Essays on Tourism and its Determinants

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Abstract

This thesis is based on four essays dealing with tourism development and its determinants. Chapter Two explores the different definitions of 'tourism' and 'tourist', as well as the factors that influence tourism arrivals. We discuss traditional and more recent theories that underlie the study of the tourism industry. The third chapter examines the effect of tourism upon economic growth, investigating the effects of tourism specialization within tourism-exporting countries and non-tourism-exporting countries annually over the period 1995–2007, applying panel-data methods in cross-sectional growth regressions. This study finds that tourism does *not* affect economic growth in either underdeveloped or developed countries. Moreover, tourism might cause Dutch Disease in tourism-exporting countries owing to their over-reliance on the exporting of non-traded goods.

Chapter Four seeks to identify how institutional quality and aspects of infrastructure (internet access measured by size of country or per 100 people) influence tourist arrivals in a whole sample of 131 countries and in sub-samples comprising developed and developing countries (as defined by IMF criteria) using static and dynamic panel data. The findings indicate that internet access enhances the tourism industry, and most interestingly, that good governance is one of the most influential factors for improving and developing tourism.

Chapter Five diagnoses the determinants of tourism flows using panel-data sets including 134 originating countries and 31 destination countries (selected depending on data availability) focusing on ICRG data for the period 2005–2009. The methodology makes use of basic and augmented gravity equations, together with the Hausman-Taylor and Poisson estimation techniques, whilst comparing the performance of the three gravity-equation methods. The results suggest that lower levels of political risk contribute to an increase in tourism flows. Furthermore, common language (positively), common currency (negatively) and political factors

(particularly institutional quality) are the most prominent determinants in promoting (or deterring) tourism. Chapter Six gives concluding remarks.

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Thank you all from the bottom of my heart

Thaana Ghalia

Dedicated to My country

Declaration

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Supporting Publications

Journals

1. **T. Ghalia** and J. Fidrmuc, "The Curse of Tourism?," *Journal of Hospitality & Tourism Research*, December 2015. DOI: 10.1177/1096348015619414
2. M. Tajik, S. Aliakbari, **T. Ghalia** and S. Kaffash, "House prices and credit risk: Evidence from the United States," *Economic Modelling*, vol. 51, pp. 123-135, December 2015, DOI: 10.1016/j.econmod.2015.08.006

Conference Papers

I have presented material from **chapter 3** called “curse of tourism” at ESDS International Annual Conference,28 November, 2011

Also, I have presented the same paper above At 5th international conference on Advances in Tourism Economics, 6 - 7 June 2013, Coimbra, Portugal.

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CEPII	Centre d'Études Prospectives et d'Informations Internationales, Paris
EGARCH	exponential generalized autoregressive conditional heteroskedastic
EGARCH-M	EGARCH-in-mean
FDI	Foreign direct investment
GDP	Gross Domestic Product
GMM	Generalized method of moments
H-T	Hausman-Taylor (estimator)
HTM	Hausman-Taylor Model
ICRG	International Country Risk Guide/s
ILO	International Labour Organization
LDC	Less-Developed Country
OECD	Organization of Economic Co-operation and Development
OLS	Ordinary Least Square/s
PCA	Principal Component Analysis
PPML	Poisson Pseudo-Maximum Likelihood (estimator)
PRIO	International Peace Research Institute, Oslo
SARS	Severe Acute Respiratory Syndrome
TOAR	Tourist Arrivals
UCDP	Uppsala Conflict Data Project
UNDESA	United Nations Department of Economic and Social Affairs
UNWTO	United Nations World Tourism Organization
USAID	United States Agency for International Development
VECM	Vector Error Correction Model
WESP	World Economic Situation and Prospects
WTTC	World Travel and Tourism Council

1 Introduction

At any moment in time, there are many thousands of tourists beginning or ending their journeys to and from various venues around this planet. Furthermore, numerous meetings, exhibitions and conventions are in progress or being planned, whilst countless numbers of people are making their travel and holiday plans. In other words, travel and tourism is major global industry—big business that will continue to grow (Goeldner and Brent Ritchie, 2012). The World Travel and Tourism Council (WTTC) reported that the shares of world GDP and employment contributed by tourism and travel were 2.8 and 3.3 percent respectively during 2011–2012 (WTTC, 2012). Moreover, the average global annual intake of international tourist arrivals grew at the rate of 4.6 percent compared to GDP growth rate of 3.5 percent between 1975 and 2000 (UNWTO, 2012).

Tourism is defined by the UN World Tourism Organization (UNWTO) as the circulation of people who travel to or stay in places outside their home country (their normal place of residence and/or work) for short periods, usually no longer than a year, and for different purposes such as leisure, business, or any purposes other than formal employment (UNDESA, 2010 pp. 9–10). The destinations receiving tourist visits and activities can benefit in many ways, although distortions in the local and/or national economy can arise too, especially when they result from unplanned, uncontrolled or un-moderated dependence on the income and opportunities provided by tourism (Pleumarom, 1994). Tourism has the potential to generate increases in sales, outputs, labour earnings and employment in the host country, state or region (Garín-Muñoz and Montero-Martín, 2007; Ardahaey, 2011). The opportunities offered by the prospects of developing tourism in a particular locality are very attractive to business-minded people of all socio-economic backgrounds and conditions. As a result, tourism can give a valuable boost to the local economy of a destination, tourism can also become a foreign-exchange earner on a national scale, and thus an important source of exports especially for small and developing countries (Holloway *et al.*, 2009).

Not only does tourism increase external income and even foreign-exchange income, but also various studies have identified that it can also rapidly generate employment opportunities (Mathieson and Wall, 1982; Figini and Vici, 2009; Zortuk, 2009; Polat *et al.*, 2010; Vellas, 2011). It is not surprising, then, that many governments at local and national level aim to achieve development in the tourism sector because of the various benefits that tourism is perceived to offer. Nor is it surprising that such bodies tend to regard economic benefits as the most important measure of tourism, as these can help achieve a positive balance of payments and stimulate the sectors dependent on tourism, thus tending to benefit the local area and the wider country as well (Ivanov and Webster, 2006; Polat *et al.*, 2010). Many researchers have studied the importance and economic effects of tourism and business travel using a variety of approaches, such as Fletcher (1989), Archer (1995), Archer and Fletcher (1996), Dwyer *et al.* (2000a), Kweka *et al.* (2001, 2003), Sahli and Nowak (2007), Blake *et al.* (2008). Zortuk (2009) found a direct relationship between Gross Domestic Product (GDP) and tourist arrivals.

One of the main drivers behind the growth in international tourism is the desire to experience the culture of tourist destinations. The increasing significance of cultural interest in generating tourism has been identified as an important ingredient in regional competitiveness for a considerable period of time (OECD, 2008). The OECD (2008) study reported a 45 percent increase in cultural travel from 1995 to 2007, with cultural trips comprising 40 percent of overall international tourism in 2007.

Cultural organizations established by some developed countries, such as the Alliance Française (France, established 1883), the British Council (UK, 1934), the Goethe Institut (Germany, 1951), the Instituto Cervantes (Spain, 1991) and the Confucius Institute (CI) established by the Office of the Chinese Language Council International in 2004, have been playing a significant role in promoting the culture and language of their respective countries. The tourism industry, as one of the fastest growing industries in the world, is one of the main drivers in the world economy owing to its role in creating employment opportunities, generating income and export revenues.

In 2009, according to WDI (2010) and WTTC (2011), tourism accounted for 3.2 percent of global domestic income, 5.5 percent of total exports, 2.8 percent of global employment, and 24 percent of service-industry exports. Further evidence reflecting the substantial growth in tourism over the recent years can be seen in the average annual increase of 6.6 percent in tourism receipts between 1950 and 2009 (UNWTO, 2010). Moreover, the average annual increase of 6 percent in the number of tourist arrivals between 1950 and 2009 (UNWTO, 2010) is expected to further increase at a rate well in excess of that until 2020 (WTTC, 2011).

However, the non-economic benefits—such as social, environmental and other benefits — might not be so well identified (Pizam, 1978). It is true that cultural exchange between the host population and tourists can often generate social benefits (Armenski *et al.*, 2011). In addition, tourism is often considered to be a "clean" industry for the environment, although many debates surround this issue (Jenner and Smith, 1992; Croall, 1995; Kreag, 2011; Bastola 2012). However, there may often be adverse effects if the tourist trade is not well-managed (Hjalager, 1996; Howie, 2003; Fennell and Ebert, 2004). In spite of the often-mentioned benefits, tourism can also exert negative effects such as causing deterioration of the environment through the physical impact of tourist visits and the over-exploitation of natural resources (Kuss *et al.*, 1990; Cater and Goodall, 1992; Holzner, 2005; Capó *et al.*, 2007; Holzner, 2010). Tourism can cause unwanted lifestyle changes that might have negative impacts on the traditions and customs of the host community (Pizam, 1978; Nowak *et al.*, 2004; Cooper *et al.*, 2008). Furthermore, many studies have investigated whether tourism causes the disruptive economic unbalancing phenomenon known as the 'Dutch Disease' (e.g. Corden, 1984; Chao *et al.*, 2006; Capó *et al.*, 2007; Nowak and Sahli, 2007; Mieiro *et al.*, 2012). Moreover, previous studies such as that by Eilat and Einav (2004) suggest that there are many internal and external factors that might have an impact on tourism demand. These factors can include for example ethnic tensions, issues surrounding currency exchange rates, and internal or external conflicts.

Over the last two decades the tourism literature has developed massively in response to the rapid growth in tourism flows worldwide. Research into various aspects of tourism and tourism demand has assumed a new significance. Recent literature mainly focuses on studying the factors affecting demand for tourism in particular countries and forecasting tourism demand according to stronger theoretical background while employing statistical approaches. However, despite the extensive research being conducted in these fields, there are still several fundamental questions that we attempt to address in this thesis, such as:

- What impact does tourism specialization have on economic growth via trade?
- Do host-country features such as the communications infrastructure have any effect on the performance of the tourism sector?
- Do governance indicators affect tourism flows in the same way for countries at different levels of economic development, or do their effects depend on their population size?
- What role do destination-country institutions play in determining cross-border tourism flows?

Accordingly, this thesis aims to re-examine the different aspects of the relationship between tourism and economic growth in order to answer some of the above-mentioned questions that have not been sufficiently addressed in tourism studies, as well as to explore different aspects of tourism determinants using advanced econometric techniques. This thesis is based on four essays in the field of tourism determinants. Specifically, in **Chapter 2** we discuss the basic concepts of tourism, while in **Chapter 3, we** investigate the linkage between economic growth and tourism of 32 "tourism-dependent" countries within a sample of 131 countries annually during the period 1995–2007, applying panel-data methods in cross-sectional growth regressions for the countries. We then examine whether *tourism specialization* is a good option for underdeveloped countries whose GDP per capita is less than the average. After that, we seek to ascertain whether Dutch Disease exists in countries whose exports are dominated by tourism. The empirical results show that tourism specialization has no significant effects on economic growth and is related negatively to growth in the broad sample and in two smaller samples (tourism-dependent and non-tourism-dependent countries). Also, tourism specialization does not affect economic growth in two other samples: underdeveloped and developed countries. Finally, we show that tourism specialization might cause Dutch Disease in tourism-exporting countries owing to over-dependence on the exporting of non-traded goods. The empirical results suggest that tourism does not *always* lead to economic growth and it might even be considered detrimental.

Chapter 4 revisits how governance and infrastructure quality affect tourism flows. A thorough review of previous studies reveals that no-one has yet dealt extensively with the issue of whether host-country features (such as the communications infrastructure) exert any effects on the performance of the tourism sector. Furthermore, the previous studies that are available have focused only on specific countries or groups of countries, such as those in southern Africa. In this chapter, we examine communications infrastructure (of internet and telephones relative to size and population) in terms of panel data and with division into sub-samples. This chapter seeks to identify the most important determinants that have an impact on tourism (in terms of arrivals) in a whole sample of 131 countries and in sub-samples that comprise developed and developing countries. Sub-samples are also taken on the basis of the median population size of sample countries, and on the basis of World Bank indicators according to the 2012 classification. The determinants employed comprise economic, demographic, technological and political factors.

