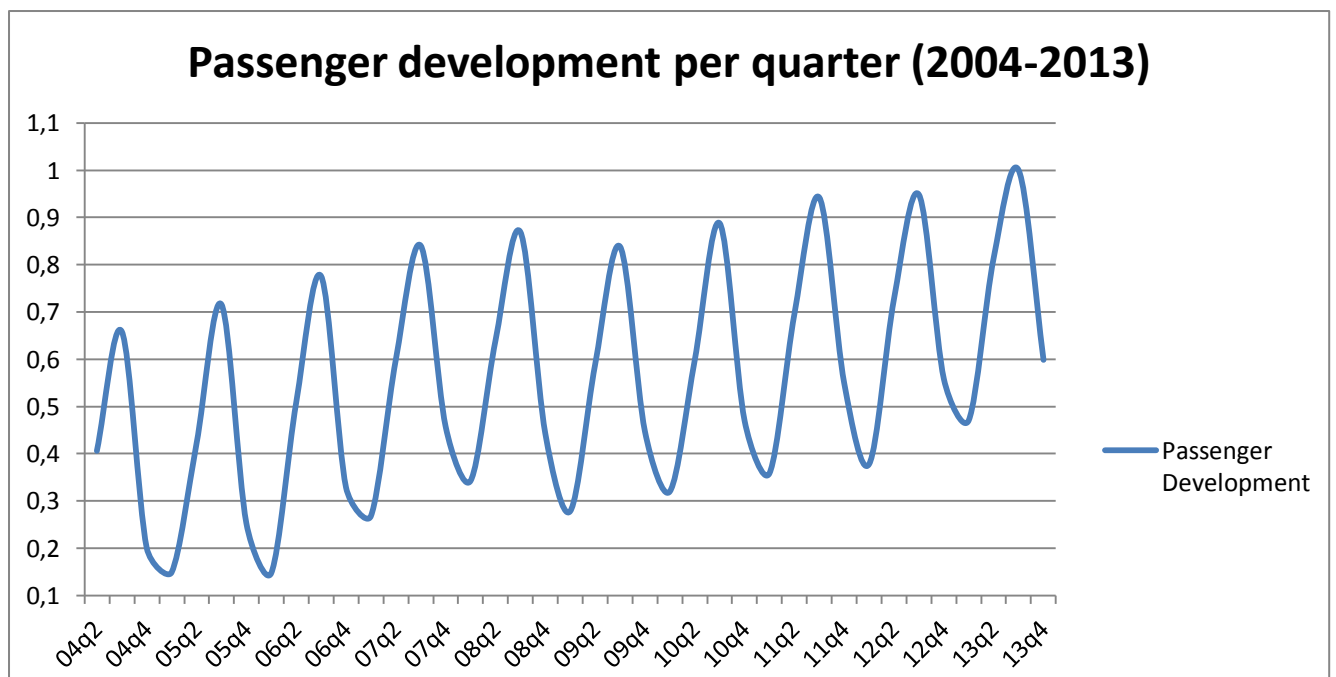


Figure 19. Passenger development in quarters.

5.3.3 Passenger Shocks (Quarterly Model)

Chi and Baek (2013) take a closer look at the effect of shocks in the market on the air traffic market. They find that shocks such as 9/11 or the SARS epidemic can have negative effects on air travel demand. Their results are all statistically significant at the 5% level for the passenger market.

Table DD in the appendix illustrate that some special occurrences in the world of aviation including the economic crisis can be derived from the results. Table DD shows that the recovery that was taking place compared to 2009 is not visible in quarter 2 of 2010. This can

(probably) be appointed to the explosion of the Eyjafjallajökull volcano in Iceland causing flights all across Europe to be disrupted and even suspended for several days as air spaces were closed.

Table DD further provides the data that supports the theory that the introduction of LCC-flights had an impact in the region to the extent that 2011 shows a quicker increase in numbers compared to other years. 2011 was the year in which large-scale operations were set up in former Yugoslavia, with Wizz Air opening several routes at once from both Belgrade and Skopje.