In addition, we use governance indicators as a proxy for institutional quality applying principal component analysis (PCA). The six indicators of good governance comprise accountability of power, political stability, rule of law, regulatory quality, corruption, and government effectiveness, in respect of their effects upon tourism. For this analysis, our sample covers 131 countries over the period 1995 to 2007. Furthermore, we applied static and dynamic panel-data methodology to our analysis. The results of this chapter indicate that the governance of the destination is shown to be an important factor influencing the process of destination choice, in the case of both developed and less-developed countries, but some interesting differences arise between them with regard to the impact of conflict. In particular, in developing countries violent events have a more profound effect on tourism arrivals than is the case for developed countries. Murdoch and Sandler (2002) found that violent conflict is observed to be more of a detriment to economic growth in developing countries in the short-term, and that its negative impact via tourism can harm the economy as a whole. In addition, in the present study the level of technology available in or for the tourist destination is found to be the main universal factor explaining comparative advantage within the tourism market.

Chapter 5 contributes to the literature on the tourism gravity model by using the ICRG data-set on institutional quality and political stability and examining the linkage between tourist flows and institutions in a global framework. This study applies the tourism gravity model while concentrating on the institutional enviorment which raised by the ICRG data set as they affect different countries. The gravity model (first posited by Tinbergen, 1962) is useful in making it possible to investigate trade flows between two countries by examining the distance between them and other factors that influence those flows. Many studies in tourism literature based on the gravity-model approach employ cross-sectional data, which is often the most appropriate form. However, the shortcoming of this approach lies in the possibility of its producing biased estimations owing to heterogeneity in the data drawn from different countries. To overcome this issue, panel data can be used instead of cross-sectional data (see for example Mátyás, 1997; Egger, 2000, 2002).

In order to employ the classical panel-data estimation methods, the model is first transformed log-linearly and then the multiplicative gravity equation is estimated. This approach applies when using either cross-sectional or panel-data estimation methods. When the latter are used, they are naturally controlled for data-heterogeneity among countries. Either the fixed-effects or random-effects estimation methods are applied when panel data are being analysed. On the other hand, when using cross-sectional methods, the traditional ordinary least squares (OLS) technique is usually applied. According to Santos Silva and Tenreyro (2006), the estimation results based on the logarithmic-transformed model could be misleading in the presence of heteroskedasticity. They showed that in the presence of heteroskedasticity the assumptions are in general violated. This conclusion stems from the phenomenon highlighted by *Jensen's inequality* (Jensen, 1906) that states that the expected value of a logarithm of a random variable does not equal the logarithm of the expected value.

The logarithmic transformation of the model is also beset by difficulties originating from the need to deal with zero-trade flows. In order to solve this problem, the gravity model should be estimated directly from the multiplicative form using the Poisson pseudo-maximum-likelihood estimation technique (Santos Silva and Tenreyro, 2006). This solution was first applied to cross-sectional data and later on to panel data. Westerlund and Wilhelmsson (2009) showed that, even when panel data are used, the presence of heteroskedasticity renders the traditional estimation biased and inconsistent when applying either of these two different approaches to gravity equation estimation on simulated and real data. In this chapter, owing to the need for a greater spread of data to yield relevant results, we applied our analysis on panel-data sets comprising 134 origin-countries and 31 destination-countries, which again were selected depending on relevant data availability. We estimated the gravity equation by using (a) traditional, (b) Hausman-Taylor, and (c) Poisson estimation techniques. We evaluated the performance of these three methods with respect to the theory of the gravity equation. The negative consequences of higher political risk for the tourism industry are highly important. To the best of our knowledge there exist no studies that investigate the effect of ICRG data using different methodology or gravity specifications. Thus this present study has undertaken to examine the various diseases of political instability (such as acts of terrorism, conflict, other forms of violence *et cetera*) that have negative effects on tourism.

Finally, **Chapter 6** summarizes the main findings of this thesis, and presents the major conclusions from the present research. It also offers some recommendations and suggestions regarding policy implications, and identifies and discusses the main limitations of this thesis. It ends with suggestions for future research that are beyond the scope of this thesis.

2 Tourism: Core Concepts

2.1 Introduction

Many authors have provided various definitions the term 'tourism' according to their point of view. So, the UNTWO (2010) has defined tourism as activities involving travelling and staying by individuals in locations situated away from their habitual environment for relatively short periods (usually less than one year). In addition, the reason for such activities should be leisure, business or other purposes *excluding* being employed by a resident person or body in the country or location visited. The elements of time duration and purpose of visit are derived from the seminal work done by Hunziker and Krapf (1942) which will be discussed later. Defining the term 'tourism' has led also to variance in the meanings accepted regarding the supply and demand of tourists, the economic status of the origin/destination country, and to movement of people between countries. The varying definitions that have been put forward need to be reconciled to develop definitions that have more universal application. The task in reconciling these variances appears to be less straightforward, owing to the need for strong collaboration between the sectors managing hospitality, transport, retailing, and attractions in order to fully understand the workings of and the returns from the tourism sector (Buhalis and Cooper, 1998; Buhalis, 2000; Brent Ritchie and Crouch, 2003; Smith, 2007).

Discussing the situation in Great Britain, Heeley (1980) defined tourism following two approaches. The first one reflected the essential nature of tourism, which can be related to four components: catering, transport, attractions and accommodation. The second approach addressed all the relationships involving the visitors who stay in the destination and do not exercise a *major* or *permanent* remunerated activity. This follows on from the definition of tourism made by Hunziker and Krapf (1942) that described it as the totality of different phenomena generated by visitors and the relationships existing between them and the host population, although their definition explicitly stipulated that the visit *did not lead to permanent residence*. Their definition also excluded *any earning activity*, and was one of the first to be generally accepted. Their influence on modern tourism studies continues to a certain extent because their ideas regarding relationships and economic status were incorporated in somewhat modified form into later ideas on tourism. However their technical definitions were weak because they had ideas concerning the social nature of tourism that depended heavily on the modes of visitation, visitor accommodation and the resultant relationships that were current at that time but have become outmoded (Shaw and Williams 2004).

Burkart and Medlik (1974) recommended that it would be advisable to differentiate between the conceptual and technical or practical aspects of tourism definitions. They were eager to develop theoretical definitions of tourism to encompass its various characteristics. Their work was taken up in 1979 by the British Tourism Society, which stated 'tourism is deemed to include any activity concerned with the temporary short-term movements of people to destinations outside the places where they normally live and work ,and their activity during the stay at these destinations' (quoted by Vanhove, 2005, page 2). From the foregoing, we can see the significance attributed to activities involved in visiting and perhaps staying at the destination. This is very much a demand-side model. The International Association of Scientific Experts in Tourism (AIEST) at its conference in Cardiff in 1981 declared tourism to be 'the entirety of interrelations and phenomena which result from people travelling to and stopping at places which are neither their main continuous domiciles nor place of work either for leisure or in the context of business activities or study' (quoted by Vanhove, 2005, page 2). This definition includes both the spatial and dynamic aspects of tourism, but again is very much weighted to the demand side of the totality.

However, to differing degrees tourism also involves the interaction between tourists and the local population. The definition should ideally make mention of the various interactions and outcomes arising from the relationships between the tourists, tourism suppliers, the government and the local people, thus introducing a supply-side aspect to the model. The International Government Conference on Travel and Tourism Statistics held by the World Tourism Organization (WTO) in Ottawa, Canada in 1991, stated 'tourism comprises the activities of persons travelling to and staying in places outside their usual environment for not more than one consecutive year for leisure, business or other purposes' (Holloway *et al.*, 2009, page 6). Like the previous definitions, this is very much concentrates on the demand side of tourism, concentrating the main points on definitions of tourism, travellers, and tourists. The expression 'usual environment' is intended to 'exclude trips within the person's community of residence, as well as other usual trips, frequent and regular, between house and place of work' (Page and Connell, 2006, page 12).

Regarding the distinction between a person's 'usual environment' and a tourism destination, many researchers have been concerned to include some element regarding the distances by travelled tourists away from their homes. For instance, in defining domestic tourism for statistical purposes in Australia, Stanford and McCann (1979) proposed that a tourist should had to have travelled at least 40 kilometres from the usual place of residence, and this definition is still used for determining 'overnight stays' by the Australian Bureau of Statistics (2003).

In addition, governments and academics have variously defined the term 'tourism' according to the themes prevalent in such domains as geography, economics, sociology and cultural anthropology. Geographers are interested in the locational aspects of tourism and how it changes the natural and built environment. Economists are concerned with the contribution of tourism to the economy and they focus on demand/supply, foreign exchange and other financial aspects. Sociologists and cultural anthropologists investigate the travel and consumer behaviour of people as individuals and groups, located within the milieu in which they travel and stay. The habits and traditions of hosts as well as guests are taken into account (Theobald, 2005). Hence, tourism embraces a composite of activities, services, accommodation facilities, industries, transportation, travel experience and other hospitality services that involve both the consumer (the tourist) and the supplier (Williams, 1998; Smith, 2007).

2.2 Basic Tourism Concepts

Tourism and tourists can be divided into various categories, and the anthropologist Valene Smith went so far as to identify five different types of tourism and seven different forms of tourist (Smith, 1989, pages 1–20). Taking a measured approach, we may discern the following types of tourism. *Domestic tourism* occurs when residents of a country visit destinations within their own country (subject to strictures about minimum distance travelled, *et cetera*). Another category is *inbound tourism* where visits to a country are made by non-residents. The combination of domestic tourism and inbound tourism may be called *internal tourism* although some authorities use this term to describe domestic tourism. Furthermore, *outbound tourism* consists of residents of a country visiting destination in other countries, which may be described as *national tourism*, although this would more strictly be applied to visits to a single political entity, whilst visits by the same person or group to more than one political entity might be called *regional tourism.* Finally, *international tourism* embraces the combination of inbound tourism and outbound tourism.

An analysis of tourism must also include an analysis of the tourist. So, in attempting to define the tourist, one must look at the tourist activity itself. According to Burkhart and Medlik (1974), the tourist activity consists of two elements: the dynamic element and the static element .This means that the tourism activity involves tourists staying at a considerable distance from their original place of residence for at least one night, in addition to the time taken for the journey or trip (Smith, 2004; Williams *et al.*, 2004).

The discretionary options of using time and monetary resources are other factors which can distinguish the tourist from the day tripper. This can be seen clearly in the case of holiday tourists and can be applicable also to certain instances of business travel. For example, conferences outside the workplace are normal day-to-day activities for the employees who are participants, while the particular circumstances might also mark them out to be tourists (Leiper, 1979; Smith, 2007). The consumption of economic resources is also another factor that can characterize the tourist, as defined by the nature and measure of the expenditure behaviour of the person in question. One sort of business travel that cannot be considered as tourism, however, involves seasonal workers and commercial travellers who are engaged in performing their routine jobs; they do not exercise discretionary powers in the same way as tourists, so they are not tourists. Tourists do not normally travel for the sole purpose of remuneration and this differentiates them from travelling workers

(Leiper, 1979; Pearce, 1993). Furthermore, geographical elements can define the tourist through the specific flow-patterns (Leiper, 1979; Smith, 2007), as elaborated below.

(A) *Tourist-generating regions* are the 'permanent residential bases of tourists, the places where tourists begin and end and in particular those features of the region which incidentally cause or stimulate the temporary outflow' (Leiper, 1979, p. 396). This definition embraces the geographical and behavioural factors that drive the tourist-generating regions. So the generating regions also form part of the travel and tourism market industry, as the relevant business help generate demand for touristic travel to the destinations. The most important marketing activities for the tourism industry are the promotional aspects: advertising, retailing and wholesaling .Determining these functions can assess why a particular tourist region might experience a tourist exodus, in addition to the economic and social conditions in the region.

(B) *Tourist-destination regions* are 'locations which attract the tourist to stay temporarily and in particular those features which inherently contribute to that attraction' (Leiper, 1979, p. 397). These attractions can be determined by the tourist in terms of several qualitative characteristics which he or she hopes to experience at the destination. The majority of tourist studies have assessed the tourist destinations in terms of location, accommodation, services, establishments, facilities and entertainment—in other words, where the most important aspects of the experience occur (Williams *et al.*, 2004).

(C) *Transit routes region* can be defined as 'paths linking the tourist-generating region along with tourist travel' (Leiper, 1979, p. 397). Transit routes are very important because their characteristics can affect the quality of access to a particular tourist destination.

2.3 Market for Tourism Products

A market, in all forms, can be defined as a place where the buyers and sellers come into contact with one another (Diaz Ruiz, 2012). Thus, the market of tourism is the place where tourism demand and tourists meet tourism supply, together with the persons, firms and institutions that work in the domain of tourism services.

2.3.1 The Demand for Tourism Products

'Tourism demand', as the term is normally used, refers to a range of tourism products—goods and services—that the consumer is well-disposed towards and able to purchase during a specified time within the set of given conditions (Song *et al.*, 2009, page 2). Tourism demand can be studied through various approaches. The economic approach examines tourism demand as the relationship between demand and price, or other factors. Meanwhile, the geographer takes into consideration the environment effect of the demand for tourism. The psychological approach studies many influences, not only on those who actually participate in tourism but also those who wish to (Cooper *et al.*, 2008). Buhalis (2000) suggests that tourism demand can be conceptualized as three basic types which form the total of tourism demand. First, there is effective demand, represented by the actual number of tourists who complete their trips. The second type, suppressed demand, consists of people who do not travel for some particular reason, either because of personal circumstances or owing to external conditions that make travel impossible. The third type, called latent demand, refers to the potentiality of a location or some particular feature to generate demand.

The demand for tourism differs from one place to another and from one specified period to another; these differences may be quantitative or qualitative because tourism demand is affected by a large group of economic or other factors. The most important factors are prices, incomes, price of other goods, fashion and tastes, advertising, leisure time and population.

2.3.2 Tourism Supply

The definition of tourism supply faces a major problem owing to the wide variation in the spectrum of tourism businesses and organizations that are involved, from those that are wholly dedicated to servicing tourists to those that also serve local residents and other markets (Cooper *et al.*, 2008, p.13). However, Rosselló-Nadal *et al.* (2007) viewed the tourism supply as a set of tourism products and services for tourists to use and consume at certain destinations. This definition thus refers to services that have for the most part been planned privately to meet tourism demand (accommodation, shopping, sports facilities, *et cetera*). On the other hand, Gunn and Var (2002) introduced the idea that the supply of tourism consists of all planned programs and land uses provided for receiving tourists, and that these programs are controlled by the policies and practices of all three sectors (private enterprise, non-profit-making organizations, and governments). The quantity and quality of tourism supply differs from one country to another as a result of a group of factors such as technical improvements, prices, prices of other goods provided, taxes and subsidies, and other factors including wars, industrial relations and the weather.

2.4 Factors affecting Tourism

In recent years the tourism sector has faced a number of problems and challenges generated by a range of factors, including economic, political, demographic, and technical factors, as well as threats and crises.

The economic factors include the exchange rates, income levels, competition and efficiency of the national economy (Prideaux, 2005). Several studies have investigated the impact of exchange-rate movements on tourism services. For instance, the spending of overseas tourists declines in real terms in the UK when the UK pound is strong. A bivariate analysis shows significant effects reflected in the relationships between a country's exchange rate and the expenditure-levels of overseas tourists in that country (Tse, 2001). This is seen in how the Asian financial crisis led to a growth of approximately 19.6 percent in Australian tourist flows to Indonesia during the 1997–1998 collapse in value of the Indonesian *rupiah*. Conversely, Indonesian tourist arrivals to Australia decreased by about 20 percent in the same period (Prideaux, 2005). Patsouratis *et al.* (2005) showed how exchange-rate fluctuations figure as an influential determinant of international tourism flows. Another important economic factor is the efficiency of the host economy—including the cost of public services and facilities, such as domestic transport costs, communication and cost of financial services. As the efficiency of the national economy improves, the demand of outbound tourism may increase (Prideaux, 2005). Political conditions, war, terrorism and political instability exert considerable influence on the decision-making processes of tourists. For example, Africa and Pakistan may have big game and majestic animals to hunt there, but the lack of personal safety acts as a serious deterrent to people unwilling to take such risks. The fear of terrorist activities likewise discourage people from making touristic visits to the areas affected. For example, after the September 11 attacks in the USA, the volume of cancellations made by private individuals and corporate bodies resulted in a loss of 2 billion dollars to the USA economy within the first month following the attacks (Goodrich 2002).

Furthermore, no country's tourist industry is immune to the effects of economic and financial crises elsewhere in the world. Papatheodorou *et al.* (2010) showed how the financial crises occurring in the summer of 2007 sent shock-waves that had grave consequences for national economies around the globe. The advanced economies showed a 7.5 percent decline in real tourism GDP during the last quarter of 2008 (IMF 2009a). The WTTC reported a drop in the growth rate of the travel and tourism industries to 1.0 percent in 2008 as a proportion of GDP. Various authors studied the possible effects that financial and economic crisis could exert on tourism. They showed that people who sustained income-loss during crisis conditions tended to finance their travelling plans from savings. If the economic downturn became lengthy, people would reduce their holiday expenditure (by taking shorter stays, visiting destinations closer to home, and so forth). If financial hardship became worse, they would cancel their plans (Smeral, 2009). Song and Lin (2010) predicted that the crisis would have a negative impact on both inbound and outbound tourism in Asia.

In addition, Brent Ritchie *et al.* (2010) investigated the impact of economic crisis 2008–2009 on tourism in North America—Canada, the USA and Mexico. They found that tourism had been affected by the economic crisis because in Canada the decrease in disposable income had influenced the future travel plans of Canadians, whilst regarding the United States, the events of 9/11 and subsequent politics had exerted an effect more serious than the later economic crisis. In the case of Mexico, natural disasters, such as swine flu, had exerted a greater effect on Mexico's tourism industry than the later economic crash. Similarly, Song and Lin (2010) show that the economic and financial crisis was bound to have a particular negative effect on both inbound and outbound tourism in Asia. In the meantime, many destinations outside Asia might attract more Chinese tourists and thus recover their tourism industry, if the Chinese economy were to remain strong during the next few years.

The tourism industry has begun to exploit technology. This will change not only the type and scope of the services offered, but also the sort and extent of work within the industry (Buhalis, 1998; Werthner and Klein, 1999; Pease and Rowe, 2005). Technology as a factor facilitates the speed and efficiency with which the tourism industry operates. Information technology in the tourism sector can reduce considerably the costs of information handling, increasing the speed of information processing, whilst customers are enabled to interact more effectively within the whole process. It also affords flexibility in product-adaptation and greater reliability in the transferring of information (Hudson, 2008, pages 8–11). Also, advances in technology have huge effects on the operation of business tourism, including presentation technology in conferences. According to the UK Conference Market Survey (2002) 86 percent of organizers used PC–based facilities for presentations at conferences. Furthermore, the quality of services and facilities is an important factor in the conduct of business tourism, such as using valuable time in holding meetings, training staff, as well as having within a destination good quality of transport systems, accommodation and restaurants.

Additionally, demographic change is one of the most influential drivers of developing trends in consumer behaviour in most European countries (Lohmann, 2004). Two important demographic trends are coming to prominence. The first in many countries is the rapid increase in the old-age population sector, owing to the rise in life expectancy particularly in the developed countries (e.g. Katz and Marshall, 2003; Bloom *et al.* 2011). Tomljenovic and Faulkner (2000), for example, found that older people are more favourably inclined toward tourism development than younger ones. Secondly, a declining number of children as result of falling fertility (particularly in industrial countries) in conjunction with the breakdown of traditional family structures. It is important to take account of this trend in forecasting a declining number of children as result of falling fertility particularly in industrial countries combined with the dissolution of traditional family patterns (Behnam, 1990). Also, in most cases people maintain the holidaying patterns acquired up to the mid-point of their lives. Therefore, their travel behaviours do not change simply when they enter their sixties or retire (Lohmann, 2004). This fact allows for predictions of much future tourist behaviour.

The occurrence of diseases also affects tourist flows, such as Severe Acute Respiratory Syndrome (SARS) which appeared in some countries and hit tourism business in 2003 (Wilder-Smith, 2006). Pine and McKercher (2004) found that when SARS appeared on 12 February 2002 in Guangdong Province in China, it had a negative effect on tourism industry across the world, with business travel being especially depressed owing to the postponement of and/or decline in capital investment. The WTTC (2003) reported the enormous impact of SARS on Hong Kong and Singapore in reducing the tourism contribution to GDP by 41 percent in Hong Kong and 43 percent in Singapore. Min (2005) examined the impact of SARS on tourism in Taiwan and found that arrivals had been severely reduced by the SARS outbreak. Natural disasters such as the December 2004 tsunami also deterred tourists from travelling to the affected countries (EIU, 2005). The spread of human fatalities as a result of the H5N1 avian flu virus was also a great deterrent to tourists (McAleer *et al.,* 2008). These problems adversely impacted on the image and the reputation of the affected destinations and caused many tourists to cancel their travel plans and remain in their own countries. Others problems negatively impacting on tourism are pollution and the rapid industrialization taking place in many cities and rural areas. Moscardo (1999) found that there was a relationship between environmental disasters and income hotel income along the Queensland Coast of Australia. Furthermore, the 1997 haze-related air pollution caused economic losses of about US$256 million to the tourism industry in Indonesia, Malaysia and Singapore (Anaman and Looi, 2000). Wang (2009) examined the impact of adverse events such as SARS and Asian financial crises events on the number of inbound tourism arrivals and found that any impact on safety—whether it be domestic or international—depresses tourism demand.

Climate and weather are important factors in planning in the tourism industry. De Freitas (2003) found that effective information regarding climate conditions facilitates effective management and business planning. Gómez Martín (2005), Kozak *et al*. (2008), and Becken (2010) showed that climate plays an important role in motivating tourists to travel. Scott *et al*. (2008) added that the presence of a better climate in a person's home region is related to a higher probability of domestic travel, whereas poor weather conditions increase the likelihood of a person's undertaking international travel.

2.5 Benefits and Costs of Tourism

Tourism has many benefits and it has a great impact on most countries. The impacts are economic, social, cultural and environmental, and their influence on tourism destinations might be positive and/or negative (Mathieson and Wall, 1982). Consequently, it is highly important for the tourism industry and destination residents to cooperate to plan for manageable growth and sustainable development (Buhalis and Cooper, 1998; Andereck and Vogt, 2000; Harrill, 2004; Dredge, 2010). Planning can help create a business sector with minimal costs to make tourism a blessing rather than a curse (Marzuki and Hay, 2013; Stylidis *et al.*, 2014).

According to UNWTO/ILO (2013), the economic benefits of tourism are derived through receipts from expenditure by visitors on accommodation, catering, and all the other services and goods generally required; these reached an estimated US$ 1159 billion (euro 873 billion) in 2012.

Various researchers have studied the relationship between tourism and the economy (e.g. Fletcher, 1989, 1994; Zhou *et al.*, 1997; Blake *et al.*, 2001; Dwyer *et al.*, 2003, 2004; Narayan, 2004). In his study of tourism in Spain, Blake (2000) found that an increase in tourism expenditure owing to an increase in tourist demand leads to an adjustment through a real exchange rate appreciation. Using a similar methodological approach, Narayan (2004) examined the economic impact of tourism on the economy of Fiji and concluded that tourism development leads to exchange-rate appreciation and to an increase in both domestic prices and wage rates. Tourism also helps some countries to withstand economic turbulence. For example, tourism in Cuba is a blessing because tourism has helped the Cuban economy to survive two disasters: the collapse of the USSR and the tightening of the US economic embargo on the island (Wilkinson 2008, page 981).

In a different way, Cortés-Jiménez *et al.* (2009) consider both exports and tourism as potential factors for economic growth; they use inbound tourism as non-traded exports. Meanwhile, trade of goods was an engine of economic growth in two developed countries: Italy and Spain. The authors confirmed the long-run hypotheses of exports-led growth and tourism-led growth for both countries. Thus, tradable exports and inbound tourism can be considered as important channels for inducing economic growth. Employment opportunities are some of the most important benefits of tourism, since tourism is a large industry and can provide many jobs. This range of jobs suits many categories of people, including young people, as there are part-time and full-time jobs in tourism. Őnder and Durgun (2008) found that tourism had a positive effect on employment in Turkey, and that there is a mutual relationship between the two variables in the long term.