Chapter 6. Conclusion

This research paper had the goal of obtaining information on the impact of low cost air travel on passenger numbers at certain airports in Former Yugoslavia. In order to come up with an answer the main research question was:

Has the introduction of low cost flights contributed to the growth and recovery of aviation in five different countries in former Yugoslavia?

In order to find an answer to this question several sub-questions were posed:

- What factors influence the development of aviation in a country?
- A profile of the former Yugoslav countries: How have the key factors developed as well as aviation in these countries?
- Statistical Analysis: Is there any evidence to be found of the factors influencing aviation development using panel data?

Chapter 2 gives insight on the factors that influence aviation, from an economical perspective. As expected, a strong positive relation between GDP and the number of passengers is found. This research acknowledges a positive relationship between GDP and passenger numbers, although it is not significant in this case. Privatization also seems to have a positive effect, although it is not significant either. The expected relation between unemployment and passenger growth as discussed in Chapter 2 and 5 is confirmed to the extent that the relation indeed appears to be negative, yet insignificant.

Chapter 3 provided information on the countries in terms of economic performance based on the most important indicators found in Chapter 2 (GDP, Unemployment, Import/Export Ratio.) Data on the chosen airports in the countries was also provided in terms of passenger performance and whether the airport is publicly or privately owned. From chapter 2 and 3, the importance of diaspora was also derived. A significant positive relationship between diaspora and passenger numbers is found.

Chapter 4 and 5 provide the actual data and the analysis that was performed. Some alterations had to be made to implement everything correctly into the two models that were constructed.

The main question was to find whether there is an impact of the introduction of low cost flights in the region on the passenger performance of the airports. The effect of other important variables was also tested.

GDP per capita has a positive yet insignificant relation with the development of passenger numbers. As expected from the literature, passenger numbers are likely to increase when GDP per capita increases and vice versa. The effect would have been about a factor 0.16 with a 1% increase of GDP per Capita.

Unemployment does not contribute significantly, the expected negative relation with passenger numbers is found. The trade-ratio on the other hand plays a role as most of the countries import more goods than they export. As the countries are still developing compared to the rest of Europe, they are also interesting locations for businesses to invest in. Based on this, the positive relation between the ratio of import/export and passenger numbers is one that comes as no surprise and can be exploited and explored by either side.

The (one-time) effect of privatization must not be underestimated. An increase of more than 5% based on a change of operator of the airport is quite large if it weren't for the significance. In this case it can only be said that there is a positive relation to be derived. Governments will however take long-term effects on income and expenditures into account as well.

Diaspora size, as expected, shows a strong positive relation with passenger numbers. Most of the countries in Former Yugoslavia still have a large population abroad with strong national(istic) ties. These people often visit and, as shown in Chapter 2 in the case of Kosovo, are often big contributors to the economy of the country. This reflects in the sense that they visit the country a lot and thus the size of this group has a positive and significant effect on passenger numbers.

As only countries with a direct air link to the mother country are taken into consideration, this could be an eye-opener for governments and airport managers that indeed their market could be enlarged if they were to aim at connecting their airport with countries that contain a large number of people descending from the country in Yugoslavia. It is interesting to see that most of the airports in the research already seem to have adopted this strategy. Most air links are with countries that either have a large diaspora community of the specific country, or the ones that offer good connections to the countries with diaspora that do not have their own direct air link.

The key factor in the analysis was the variable that denoted the number of LCCs present at the various airports. The seasonality effect is partially based on them, as some LCCs only provide services to the Yugoslav countries during summer season or summer timetable. A 2.6 - 2.9% increase is recorded for every new LCC that enters the market. As depicted earlier, table DD in the appendix shows an effect that LCCs (could) have caused. Considering that multiple LCCs are operating flights on a year-round basis, a number that only increases during summer the effect should not be underestimated. Especially since Wizz Air started expanding rapidly by introducing multiple new routes and setting up bases in the Ex-Yu region. The number of routes offered by every LCC proved too volatile and the data available too unreliable to make an estimation with the number of routes. Therefore this is in this case the best possible estimation.