Skene (1993a, 1993b) investigated the impact of tourism on employment in Australia. The studies also found that an increase in exports driven by tourism could offset an increase in imports, thus contributing to a balance of trade surplus. Therefore, tourism might be able to help the economy of the tourism destination to be less reliant on other sources such as agriculture and mining. This can be a benefit, and a significant one for regional rural communities. Figure 2.1 below shows that from 2000 to 2003 there was a decrease in employment and it reached its lowest point in 2003. Various changes of circumstances in subsequent years gave a stimulus to tourism and thus to employment, reaching a peak in 2007. Figure 2.1 shows the percentage of employment in tourism as part of economy-wide spending.

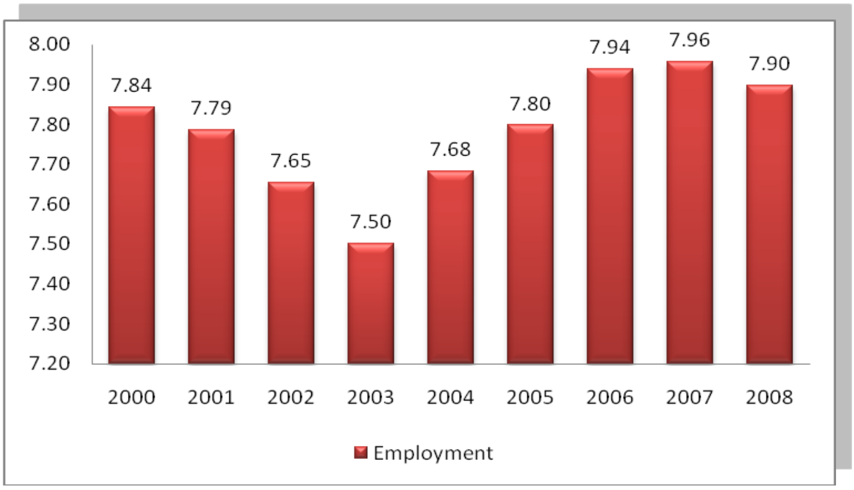

Figure 2.1 Tourism employment

Source: World Tourism Organization/International Monetary Fund

Various authors found that, on the negative side, tourism also gives rise to economic costs, derived from fluctuations in tourist demand and supply (Ball, 1988; Song, 2010; Ardahaey, 2011; Marcussen, 2011). Furthermore, tourist activity might give rise to inflation when the buying capacity of the visitors is greater than that of the locals. The effects can be seen in rises in the prices of land, catering and services (Butler, 1996; Wagner, 1997; Lindberg *et al.*, 2001; Archer *et al.*, 2005). Moreover, tourism can reverse and cancel economic benefits through creating high dependency on external capital and distortions in the local economy through the centralization of economic activity in a single sector (Frechtling, 1994). Many studies have tended to focus on tourism as a source of wealth without taking into account the possibility that the tourism industry might also become a curse owing to its over-utilization of local and natural resources. For example, Nowak *et al.* (2004) investigated the impact of a tourism boom on structural adjustment, commodities, factor prices and residents' welfare. They found that a tourist boom may cause the immiserization of residents if the beneficial impact which is caused by an increase in relative prices of non-traded commodities outweighs the negative effect which happens as a result of a loss of efficiency that occurs when returns increase to scale in the production and sale of manufactured goods.

Capó *et al.* (2007) studied tourism as 'Dutch Disease'. Their findings indicated the need to find a new export using natural resources to overcome the excessive dependence on tourism as an earner of external currency. They found that the tourist inflow boom of the 1960s induced a significant increase in wealth in Spain. But focusing on tourism and non-traded goods caused a lack of attention to industry and agriculture at the same time. Similarly, Chao *et al.* (2006) discussed the existence of Dutch Disease through a demand shock from a tourism boom using a dynamic framework, examining the impacts of tourism on accumulations of capital and welfare in an open dynamic economy. They showed that tourism can act to reduce local resident welfare as a result of the existence of externality which worsens the impact of industrialization. In addition, especially in a small island economy, the boom of inbound tourism may cause a loss of welfare when tourism activities and products use the coastal land areas intensively (Nowak and Sahli, 2007).

Regarding social and cultural impacts on tourism, the interaction between tourists and the host community can likewise be positive or negative for the host community (Mathieson & Wall, 1982). Cooper *et al.* (2008) showed that tourism can improve the quality of life in a tourist destination, by increasing economic activity and offering a range of facilities initially aimed at visitors but that might also be used by locals. Tourism might also cause beneficial change in the traditions and customs of the host community by fomenting cultural exchange (Besculides *et al.*, 2002; Carter and Beeton, 2004). Tourism might also help to preserve the cultural identity of the host location, by creating increased demand for the exhibition and exercise of local culture, which might otherwise have fallen into obscurity (Throsby, 1994; Quinn, 2009). Thus it can be argued that tourism can foment the conservation of cultural values and practices which might have been lost, if the locations had not been attractive to visitors (Richards, 1996).

Conversely, the effects of tourism might act to suppress and destroy local tradition and culture through a disparate degree of economic power and prestige enjoyed by the tourists (Robinson, 1999; Throsby, 2001). In other cases, cultural preservation by commodification has cost the communities their authentic traditional customs, folklore, crafts, festivals—all of which have been grossly modified for consumption by visitors (Shepherd, 2002; Carter and Beeton, 2004; McLeod, 2006). The social difference between local population and tourists is another negative impact (Robinson, 1999). Where the gradient of difference is so steep as to put local residents at a gross disadvantage, then they become little more than servants for the tourists, thus creating a certain resentment among the local populations against the visitors (King *et al.*, 1993). Tourism can thus establish a new form of colonialism based on local dependence on the income the foreign tourists bring (Teo and Leong, 2006; Wearing and Wearing, 2006). Such tourism-dependency can foster excessive drinking, alcoholism, gambling, crime, and drug-taking among the locals; it can cause these and other unwanted lifestyle changes that will lead to negative changes in traditions and customs (Cooper *et al.*, 2008). Tourism also can cause cultural degeneration of the destination (Pizam, 1978). In this situation the local people might allow tourists to trespass upon or violate cultural practices or norms that have been current and cherished in the local community (Pandey *et al.*, 1995). Otherwise they might try to adapt themselves to the customs and cultures of the visitors, and in that process they may possibly go so far as destroying the elements that underpinned the original attractiveness of the location for the tourist (Cohen, 1987).

Other negative aspects of tourism include the impact exerted on the environment through pollution (airborne, water-borne, solid), degradation of the natural and open landscapes, and destruction of flora and fauna (Jenner and Smith, 1992; Croall, 1995). The invisible costs of tourism on the environment mount up, including landscapes that have been used to build hotels and airports, whilst pollution of waterways and the sea seriously undermines the welfare and stock levels of fish (Cater and Goodall, 1992; Wilkinson, 1992). Whilst Wilson (1997) addressed the problems facing Goa owing to rapid development of the tourism industry, Sawkar *et al.* (1998) showed that tourism has nevertheless delivered many benefits to Goa, as also to the Maldives, through the allocation of funds to protect parks and to support resource management research. A properly managed tourism can act to enhance a country's appearance as well to preserve the environment.

2.6 Tourism and Economic Growth

The large number of empirical studies relating to this topic can be divided into two main categories: the first one examines the relationship between tourism and economic growth using time-series techniques such as causality and co-integration in each country individually. The second one applies panel-data methods, considering many countries together.

Using a panel-threshold model and measuring economic output by GDP, Chang *et al.* (2009:4; 2010) found that for the period 1975–2000 tourism growth ran at an average annual rate of 4.6 percent (UNWTO, 2008). During this period, the growth in tourism volume positively surpassed growth in economic output, although it fluctuated in line with GDP growth. When GDP growth was greater than 4 percent, tourism volume growth would be much higher than that, whilst in years when GDP growth was less than 2 percent, tourism growth was much depressed. They illustrated their point by plotting a graph showing the relationship between international tourism arrivals and GDP over the previous period (see Figure 2.2).

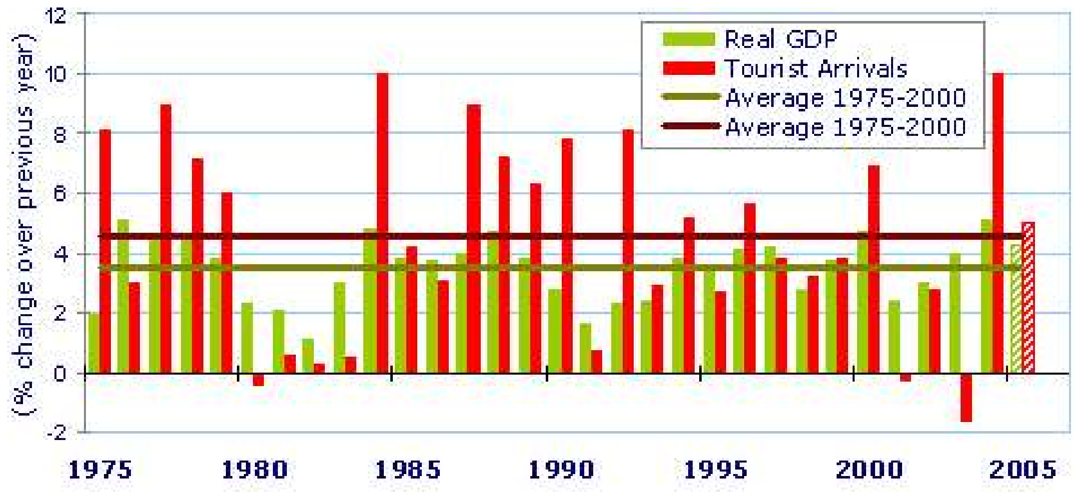

Figure 2.2 Economic Growth and International Tourist Arrivals 1975–2005

Source: World Tourism Organization/International Monetary Fund

In his study, Zortuk (2009) investigated the rapidly-developing tourism sector and the contribution that it was making to post-1980s economic growth. To this end he used the Granger Causality Test based on a Vector Error Correction Model (VECM) in order to examine the relationships between variables, the growth of GDP, tourist arrivals, and exchange rates in Turkey. The main results of his study showed a long-run relationship between Gross Domestic Product (GDP) and Tourist Arrivals (TOAR), as well as a unidirectional positive causal relationship. Using similar methodology, Balaguer and Cantavella-Jordá (2002), Dritsakis (2004), and

Sanchez Carrera *et al.* (2008) analysed the effect of tourism on economic growth in Spain, Greece and Mexico respectively; they concluded that there is a positive relationship between tourism and economic growth.

Furthermore, Barquet *et al.* (2009) also used causality-relationship techniques to study the link between economic growth and tourism expansion in Trentino-Alto Adige in Italy. In their study, GDP served to measure economic growth. They considered the relative prices between Trentino-Alto Adige and Germany as proxy variables for external competitiveness between 1988 and 2006. They concluded that international tourism expenditure positively impacted on the Trentino-Alto Adige economy; the relative prices produced a positive but slight effect. Furthermore, causality testing shows that the relative prices between Trentino-Alto Adige and Germany were weakly exogenous. Chen and Chiou-Wei (2009) applied an EGARCH-M model with uncertainty factors, examining the relationship between tourism and economic growth in two Asian countries: Taiwan and South Korea. The findings confirmed the hypothesis of tourism-led economic growth in Taiwan. For South Korea, they found a mutual causal relationship between the two variables under study. In contrast, Oh (2005) tested the causal relationship between economic growth and economic expansion in Korea. There were two main results: first, there is no relationship between the two variables of interest according to the co-integration test; second, the Granger Causality test implies a unidirectional relationship of economic-driven tourism growth.

Using similar methods but with a different proxy (four industries related to tourism—airlines, casinos, hotels, and restaurants) Tang and Jang (2009) examined the relationship between tourism and GDP in the USA; the results showed that there was no co-integration between economic growth and the tourism industry. Moreover, the Granger causality test exhibited a unidirectional causality from GDP to the aforementioned four industries, which may represent a small portion of these industries to the whole economy. In addition, the causality tests displayed a temporal causal hierarchy; this temporal hierarchy might be used as a tool for the public and private sectors since it offers a guide for organizing industries according to their importance for the whole set of tourism and economic outputs. Furthermore, the airline and hotel industries seem to provide essential performances that might help to establish effective plans for using resources in these two industries rather than dividing resources equally among all four industries. With a different methodology, Blake *et al.* (2001) used the input-output approach to examine whether tourism is a key sector for the US economy. Kweka *et al.* (2001, 2003) did likewise for the Tanzanian economy. These studies found that tourism affects the economy significantly. Moreover, they identified tourism as a potential sector for driving an increase in economic growth.

Eugenio-Martin *et al.* (2004) examined the relationship between tourism and economic growth in Latin American countries for the period 1985 to 1998 with an analysis based on a panel-data approach. The authors showed that an increase in the number of tourists per capita of local population has a positive effect on the economic growth of those countries having low and medium levels of income per capita, but not in the case of rich countries. This finding suggests that the increase in the number of tourist arrivals in a country offers an opportunity for economic growth for those countries that are still less-developed, but not for those countries that have become developed. Using similar methods, Sequeira and Nunes (2008) showed that tourism is a positive determinant factor of economic growth both in the total sample of countries and in poor countries of the sample.

In addition, Figini and Vici (2009) made a cross-sectional analysis to show the relationship between tourism specialization and economic growth. They used data for more than 150 countries during the period 1980–2005. In contrast to the findings of Sequeira and Nunes (2008), they concluded that there were no grounds to suggest that tourism-based countries would generally have a higher growth-rate than non-tourism-based countries. Arezki *et al.* (2009) also used a large cross-section of countries with instrumental variables techniques, covering the period between 1980 and 2002, to examine whether tourism specialization was a viable option for development. They defined a tool for tourism depending on the UNESCO World Heritage List. The result showed a positive relationship between the size of tourism specialization and economic growth. They supported this result with a great array of robustness checks. Furthermore, Po and Huang (2008) applied cross-sectional data for 88 countries over the period 1995–2005 to examine the non-linear relationship between tourism growth and economic growth. They recognized the indicator of tourism specialization (defined as receipts from international tourism as a percentage of GDP) as a threshold variable. The findings of the non-linearity tests shows that the countries fall into three different groups. The threshold regression results indicated a significant positive relationship between tourism development and economic growth when tourism specialization is less than 4.0488 percent (Group 1 = 57 countries) or over 4.7337 percent (Group 3 = 23 countries). However, if the threshold variable lies between these two values (Group 2 = 8 countries), there is no evidence for this significant relationship, owing to the low ratios of value added to the GDP by the service sector in Group 2 countries.

Brau *et al.* (2003) investigated whether tourism specialization is a good option for many less-developed countries and regions. They made a comparison of growth performance for 14 tourism countries within a sample of 143 countries covering the period 1980–1995. The standard OLS cross-country growth regressions were included in their study. They found that the tourism countries showed significantly more rapid rates of growth in contrast to all the other countries in sample (OECD, Oil, LDC, and Small). On the other hand, Schubert *et al.* (2009) studied the impacts of international tourism demand on the economic growth of small tourism-dependent economies. They considered a large population of temporal optimizing agents as components of the dynamic model, and incorporated an AK technology (endogenous growth model) to present tourism production. The result of this model showed that the growth of tourism demand causes an increase in economic growth and trade.

Fayissa *et al.* (2008) explored the potential contribution of tourism to economic growth and development in Africa within a neoclassical framework, using panel data of 42 African countries over the period 1995–2004. They concluded that the receipts from the tourism sector significantly affected current levels of GDP. In addition, these receipts impact on the economic growth of sub-Saharan countries in the form of investment in physical and human capital. Consequently, the African economies could increase their short-run economic growth by strengthening strategies in their tourism industries.

3 The Curse of Tourism

3.1 Introduction

Tourism is an important sector of most countries' economies, and its significance will continue to increase (Goeldner and Brent Ritchie, 2012). Tourism bestows a number of social and economic benefits on the countries involved. Besides being a source of economic revenue, the process of cultural exchange between the host population and tourist visitors is often cited as a potential source of social benefits (Armenski *et al.*, 2011). In addition, tourism can be considered as a 'clean' industry as regards the environment, although many serious debates surround this issue (Cater and Goodall, 1992; Jenner and Smith, 1992; Croall, 1995; Hjalager, 1996; Kreag 2011; Bastola 2012).

The economic effects are amongst the most tangible outcomes of tourism, since the economic activity generated by tourism not only boosts the economy through an increase in foreign-exchange income but also helps to generate employment opportunities (Greffe, 1994; Briedenhann and Wickens, 2004; Ashley *et al.*, 2007; Zortuk 2009; Polat *et al.* 2010) and stimulate the level of economic activity in the country (Ivanov & Webster 2006; Lee and Chang, 2008). According to the WTTC, the world tourism industry accounted for 10 per cent of the world's GDP in 2004 (WTTC 2013).

In spite of the aforementioned benefits of tourism, there is a possibility that tourism can also exert negative effects such as causing deterioration of the environment through the physical impact of tourist visits and leading to over-exploitation of natural resources (Capó *et al.*, 2007). Moreover, tourism can cause unwanted lifestyle changes that might have negative impacts on the traditions and customs of the host community (McLeod, 2006; Cooper *et al.*, 2008). Furthermore, recent studies have been investigating whether tourism causes the disruptive economic unbalancing phenomenon known as Dutch Disease, which is discussed at length in Section 2 below. Capó *et al.* (2007) found that there is evidence of Dutch Disease in two tourism-oriented island areas of Spain, namely the Balearics and the

Canary Islands. Their findings indicate that the economic growth of these regions might indeed be compromised by their high dependence on tourism.

The rest of this chapter is organized as follows. The next section will present a review of the literature on the relationship between economic growth and tourism; it also discusses Dutch Disease and the potential existence of Dutch-Disease effects in tourism-dependent economies. In Section 3 we describe the data, variables and methodology employed in this chapter. The empirical findings will be presented in Section 4, followed by concluding remarks in Section 5.

3.2 Literature Review

3.2.1 Tourism and Economic Growth

Many studies have investigated the relationship between tourism and economic growth in the recipient countries. A considerable number of studies that have examined the relationship by concentrating on a single recipient country have reported findings that indicate positive effects. For instance, Dritsakis (2004) has found long-term positive effects exerted by tourism on economic growth in Greece. Similarly, Balaguer & Cantavella-Jordá (2002) found support for their hypothesis of positive effects for Spain's economy. Studies on Turkey by Tosun (1999) and Guduz & Hatemi (2005) have also found empirical support for the tourism-led growth hypothesis. Other studies showing similar findings include that of Durbarry (2004) for Mauritius, Kim *et al.* (2006) for Taiwan, Mishra *et al.* (2011) for India, and Kadir & Karim (2012) for Malaysia. Moreover, Brau *et al.* (2003) discussed whether specializing in the tourism industry is a good option for less-developed countries and regions. They documented how tourism-specializing countries displayed significantly faster growth than any of the other sub-groups of countries within their sample (OECD, Oil, LDC, and Small Countries). In other words, the performance of tourism-specializing countries is positive, and is not apparently significantly based on the traditional variables of economic growth as put forth in the Mankiw-Romer-Weil model (Mankiw *et al.*, 1992). Tourism specialization appears to be an independent determinant.

To the contrary, however, Oh (2005) for (South) Korea, Payne and Mervar (2010) for Croatia, and Lee (2012) for Singapore, found no discernible link between tourism development and long-term economic growth. Figini and Vici (2009) conducted a cross-sectional analysis to investigate the relationship between tourism specialization and economic growth, and they concluded that tourism-based countries did *not* grow at a higher rate than non-tourism-based countries. In a panel analysis of African countries for the period 1995 to 2004, Fayissa *et al.* (2008) showed a positive relationship, with tourism receipts making a significant contribution to both GDP levels and general economic growth in sub-Saharan countries. A similar result was found by Eugenio-Martin *et al.* (2004) for a panel of Latin American countries from 1985 to 1998. Tourism is often viewed as an important engine of economic growth and development, especially for less-developed countries (Brida and Risso 2009; Tang and Tan 2013), helping to increase the economic welfare of local populations.

The discrepancies in these various findings might be explained by the choices made by the authors. Some studies suggest that certain variables are important regressors for explaining cross-country growth patterns and are more relevant than others (Sala-i-Martin 1997; Fernández *et al.*, 2001). Similarly, the samples selected by Brau *et al.* (2003) might not have been wholly representative. If such be the case, then the use of ordinary least squares coefficients (OLS) adopted by Brau *et al.* (2003) in their analysis might have been particularly susceptible to bias (Ray and Rivera-Batiz 2002).

3.2.2 Dutch Disease

The term 'Dutch Disease' was first introduced by *The Economist* (1977) describing the way in which the manufacturing sector in the Netherlands had gone into decline after the discovery of a large field of natural gas in 1959. Exploitation and exports of natural resources (in this case, gas) led to a considerable appreciation in the value of the Netherlands *guilder*, and this in turn made that country's manufactured and value-added exports less competitive internationally. An increase in the revenues from natural resources pushes the value of a nation's currency higher relative to that of other countries. Dutch Disease is thus defined as the negative impact on an economy of foreign currency inflows, which leads to currency appreciation and to higher inflows of relatively cheap imports. In the longer term deindustrialization sets in owing to the difficulties encountered in selling the country's exports.

Corden and Neary (1982) developed the core model of Dutch Disease. The model comprised *one* non-traded goods sector (services, etc.) and *two* traded goods sectors, one of which is booming whilst the other is lagging. The booming sector usually arises from the exploitation of some natural mineral resource, typically petroleum and/or gas, although sufficient deposits of copper, gold and other precious metals can have the same effect. The lagging sector is almost always the manufacturing sector. Those industries that do not have any part in resource exploitation activities become uncompetitive and begin to atrophy. The condition is exacerbated by competition from similar industries operating in locations where labour costs are cheaper. Within the depressed sector of the country's economy, job losses and wage stagnation constitute the *push* factors that help to drive the internal migration of labour to the more active or booming sector, which also exerts the *pull* factors of job opportunities and (potentially) higher wages. Furthermore, the additional income provided by the resource boom generates an increase in spending in the economy and leads to further labour-force losses from the manufacturing sector to the non-tradable goods (*i.e.* the service) sector. When income from natural-resource exploitation begins to decline, a country can find itself burdened with a very uncompetitive and unproductive manufacturing sector that is not able to generate much-needed export revenue. The term 'Dutch Disease' soon became applied to cases of varying degrees of similarity; models were devised that drew inspiration from the original, especially regarding situations involving financial dependence on aid or other income not arising from trade or activity across the broader range of a country's economic sectors (e.g. Bruno and Sachs, 1982; Corden, 1984; Bandara, 1995; Rudd, 1996; Adenauer and Vagassky, 1998; Brahmbhatt *et al.*, 2010; Fielding, 2010; IMF, 2011; Rajan and Subramanian, 2011).

3.2.3 Dutch Disease and Tourism

The literature on the links between tourism and Dutch Disease argues that tourism can be compared to an export boom following the discovery of natural resources. In relation to tourism, this phenomenon is sometimes also called the ‘Beach Disease’ (Holzner 2010).

Capó *et al.* (2007) investigated whether tourism causes Dutch Disease in two different regions of Spain—the Balearics and the Canary Islands—both noted for the extremely high and long-standing incidence of tourism. They found that the tourist inflow boom of the 1960s induced a significant increase in wealth in Spain generally, whilst the increased focus on tourism and non-traded goods detracted from necessary attention to industry and agriculture at the local level in these two regions. Their study found that, whilst this change in production did lead to an increase in incomes, there is evidence that these two regions might not be able to maintain economic growth rates for much longer. The reduction in natural resources such as beaches or natural areas is not the sole driver of growth-decay. Rather, it is the heavy focus on the tourism sector that has led to the neglect of other sectors that might provide economic activity and employment during a recession in the tourism industry. The decline of the traditional sectors (manufacturing and agriculture) has deprived these tourism-dependent regions of much-needed economic diversity. The failure to introduce economic diversification into these regions could lead to their becoming mono-industrial areas whose populations might find it extremely difficult to gain competence in activities unconnected with tourism. The neglect of economic diversification, on-going education and training, combined with a lack of technological innovation at the local level are not only symptoms but also drivers of Dutch Disease for these regions.