These questions can all provide a partial answer to the main research question. When combining all the findings and comparing the first observations based on literature and data found with the outcomes of the actual analysis a one can say that indeed LCCs have their own, specific effect on the development of passenger numbers. Every new LCC that enters the market in this region increases passenger numbers. LCCs prove to play a special role in the development of passenger numbers, airports, aviation and therefore the development and economic development in general in these developing countries.

Chapter 7. Discussion

No research is perfect, nor was it my intention and expectation to provide one. The final chapter gives some insight on the limitations of this research, in order to put the findings in a certain context. Ideas and suggestions for future research are also provided.

7.1 Limitations

There are a couple of things worth mentioning when assessing this thesis which could have impacted the results in some way. They are listed here in a random order.

1. Availability of data.

Certain variables did not have the full data available publicly and even after consulting the companies / ministries responsible for the provision of this data they couldn't be obtained. Skopje airport only provided quarterly passenger data from 2010 onwards. Current airport holder TAV was not eager to provide any statistics before this period. This could also be due to the fact that they were not the operators of the airport before 2010. Despite this, the Macedonian CAA also had no interest in providing these figures. Because Macedonia is one of the biggest 'playgrounds' for LCCs, this could have had its impact on the accuracy of assessing the impact of Low Cost Carriers.

2. Availability / Proxy variables.

The variable FDI proved to be a variable for which data is quite plentiful. This data is however not provided in the quarterly form that is much needed for this research. Instead of completely dropping the variable I examined possible relationships with other variables that could serve as a proxy. Arčabić et al. (2012) provide an interesting view on the relationship between FDI and the stock market (focused on Croatia.) They find that evidence that supports the theory of both a short- and long term effect being present. However, with Kosovo lacking a stock market completely, another proposition is the ratio of import to export in these countries. Trade, just as FDI, is known to have a positive effect on GDP and development in general. Something that Makki and Somwaru (2004) confirm in their research on the effect of FDI and trade in developing countries. However, this relationship was not examined in this research so discrepancies may follow from this proxy variable.

3. Region specific limitation.

Former Yugoslavia is a region that comes with its own flaws. Most countries have a huge grey/black economy for which data is not available or lacks accuracy. Money that is earned or spent in this market could of course also initiate travel or provide more funds for travelling. The effect of these actions couldn't be incorporated in this research.

7.2 Future Research

There have been some developments recently that make it interesting to build further upon this research.

First of all, LCC presence seems to spread across the region. Apart from the spreading, LCCs appear to have a tendency for secondary airports even in this region now. Tuzla in Bosnia has become a new base for LCC Wizz Air, whereas Niš in Serbia is expecting Wizz Air to launch flights this summer (2015.) It would be interesting to see if this development leads to an internal 'battle' between primary and secondary airports in the region.

Secondly, not all airports and countries are taken into consideration. The reason is provided in Chapter 1, being the dominance of a flag carrier / alliance or the lack of an LCC operating to the airport. Two things, specific for the region, provide enough questions for future research. Firstly, the dominance of the Star Alliance is an issue. Sarajevo sees two thirds of the flights operated by a Star Alliance carrier. Could this lead to less competition? And therefore to higher prices and therefore to less passenger growth even though the economy is growing? Secondly, the impact of an LCC starting flights to such airports could be bigger. What if a company with significantly lower air fares enters the market? Is there a market distortion? Will it lead to the withdrawal of companies or only to lower fares, and therefore a quicker / larger growth in general?

The effect of the amount of routes per LCC is a factor that could not be taken into consideration as mentioned in the conclusion. Wizz Air is well known for rapid expansion at airports they choose to fly to. It may therefore be interesting to consider every route of an LCC separately and identify the effect of multiple routes operated by the same LCC.