Using a theoretical model, Chao *et al.* (2006) discussed the existence of Dutch Disease through a demand shock from a tourism boom using a dynamic framework, examining the impacts of tourism on capital accumulation, sectoral output and resident welfare in an open dynamic economy. The authors realized that the expansion of tourism causes an increase in revenue and improvement in trade as a result of price rises in non-traded commodities. Nevertheless, the rise in the price of goods transfers the exploitation of resources from the manufacturing sector to other sectors in the economy. Meanwhile, the demand for domestic capital declines, creating pressure on the manufacturing sector, which causes de-industrialization and leads to Dutch Disease. Thus, this model indicates that demand-induced Dutch Disease is likely to lead to a decline of the capital stock which in turn may cause a loss in resident welfare in the long-run, as a result of the existence of externality that impedes diversification in other economic sectors.

Also using a theoretical model, Nowak *et al.* (2004) investigated the impact of a tourism boom on structural adjustment, commodities, factor prices and welfare. Their analysis used a hybrid of the specific-factors Ricardo-Viner-Jones model (Jones, 1971) and the factor-endowment Heckscher-Ohlin model (Ethier, 1972; Jones, 1987) under the assumption of full employment. In this open economy, the terms of trade were given exogenously. Three sectors represented the economy in the model: a non-traded goods sector, an agricultural sector producing an exportable good, and a manufacturing sector producing an importable good. They found that a tourist boom may cause the immiserization of residents: that is, that they may be rendered poorer than before the tourism boom. Tourist consumption consists largely of non-traded goods and services. When a tourism boom occurs, there is first an immediate, local and favourable effect owing to increases in the relative price of such non-traded goods. However, in the longer term a negative effect is encountered owing to efficiency loss that occurs in the presence of increasing returns to scale in manufacturing. Whenever this negative effect outweighs the initially positive effect, immiserization is the result. In a different way, Nowak and Sahli (2007) examined the relation between Dutch Disease and coastal tourism in a small island economy, applying the general equilibrium model. They found that the boom of inbound tourism may cause a loss of welfare when tourism activities and products make intensive use of the coastal land.

Holzner (2005) examined whether Dutch Disease has an impact on the tourism sector in more than 100 countries. The results indicated a negative correlation between both real exchange rate variability/distortion and economic growth. In any case, the relationship between tourism and real exchange rate distortion is negative. One explanation given is that countries drawing high incomes from tourism tend to be more outward oriented. Tourism might generate high levels of final-goods imports, such as those to which tourists are accustomed in their countries of origin and for which they create a demand in the tourism host country. This effect would strengthen import lobbies and the advocates of trade liberalization.

In a similar later study, Holzner (2010) examined the impact of Dutch Disease on tourism-dependent countries. From the analysis of data over the period 1970 to 2007 covering 134 countries, the results showed that, when controlling for initial output level, physical capital and human capital, the countries with higher shares of tourism income in GDP enjoyed faster growth than other countries. His findings indicated that tourism-dependent countries do not face real-exchange-rate distortion and deindustrialization but higher-than-average economic growth rates. Investment in physical capital, such as transport infrastructure, is complementary to investment in tourism—higher economic growth, higher levels of investment and secondary school enrolment are associated with countries deriving high income from tourism. Furthermore, tourism-dependent countries are accompanied by low real exchange rate levels. The study employed cross-country and panel data analyses using the share of travel services exports in GDP as a proxy for tourism capital.

Taking an extreme case of a tourism-dependent economy, Mieiro *et al.* (2012) investigated the presence of Dutch Disease in Macau owing to gaming tourism. Since the 19th century, gaming tourism has played an important role in Macau's economy, but the 2002 liberalization of gaming provided the catalyst for the current gaming tourism boom in that country. Within a framework that takes this into account, impacts of selected tourism growth-indicators were tested econometrically to reveal the presence of Dutch Disease in Macau. Although the classic structural imbalances underlying Dutch Disease have been identified, Dutch Disease would only represent a serious economic problem to Macau if the territory were to lose its privileged gaming position. The authors thus propose ways of taking preventative measures to remedy such a future scenario by applying revenues from gaming tourism to build up sustainable development in educational and health investment.

3.3 The Curse of Tourism?

3.3.1 Data and Variables

In the present study, we include 133 countries depending on the availability of data. The analysis covers the period from 1995 to 2007. All variables and data were obtained from WDI online (World Bank 2013). We follow Figini and Vici (2009) who considered a broad sample and two smaller sub-samples on the basis of tourism specialization defined as the share of international tourism receipts in the GDP. Accordingly, we apply the term "tourism countries" to those countries in which the revenue from tourism as a share of GDP is greater than the average (5.72 per cent) over the period 1995–2007, while the term "non-tourism countries" applies to those countries with the share of tourism revenue in GDP smaller than this.

To analyse the effect of tourism on economic growth, we have studied certain variables (listed in Table 3.1) that are commonly accepted in the economic growth literature as being robust determinants of growth. The dependent variable is the growth of GDP per capita at constant prices, denoted as 'growth'. Tourism receipts as a share of GDP are calculated by using international tourism receipts as a percentage of exports multiplied by the ratio of exports of goods and services to GDP. The general government final consumption expenditure (GCE) is calculated as a percentage of GDP. Education, denoted as 'school', measures the share of population in secondary education. We use this variable as a proxy for investment in human capital. Gross fixed capital formation as a share of GDP (here denoted as I) measures investment in physical capital. The variable 'trade', defined as exports-plus-imports as a share of GDP, is used as a proxy for the openness of the economy (Sequeira and Nunes 2008).

Table 3.1 Variables used in the present study

Denotation	Definition
growth	growth of GDP per capita at constant prices
GCE	general government final consumption expenditure is proxed to estimate the effect of government consumption on growth
I	gross fixed capital formation as percentage of GDP is used to measure the physical capital investment,
le	life expectancy at birth (total years) is used as a proxy of health
POP	annual population growth rate
school	school = percentage of relevant-age population enrolled in secondary school is used as a proxy for human capital
TRP	tourism receipts as a percentage of GDP is calculated using the international recipts of tourism exports and the ratio of exports of goods and services to GDP
trade	exports and imports of goods and services as a share of GDP is index to measure the impact of openness of the economy on growth performance,
ttradep	interaction variable (tourism as GDP share) × (trade)

In addition we have divided countries into two groups—developed and developing—on the basis of the UNDESA WESP classification (UNDESA, 2014). This distinction has been made to find whether tourism specialization helps under-developed countries to grow or not. Moreover, we have further divided countries into two groups on the basis of international receipts of exports. The two groups are: tourism-exporting countries whose receipts from tourism as a percentage of exports are greater than 8.90 per cent (the median share across all countries), and non-tourism-exporting countries for which this figure is less than 8.90 per cent (in addition, we also use the average share of tourism in exports, 14.14 per cent, as an alternative threshold). Finally, we created an interaction variable (denoted *ttradep*), obtained by multiplying the tourism share in GDP with trade in order to investigate the possible presence of Dutch Disease in tourism countries and non-tourism countries. Table 3.2 displays the relevant descriptive statistics.

Table 3.2 Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
GCE	1695	15.68838	5.778925	3.364233	39.19374
I	1670	21.78991	6.848701	3.480034	64.14175
POP	1724	1.336841	1.219802	–3.93064	10.04283
trade	1680	86.16208	49.27788	14.77247	456.6461
TRP	1647	5.726809	8.121327	0.018056	66.11868
growth	1592	2.900116	4.036521	–29.6301	33.03049
le	1688	67.82511	9.830611	31.23919	85.16341
school	1191	74.75916	31.5836	5.177891	161.6618

Table 3.3 Cross-correlation between variables, 1995-2007

	growth	trade	POP	I	GCE	TRP	school	le
growth	1							
trade	0.1076*	1						
POP	-.2523*	-.1426*	1					
I	0.2258*	0.2814*	-.1403*	1				
GCE	-.0823*	0.1632*	-.2038*	0.0701*	1			
TRP	0.0478	0.3834*	-0.04	0.2960*	0.1679*	1		
school	0.1193*	0.1790*	-.6184*	0.1292*	0.3898*	0.0586	1	
le	0.0285	0.0431	-.1456*	-0.0166	-0.0414	-0.1147	0.3308*	1

Table 3.3 reports the cross-correlation matrix of variables used in this study. For the consistency of the correlation matrix with the regression analysis. The correlation matrix shows that highest correlation within varaibles is investment then trade. However, coefficients between of the rest variables and economic growth are rather different in terms of magnitude and significance level.

Despite the large variation among the correlations reported in table 3.3, all coefficients are low and thereforemulticollinearity is not an issue here.

In addition, we provide the descriptive statistics in more details to show that standard deviation between and within (see appendix 9.1). However, we can notice from the table that covariates have relatively reasonable standard deviations, indicating that growth characteristics vary among over time and sample. Initially we applied fixed effect . However, fixed effect estimate is biased for data for which within-cluster variation is minimal or for variables that change slowly over time (Reyna,2007, p10). Therefore, in our analysis, we applied both random and fixed effects to check robustness of results. Afterwards, we applied hasuman statistic to test which model fit our data best. The hasuman test does not provide enough evidence to reject null hypothesis that fixed effect model fits the data better than random effect.

However, we are aware of the fact that there is less variation in some variables such as life expectancy within countries or across time variables. Therefore, we follow the theory to use these variables as index to measure human development. and then , we used school secondary variable for robustness check. We did not find a big difference in all estimations except for estimation in exporting and non-exporting countries., when we include the life expectancy tourism specialization affect economic growth positively. In order to show the variability we calculated the standard devotion and coefficients of variations by country code. (see 10.1 appendix)

3.3.2 An Empirical Model of Economic Growth with Tourism

The standard Solow model of growth assumes output to be the product of labor and capital, $Y=K^{\alpha}(AL)^{1-\alpha}$, where $0 < \alpha < 1$, K stands for the stock of physical capital, L represents labor and A is a catch-all parameter reflecting technological progress, quality of institutions and any other factors that increase output for given stocks of labor and capital. Mankiw, Romer and Weil (1992) use this basic formulation of the Solow model to derive a growth regression that can be estimated:

$$ln\frac{Y}{L} = a + gt + \frac{\alpha}{1-\alpha}\ln(s) + \frac{\alpha}{1-\alpha}\ln(\delta + n + g) + \varepsilon \quad \textbf{Eq. (3.1)}$$

where *s* is the savings rate, *n* is the rate of population growth, δ is the depreciation rate, *g* is the rate of technological progress, and ε is the error term; δ and *g* are not observed but their sum is proxied as 0.05. This growth regression can be further augmented to add additional factors of production: Mankiw et al. (1992) add human capital, and Li, Liu and Rebelo (1998) include also foreign direct investment. Many other conditioning variables have been proposed in the literature. The initial output per capita helps account for the fact that countries that are relatively poor tend to grow faster: it is easier to catch up than to lead. Government consumption can be included to account for the distortionary effects of taxation and the dead-weight loss of government spending (see Barro, 1991, and others). Openness to trade has been shown to make countries more productive, holding other determinants of growth constant (Sachs and Warner, 1995).[1] Given their nature, as factors of growth augmenting the productivity of labor and capital, most of these variables can be seen as falling within the term A in the above production function.

In our analysis, we build on this literature and include three basic factors of production, physical and human capital and labor; two productivity-augmenting parameters, government consumption and openness to trade, and our variable of interest, the share of tourism revenue in output. Therefore, we estimate the following baseline regression:

$$growth_{it} = \beta_0 + \beta_1 TRP_{it} + \beta_2 School_{it} + \beta_3 trade_{it} + \beta_4 I_{it} + \beta_5 GCE_{it} + \beta_6 POP_{it} + \beta_7 le_{it} + u_i + \varepsilon_{it} \quad \textbf{Eq. (3.2)}$$

[1] For a broad overview of these attempts, see Levine and Renelt (1992), and Sala-i-Martin (1997), and the subsequent replications of their assessments.

growth = the growth of GDP per capita at constant prices,

TRP = tourist receipts as a percentage of GDP,

school = percentage of relevant-age population enrolled in secondary school,

trade = total of exports and imports of goods and services as a share of GDP,

I = gross fixed capital formation as percentage of GDP,

GCE = general government final consumption expenditure,

POP = annual population growth rate,

le = life expectancy at birth (total years),

u_i = country-specific fixed effects,

ε_{it} = error term.

However, we have applied panel data in our investigation to estimate the parameters corresponding to variables of interest from the data under consideration. Thus, the usefulness of panel data models gives an estimation of large sample properties and increases the degrees of freedom. Furthermore, the panel data allows the reduction of endogeneity as result of consideration of specific country effects, omitted variables, reverse casualty and measurement error Campos and Sequeira (2005).

Following Fayissa, Nsiah and Tadasse (2007) we consider the following panel data model with N cross-sectional units and T time periods:

$Y_{it} = X_{it}B_k + Z_{it}\ \delta + u_i + \varepsilon_{it}$ **Eq.(3.3)**

i = 1, 2, ...,N; t = 1, 2, ..., T

Where Y_{it} is the dependent value measuring the growth of GDP per capita in country i at year t in our study. While X_{it} is a vector of observable regressors of the explanatory variables (Gross fixed capital formation, Growth of Population, General government consumption, Trade, Education and Tourism receipts) for country i = 1, 2…, m and at time t= 1, 2, …,T. β is a vector of unknown coefficients on x, Z_i is the vector of variables which do not depend on time and are different just over individual countries, δ is the vector of coefficients on z, u_i is the individual-level effect. ε_{it} is the disturbance factor.

Under assumption the ui aren't correlated with ε_{it} whatever the u_i correlated or uncorrelated with the regressors in X_{it} and Z_{it}, Baum (2006). Therefore, the random effects models are shown when u_i are uncorrelated with regressors. However, the fixed effects models are known if the u_i are correlated with regressors.

If we assume each cross sectional unit has its own intercept over time and the time specific effects are not present, the one-way effect model is termed and the last model is often called the Least Squares Dummy Variables Model, Fayissa, Nsiah and Tadasse (2007). However, the LSDV model is charged with problems since this model infers an infinite number of parameters. To understand the FE model well, it can be removed the panel data averages.

In other way removes additive effects within group transformation (LSDV) from each side of (3.3).then the Equation (3.3) becomes as follows:

$$y_{it} - \overline{y}_i = (x_{it} - \overline{x}_i)\beta + (z_i - z_i)\delta + (u_i - u)_i + \varepsilon_{it} - \overline{\varepsilon}_i \qquad \textbf{Eq.(3.4)}$$

Where

$\overline{y_i} = (1/T)\sum_{t=1}^{T} y_{it}$, $\overline{x_i} = (1/T)\sum_{t=1}^{T} x_{it}$ and $\overline{\varepsilon_i} = (1/T)\sum_{t=1}^{T} \varepsilon_{it}$.

While u_i and z_i are panel data averages.

Then we get the Equation (3.5):

$$\widehat{y}_{it} = (\widehat{x}_{it})\beta + \widehat{\varepsilon}_{it}$$

Eq.(3.5)

The last equation presents the consistent estimator β by the OLS on within – transformed data. Then we can call this estimator $\widehat{\beta}_{FE}$. Moreover, the estimated coefficients of the FE models cannot be prejudiced because the fixed effects model controls all time-constant difference between individuals. On the other side, the FE models cannot be used to examine time- invariant causes of dependent variables(Reyna, 2007).

On the other hand, the random effects model specifies when the individual effects are assumed to be random and uncorrelated with the independent variables and overall disturbance term.

$$y_{it} = x_{it}\beta + z_i\delta + (u_i + \varepsilon_{it}) \quad \textbf{Eq.(3.6)}$$

Where $(u_i + \varepsilon_{it})$ is a compound error term and u_i are the individual effects. The RE models can include time invariant variables, and this is consider from the advantages of the RE model. But disadvantage of random effects is that we need to define the individual chrematistics which may or may not affect the predictor variables. The problem with this is that some variables may not be available, therefore leading to omitted variable bias in the model. (Reyna, p26. 2009).

To determine the validity of the model, we use the Hausman Specification Test which shows whether a random-effects or fixed-effects model is to be preferred. In other words, this test examines whether the u_i effects are correlated with the regressors, since the null hypothesis is that they are not. The Hausman Test supports the fixed-effects estimates, as will be seen in the discussion of the empirical results.

3.3.3 Empirical Results and Discussion

We first apply the fixed-effects model and the random-effects model to the broad sample. The results are reported in Table 3.3 below.

Table 3.4 Fixed and random effects with two different measures of human capital

	(fixed effects with school)	(random effects with school)	(fixed effects with le)	(random effects with le)
VARIABLES	growth	growth	growth	growth
GCE	–0.231***	–0.193***	–0.191***	–0.133***
	(0.0585)	(0.0337)	(0.0458)	(0.0269)
I	0.129***	0.139***	0.132***	0.127***
	(0.0290)	(0.0233)	(0.0242)	(0.0198)
POP	–1.004***	–0.946***	–0.489***	–0.691***
	(0.236)	(0.171)	(0.174)	(0.120)
TRP	–0.0735	–0.0265	0.0213	0.00362
	(0.0761)	(0.0257)	(0.0633)	(0.0221)
trade	0.0654***	0.0144***	0.0552***	0.0112***
	(0.0104)	(0.00455)	(0.00845)	(0.00341)
school	0.0717***	0.00799		
	(0.0171)	(0.00744)		
le			0.224***	0.0146
			(0.0631)	(0.0176)
Constant	–5.507***	2.600***	–16.37***	1.155
	(1.792)	(0.907)	(4.202)	(1.388)
Observations	1,018	1,018	1,455	1,455
R-squared	0.140		0.104	
Number of countrycode	131	131	132	132

Robust standard errors in parentheses*** p<0.01, ** p<0.05, * p<0.1

The results in Table 3.3 illustrate that both the fixed-effects and random-effects models suggest tourism specialization has no significant effect on economic growth. This result differs from the findings of Sequeira and Nunes (2008) and Arezki *et al.* (2009), which showed a positive impact of tourism on economic growth. The other explanatory variables (GCE, POP, I and trade) in both models have highly-significant effects on economic growth. Government consumption and population growth seem to be negatively related to economic growth, whilst investment and trade are positively related to economic growth: these findings are in line with the economic growth literature. We used the Hausman Specification Test to check between fixed-effects and random-effects models, as shown in Table 3.4. The Hausman Test rejects the null hypothesis in favour of the fixed-effects (FE) models at ($p<0.05$). Thus, the country-level individual effects are not correlated with the regressors. We therefore adopt the FE models for the next analysis, in which we estimate fixed effects between economic growth and other explanatory variables.

Table 3.5 Hausman Test with life expectancy

|	**Coefficients**			
	(b) fixed	(B) random	(b–B) Difference	sqrt(diag(V_b–V_B))
GCE	–0.3227108		–0.05688	0.036514
I	.1323041	.1279829	0.004321	0.013598
POP	–1.1859507		0.202132	0.125887
trade	.0552824	.0112166	0.044066	0.007705
TRP	.0213419	.0035112	0.017831	0.059048
le	.224322	.015698	0.208624	0.059438

chi2(6) = (b–B)'[(V_b–V_B)^(–1)](b–B) = 81.51 Prob>chi2 = 0.0000

Table 3.6 Hausman Test with secondary school

	Coefficients			
	(b)	(B)	(b–B)	sqrt(diag(V_b–V_B))
	fixed	random	Difference	S.E.
GCE	–0.23084	–0.19333	–0.03751	0.047879
I	0.128933	0.139141	–0.01021	0.017354
POP	–1.00429	–0.94621	–0.05809	0.162481
trade	0.065401	0.014389	0.051012	0.009334
TRP	–0.0735	–0.02653	–0.04697	0.071678
secschool	0.071651	0.007993	0.063658	0.015347

chi2(6) = (b-B)'[(V_b-V_B)^(-1)](b-B) 62.53 Prob>chi2 = 0.0000

Tourism is a part of a country's exports and our regressions include trade already. Therefore, we do a re-estimation of the regressions after removing tourism from trade: specifically, we subtract tourism as share of GDP from trade as share of GDP. The results are similar to those obtained previously. The effect of tourism remains insignificant. On the basis of this finding, we might conclude that tourism does not enhance economic growth. The full regression results are shown in Table 3.6 below.

Table 3.7 Effect of tourism on growth: Fixed-effects model after removing tourism from trade

	(3)	(4)
VARIABLES	growth	growth
GCE	–0.231**	–0.191**
	(0.0940)	(0.0783)
I	0.129**	0.132***
	(0.0581)	(0.0380)
POP	–1.004***	–0.489
	(0.374)	(0.332)
TRP	–0.00810	0.0765
	(0.113)	(0.0946)
school	0.0717***	
	(0.0244)	
le		0.224**
		(0.102)
Trade (net of tourism)	0.0654***	0.0552***
	(0.0144)	(0.0121)
Constant	–5.507**	–16.37**
	(2.781)	(6.470)
Observations	1,018	1,455
R-squared	0.140	0.104
Number of countrycode	131	132

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Next, we apply the fixed-effects estimator to the tourism-countries sample (tourism specialization >5.72). The findings are given in Table 3.7 below. We conclude from the results given in Table 3.7 that tourism again has no significant effect on economic growth even among countries that rely heavily on tourism. Tourism appears not to be an important factor for enhancing economic growth in this group. This contrasts with previous studies such as Chang *et al.* (2010).

Table 3.8 Effect of tourism on growth: Split samples depending on tourism share in GDP

	(T-countries)	(Non-T c's)	(T-countries)	(Non-T c's)
VARIABLES	growth	growth	growth	growth
GCE	–0.507***	–0.217**	–0.268***	–0.244***
	(0.124)	(0.106)	(0.0955)	(0.0855)
I	0.180***	0.0961	0.115***	0.141**
	(0.0498)	(0.0825)	(0.0378)	(0.0569)
POP	–1.462***	–0.592	–1.042***	–0.397
	(0.462)	(0.369)	(0.286)	(0.314)
TRP	–0.0757	–0.247	–0.0222	–0.199
	(0.125)	(0.272)	(0.0902)	(0.244)
trade	–0.000152	0.112***	0.0309	0.0780***
	(0.0191)	(0.0212)	(0.0203)	(0.0184)
school	0.0888***	0.0501*		
	(0.0309)	(0.0257)		
le			–0.103	0.234*
			(0.160)	(0.122)
Constant	3.539	–6.526**	10.01	–17.27**
	(4.136)	(3.202)	(11.30)	(7.206)
Observations	253	765	354	1,101
R-squared	0.212	0.150	0.105	0.113
Number of country code	43	107	47	111

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

[T = tourism; c's = countries]

Trade also has a non-significant relationship with economic growth in countries dependent on tourism. In addition, government consumption and population growth are highly significant and again affect growth negatively. These results might lead to the conclusion that tourism is not a good option for these countries and is not a factor fostering economic growth. Secondly, we look at the non-tourism-dependent countries (tourism specialization < 5.72) which form 75 per cent of the whole sample. The results with different proxies of human capital in

Table 3.7 indicate that again tourism appears statistically insignificant in enhancing economic growth. Consequently, we found that tourism is not associated with higher growth rates in countries that specialize in tourism. This result supports the findings by Sequeira and Campos (2005) and Figini and Vici (2009). Table 3.8 shows a comparison for developed and developing countries. We find that tourism does not affect growth in either group of countries.

Table 3.9 Fixed-effects estimator in sub-samples of developing and developed countries

	(**Developed c's growth**)	(**Developing c's growth**)	(**Developed c's growth** 3)	(**Developing c's growth**)
VARIABLES				
GCE	–0.446***	–0.227**	–0.250*	–0.190**
	(0.157)	(0.0976)	(0.137)	(0.0825)
I	0.101	0.119*	0.0971	0.132***
	(0.105)	(0.0635)	(0.0818)	(0.0425)
POP	–0.963	–0.965**	–0.907*	–0.328
	(0.945)	(0.404)	(0.453)	(0.375)
TRP	–0.364	–0.0836	–0.0448	–0.00228
	(0.334)	(0.122)	(0.109)	(0.107)
trade	0.0548***	0.0624***	0.0560***	0.0614***
	(0.0119)	(0.0202)	(0.0110)	(0.0193)
school	–0.00873	0.119***		
	(0.00951)	(0.0311)		
le			–0.323***	0.304***
			(0.0790)	(0.108)
Constant	6.641**	–7.239**	24.45***	–21.73***
	(2.946)	(2.838)	(6.045)	(6.718)
Observations	247	771	332	1,123
R-squared	0.271	0.144	0.265	0.105
Number of countrycode	28	103	29	103

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Finally, we turn to examine the existence of Dutch Disease. We introduce the term *ttradep*, which is an interaction term combining trade as a share of GDP multiplied by the tourism specialization coefficient. The results obtained after augmenting the regression with this new interaction term are given in Table 3.9 below. We notice that both tourism and trade now both have positive and significant impact on economic growth. Their interaction (*ttradep*) is significant and negatively related to growth. Hence, while tourism and trade each have a positive effect, the countries that rely heavily on both tend to experience lower growth.