A combination study from a more political point of view could also provide interesting insights. The governments in these regions are still built on ground of nationalism and pride. Keeping flag carriers alive at all cost sometimes seems more important than developing sustainable infrastructure, be it through low cost flights. Whether or not this has proven to be

a burden remains to be seen. On the other hand, some governments provide incentives to LCCs if they connect their country with other destinations. The influence of the choice of the government as well as the type of operator (public vs. private) should be considered as possible influential factors.

Lastly, the interest of governments in the region to (partly) privatize companies is booming nowadays. The former JAT of Serbia is now called Air Serbia and 49% of the shares is held by Etihad Airways. In response, Qatar Airways has expressed interest in Croatia Airlines and Adria Airways. These buys always come with change and restructuring. The impact of this was not present during the period researched in this thesis, but could lead to other results or insights if this research were to be repeated in a couple of years.

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Appendix

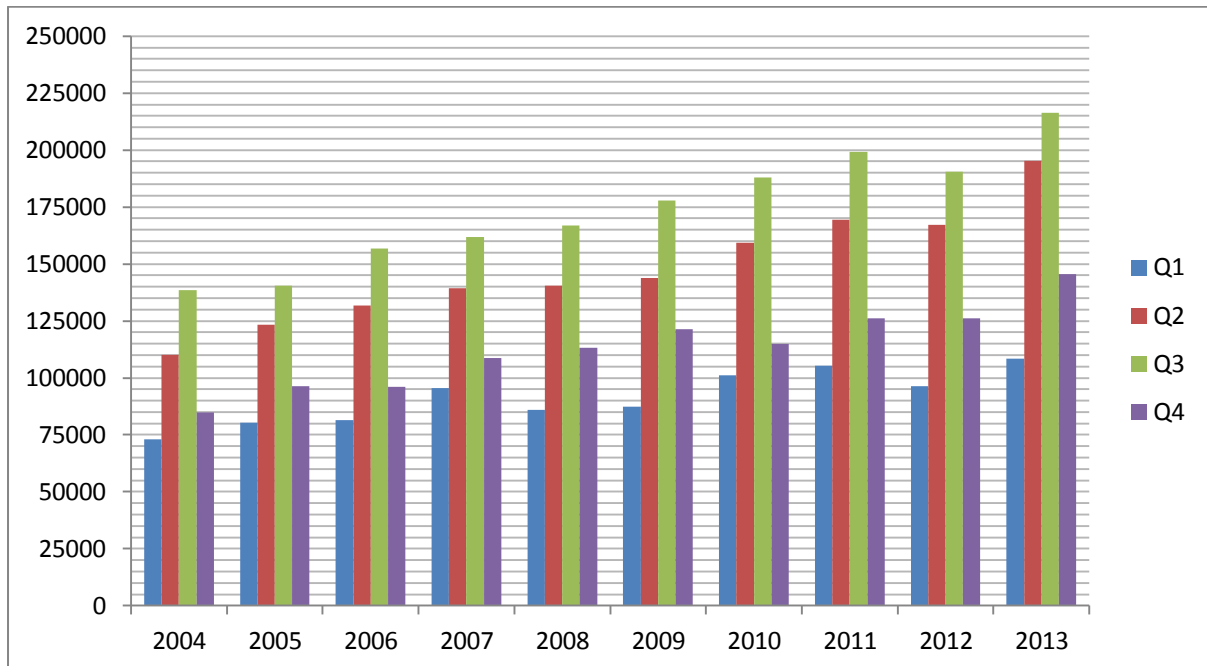


Figure. 1 Quarterly statistics for Sarajevo Airport (Bosnia)

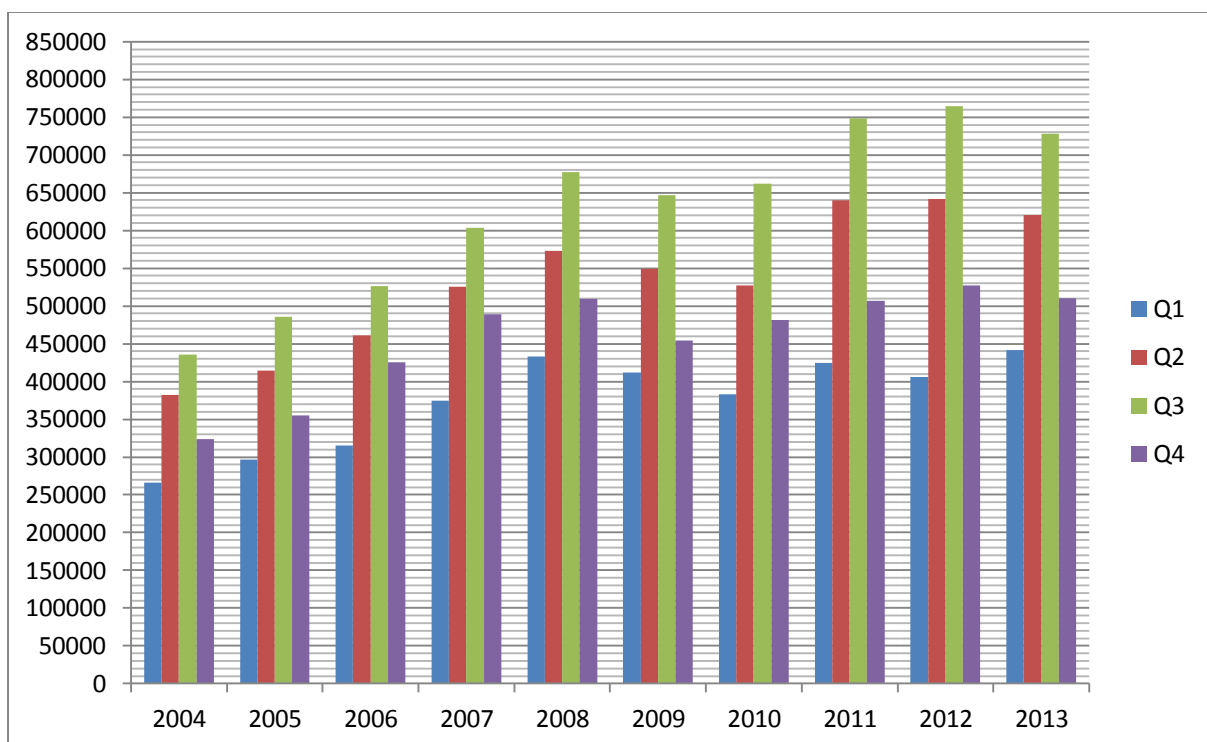


Figure. 2 Quarterly statistics for Zagreb Airport (Croatia)

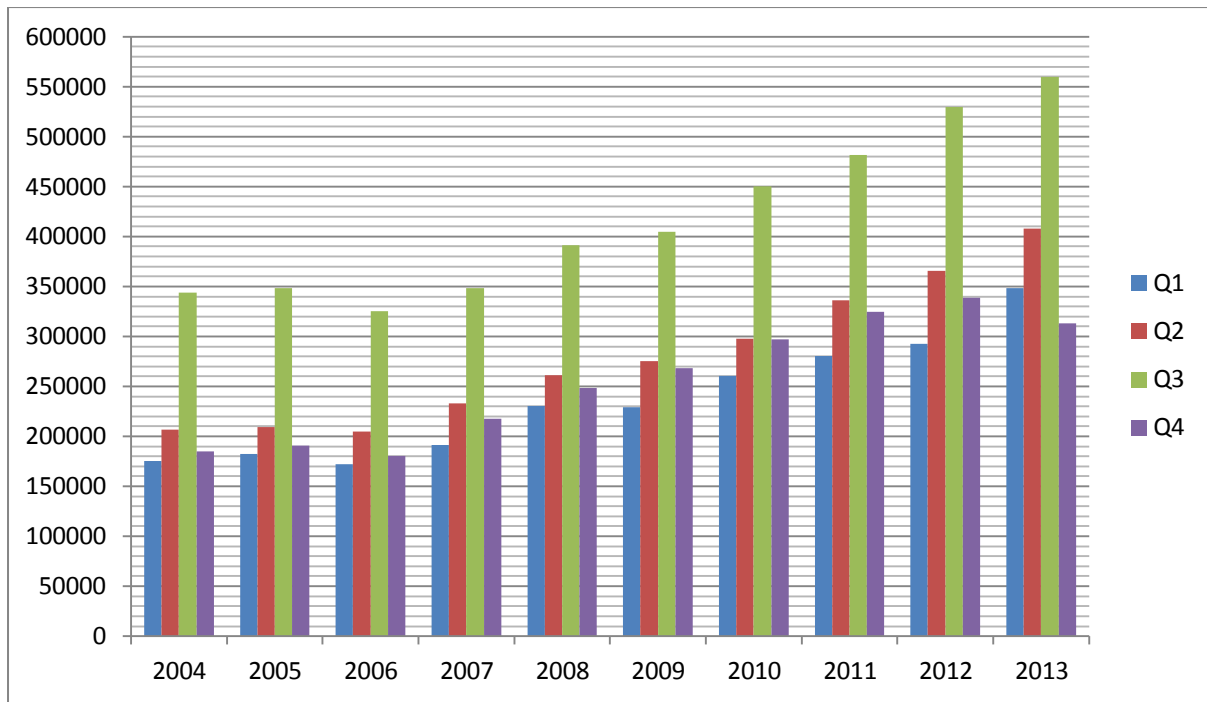


Figure. 3 Quarterly statistics for Pristina Airport (Kosovo)

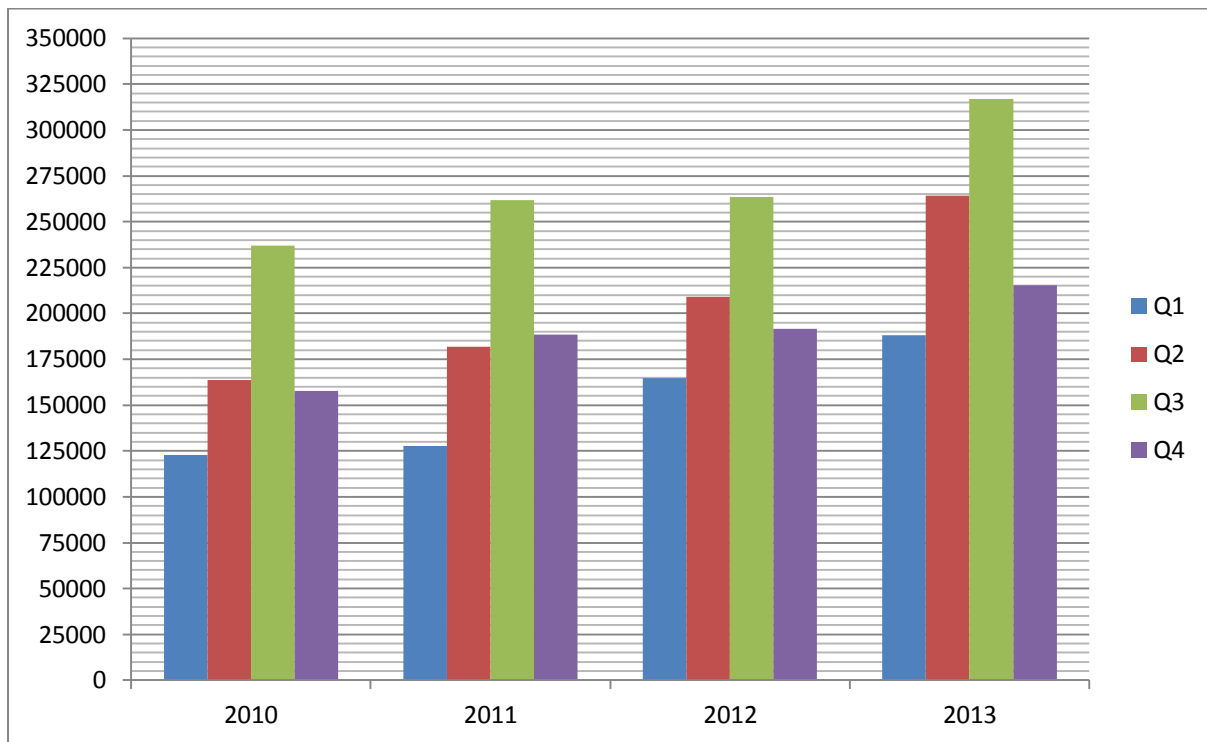


Figure. 4 Quarterly Statistics for Skopje Airport (Macedonia)

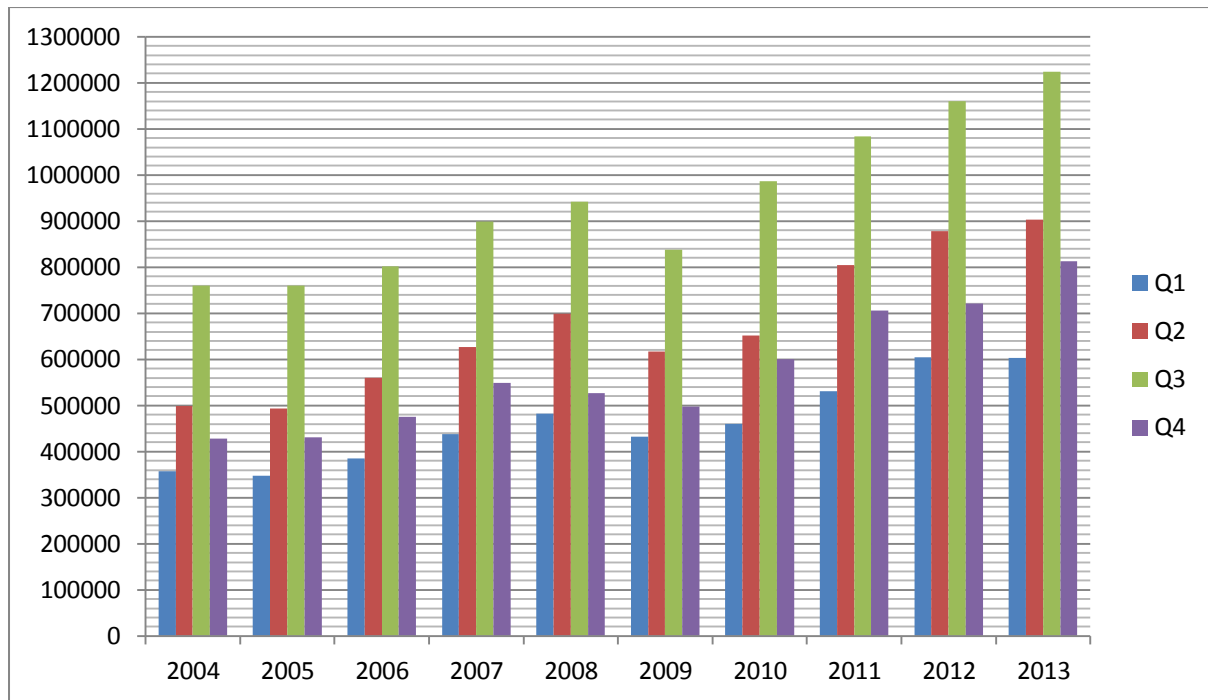


Figure. 5 Quarterly Statistics for Belgrade Airport (Serbia)

Table AA1 Large numbers in dependent variable

Variable		Mean	Std. Dev.	Min	Max	Observations
pax	overall	380392.8	239950.4	73049	1223457	N = 176
	between		219375.1	131596.5	664439.4	n = 5
	within		131745.5	63339.47	939410.5	T-bar = 35.2

Table AA2 Test for heteroskedasticity on passenger (pax) variable

chi2(1) = 19.14
 Prob > chi2 = 0.0000

Table BB1 unit root test (log of GDP per Capita)

Fisher-type unit-root test for lngdplcucap

Based on Phillips-Perron tests

```

-----
Ho: All panels contain unit roots      Number of panels      =      5
Ha: At least one panel is stationary   Avg. number of periods = 39.20
AR parameter:      Panel-specific      Asymptotics: T -> Infinity
Panel means:      Included
Time trend:       Not included
Newey-West lags: 2 lags

```

		Statistic	p-value
Inverse chi-squared(10)	P	41.3340	0.0000
Inverse normal	Z	-3.6789	0.0001
Inverse logit t(29)	L*	-4.6118	0.0000
Modified inv. chi-squared	Pm	7.0065	0.0000

Table BB2 unit root test (log of Passenger Numbers)

Fisher-type unit-root test for lnpx

Based on Phillips-Perron tests

```

-----
Ho: All panels contain unit roots      Number of panels      =      5
Ha: At least one panel is stationary   Avg. number of periods = 35.20
AR parameter:      Panel-specific      Asymptotics: T -> Infinity
Panel means:      Included
Time trend:       Not included
Newey-West lags: 2 lags

```

		Statistic	p-value
Inverse chi-squared(10)	P	75.3890	0.0000
Inverse normal	Z	-7.1692	0.0000
Inverse logit t(29)	L*	-9.4579	0.0000
Modified inv. chi-squared	Pm	14.6214	0.0000

Table BB3 unit root test (log of Population)

Fisher-type unit-root test for lnpop3

Based on Phillips-Perron tests

 Ho: All panels contain unit roots Number of panels = 5

Ha: At least one panel is stationary Number of periods = 40

AR parameter: Panel-specific Asymptotics: T -> Infinity

Panel means: Included

Time trend: Not included

Newey-West lags: 2 lags

		Statistic	p-value
Inverse chi-squared(10)	P	9.0269	0.5296
Inverse normal	Z	0.0061	0.5024
Inverse logit t(24)	L*	0.1244	0.5490
Modified inv. chi-squared Pm		-0.2176	0.5861

Table CC Yearly coefficient change (Seasonality model)

Year	Coefficient	Change (YoY)
2004	1	-
2005	1.050	0.050
2006	1.102	0.052
2007	1.203	0.101
2008	1.235	0.033
2009	1.202	- 0.033
2010	1.233	0.031
2011	1.302	0.069
2012	1.320	0.018
2013	1.387	0.067

Table DD Quarterly changes / Special Occurrences (Quarterly model)

Quarter	Coefficient	Change (QoQ)	Change (YoY)	Likely Reason
Q1 - 2008	0.343	-	-	
Q2 - 2008	0.639	0.296	-	
Q3 - 2008	0.869	0.230	-	
Q4 - 2008	0.443	-0.426	-	
Q1 - 2009	0.279	-0.164	-0.064	Economic Downturn
Q2 - 2009	0.588	0.309	-0.051	Economic Downturn
Q3 - 2009	0.839	0.251	-0.030	Economic Downturn
Q4 - 2009	0.448	-0.391	0.005	
Q1 - 2010	0.320	-0.128	0.041	
Q2 - 2010	0.598	0.278	0.010	Volcanic Ash Cloud
Q3 - 2010	0.888	0.290	0.049	
Q4 - 2010	0.470	-0.418	0.022	
Q1 - 2011	0.359	-0.111	0.039	
Q2 - 2011	0.696	0.337	0.098	Introduction LCCs
Q3 - 2011	0.942	0.246	0.054	Introduction LCCs
Q4 - 2011	0.549	-0.393	0.079	Introduction LCCs