Table 3.10 Fixed effects in whole sample with tourism-trade interaction (ttradep)

	(1)	(2)
VARIABLES	growth	growth
GCE	–0.251***	–0.221***
	(0.0942)	(0.0768)
I	0.129**	0.126***
	(0.0594)	(0.0374)
POP	–1.045***	–0.508
	(0.374)	(0.323)
TRP	0.224	0.303**
	(0.158)	(0.134)
trade	0.0833***	0.0716***
	(0.0161)	(0.0142)
school	0.0631***	
	(0.0232)	
ttradep	–0.201***	–0.209***
	(0.0584)	(0.0595)
le		0.213**
		(0.103)
Constant	–6.425**	–16.70**
	(2.801)	(6.571)
Observations	1,018	1,455
R-squared	0.148	0.112

Number of countrycode	131	132

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

This result thus suggests that Dutch Disease might appear in the broad sample in those countries where there is a focus on tourism essentially as a main factor of economic growth. Surprisingly, tourism specilaztion affects economic growth positively and significantly. This might mean that if the country has a good life expectancy , tourism specialization affects economic growth more than good education.

In Table 3.11 below, we therefore estimate again separate regressions for the tourism-dominated and non-tourism-dominated countries.

Tourism is the main component (if not the only one) of exports of the non-traded sector. Therefore, we first examine if Dutch Disease exists in tourism-dominated countries. The estimated coefficient of tourism is positive but insignificant (although it is close to being significant at the 10 per cent level). The effect of trade on growth is again positive and significant. The interaction term (*ttradep*) has again a negative effect on economic growth which is negative when we control for human capital using schooling. This means that tourism may be causing Dutch Disease in the countries focusing on tourism. This result might be due to the dependence of these countries on the exports of non-traded services: tourism. The foreign-currency receipts for these services would tend to cause the real exchange rate to appreciate, thus making the traded goods produced in the agriculture and manufacturing sectors less competitive in international markets. This suggests that the effect of tourism is negative in economies that are highly dependent on both exports and tourism.

In Table 3.10 below, we give in Columns 1 and 3 the results from again estimating separate regressions for the tourism-dominated and non-tourism-dominated countries. The estimated coefficient of tourism is positive but insignificant (although it is close to being significant at the 10 per cent level). The effect of trade on growth is again positive and significant. The interaction term (*ttradep*) has a significant effect on economic growth and is again negative. This means that tourism may be causing Dutch Disease in the countries focusing on tourism. This result might be due to the dependence of these countries on the export of non-traded services, *i.e.* tourism. The foreign-currency receipts for these services would tend to cause the real exchange rate to appreciate, thus making the traded goods produced in the agriculture and manufacturing sectors less competitive in international markets. This suggests that the effect of tourism is negative in economies that are highly dependent on exports in non-tourism-dominated countries; we find that tourism has an insignificant impact. Therefore, there is no relationship between tourism and economic growth. Moreover, the coefficient *ttradep* is insignificant. So, we can say there is no evidence of Dutch Disease in these countries. In addition, after clearing tourism GDP from trade in both sub-samples, the findings were as follows: firstly, tourism does have an effect on economic growth in tourism-exporting countries but does not have an effect in non-tourism-dominated countries. Secondly, the interaction term *ttradep* still has a significant effect on economic growth in tourism-dominated countries. This means tourism causes Dutch Disease in these countries but there is no evidence for this in non-tourism-dominated countries, as evidenced by the results given in Table 3.11

Table 3.3 Effect of tourism on growth depending on share of tourism in exports

VARIABLES	(tourism exporting countries)	(non-tourism exporting countries)	(tourism exporting countries)	(non-tourism exporting countries)	(tourism exporting countries)	(non-tourism exporting countries)	(tourism exporting countries)	(non-tourism exporting countries)
	Threshold: 8.9% (median tourism/exports)				Threshold: 14.14% (average tourism/exports)			
	growth	growth	growth	growth	growth	growth	growth	growth
GCE	–0.379**	–0.204	–0.166	–0.277***	–0.469***	–0.236**	–0.160	–0.279***
	(0.152)	(0.126)	(0.131)	(0.102)	(0.114)	(0.107)	(0.165)	(0.0866)
I	0.195***	0.0771	0.134***	0.143*	0.199***	0.0776	0.137***	0.122**
	(0.0438)	(0.114)	(0.0322)	(0.0722)	(0.0487)	(0.0843)	(0.0322)	(0.0542)
POP	–1.145***	–1.015	–0.411	–0.866	–1.080***	–0.976	–0.466	–0.639
	(0.392)	(1.091)	(0.387)	(0.587)	(0.391)	(0.857)	(0.429)	(0.442)
TRP	0.204	–0.164	0.335**	–0.628	0.0936	0.378	0.302**	0.0260
	(0.174)	(0.592)	(0.132)	(0.679)	(0.190)	(0.409)	(0.141)	(0.394)
trade	0.0621*	0.0970***	0.0780***	0.0678**	0.0229	0.0954***	0.0686**	0.0723***
	(0.0338)	(0.0328)	(0.0229)	(0.0268)	(0.0333)	(0.0238)	(0.0328)	(0.0220)
ttradep	–0.193**	–0.225	–0.227***	–0.00910	–0.108	–0.292	–0.203***	–0.123
	(0.0876)	(0.305)	(0.0526)	(0.279)	(0.0773)	(0.228)	(0.0613)	(0.210)
school	0.0353	0.0626*			0.0526	0.0576**		
	(0.0268)	(0.0364)			(0.0321)	(0.0285)		

le			0.0827	0.281**			0.0239	0.248**
			(0.120)	(0.130)			(0.163)	(0.125)
Constant	–1.663	–6.651	–9.734	–18.64**	1.985	–6.530*	–5.299	–17.34**
	(3.881)	(5.111)	(8.622)	(7.641)	(4.018)	(3.822)	(12.30)	(7.276)
Observations	509	509	731	724	333	685	485	970
R-squared	0.174	0.136	0.101	0.135	0.174	0.142	0.072	0.126
Number of countrycode	83	78	86	86	57	99	60	103

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

3.4 Concluding Remarks

In this study, we investigated the relationship between tourism and economic growth using annual data for 131 countries covering the period 1995 to 2007, by means of panel-data techniques. The fixed-effects model results suggest that tourism specialization has no significant effects on economic growth. The same results were obtained when we split the sample into underdeveloped and developed countries, as also into tourism-dependent and non-tourism-dependent countries.

After adding an interaction term combining tourism and trade, we find that Dutch Disease might be an issue in countries that have both high exposure to trade in general and to tourism in particular. We find the same pattern in the sub-sample of countries with above-average reliance on tourism but not in the sub-sample of countries that do not have more than an average degree of reliance on tourism. These findings might be due to the relative dependence of these countries on the exports of the non-traded sector (tourism) which, in the case of countries overly-dependent on tourism receipts, may contribute to the real appreciation of the exchange rate that thus undermines the competitiveness of the traded sector (typically agriculture and manufacturing). Therefore, those countries whose trade relies heavily on tourism might experience Dutch Disease. In other words, excessive dependence on tourism might not enhance economic growth. In addition, if the tourism-exporting countries were to continue to rely on tourism as the main export resource, this could well cause the decline of the traded sector in favour of the non-traded sector.

4 Tourism and its Determinates

4.1 Introduction

Tourism has become a crucial factor driving economic growth for a number of countries. Worldwide, tourism accounts for 6 percent of world exports and 30 percent of service exports (UNWTO, 2015a). Consequently it is important to understand the relevant determinants of tourism, both in general and as they are applicable to any particular country or distinct area that attracts, or aims to attract, tourists. Most authors focus primarily on demand factors such as the level of income, relative prices, and exchange rates—either of the host-country currency or of the currency normally used or preferred by tourists. Other factors can also play significant roles in attracting or repelling tourists; internal tensions (ethnic, economic or of another nature) as well as external conflicts, often have a negative impact on tourist arrivals (see Crouch, 1994 a,b; Eilat and Einav, 2004; Garín-Muñoz, 2009).

However, only a few authors have so far investigated the effects that local governance exerts upon tourism. The way in which local authorities deal with residents and visitors, the levels of efficiency that are perceived in the services that they deliver, the range of services that local authorities provide, their response to constant or incidental needs affecting infrastructure and other aspects of a locality, the perceived attitudes of local officials, the presence or absence of corruption, the levels of openness and accountability, and many other circumstances—all these impinge on what is known as the institutional quality of governance that exists in any particular tourism destination. Institutional quality and governance have significant impacts on tourism—both in attracting and retaining tourists. Therefore, it is important to study the interaction between governance and tourism, since different (and sometimes conflicting) groups seek to secure their favoured policy decisions in any particular locality (Dredge and Jenkins 2007), and the consequential effects of these can have significant repercussions upon the attractiveness of a locality for tourists.

The United States Agency for International Development (USAID, 2002), has defined good governance as a "complex system of interaction among structures, traditions, functions, and processes characterized by values of accountability, transparency, and participation. Such effective governance usually entails a need for appropriate institutions, decision-making rules and established practices" (Fayissa and Nsiah, 2010 p.2). Effective governance is a key prerequisite for making tourism sustainable and for laying the economic, socio-cultural and environmental foundations of sustainable development (Mowforth and Munt 2009). Whilst governance may in practice be effective, the perceived values as evidenced by the policies and actions of local authorities can also have an enhancing or deleterious effect.

The Internet has become a major platform for consumer use in comparative tourism decision-making (Alrashid, 2012). The variety of information which it provides has enhanced management and e-commerce operations in the tourism industry. This has been achieved through facilitating promotional advertising to consumers, offering a variety of tourism products and services, and presenting enhanced value to both providers and consumers irrespective of their cultural orientations, nationality, or geographical location (Alrashid, 2012). Estimates made from the available statistics indicate that a number in excess of 75 million travellers world-wide are successfully engaging the internet in the process of planning their tourism activities (Hvidt, 2011). In the search for information regarding tourism over the internet, the most frequently researched categories include details regarding planned destinations such as climate, security, travel and accommodation, and core tourist attraction features (Hvidt, 2013).

Many of the previous studies have focused only on specific countries or groups of countries, such as those in Africa (Naudé, 2005), or Asia-Pacific (Enright and Newton, 2005). This chapter seeks to identify those determinants that have the greatest impact on tourism (in terms of tourist arrivals) in a sample of 131 countries and in sub-samples that include developed and developing countries (with this categorization determined according to the IMF classification). Sub-samples are also formed based on the population, as classified by the World Bank (WB) in 2012. The determinants employed in the current research comprise economic, demographic, technological and political factors. In addition, we use governance indicators as a proxy for institutional quality (Rios-Morales *et al.*, 2011), applying principal component analysis (PCA). The six indicators of governance comprise accountability of power, political stability, the rule of law, regulatory quality, corruption, and government effectiveness. Our sample covers a total of 131 countries over the period 1995 to 2007. We have chosen these countries on the basis of the data that are available, and we have applied static and dynamic panel-data methodology in our analysis.

This chapter aims to make a contribution to the study of determinants of tourism by focusing on the quality of institutions and communications infrastructure. To the best of our knowledge, no-one has yet dealt with the issue as to whether host-country communications infrastructure and quality of institutions have any effect on the performance of the tourism sector. This chapter is organized as follows. Section 2 reviews the literature relating to previous studies concerning the determinants of tourist arrivals. Section 3 presents the data and variables used in the analysis. Section 4 describes the model specifications and the econometric methodology, whilst the conclusions are presented in Section 5.

4.2 Literature Review

In this section, we discuss the previous literature dealing with the main economic and non-economic determinants of tourist arrivals that can affect tourist flows and 'destination image'. This latter term refers to those attributes that make a specific location appealing as a potential destination to travellers. Potential visitors can be made aware of these through official publications in the public media, or by private circulation of information—and especially by means of 'word of mouth', with the social media becoming an increasingly important forum for this (Litvin *et al.*, 2008).

Whilst the circumstances of tourism destinations vary from place to place, the fact that the information given is accurate is more likely to exert a favourable impression on visitors (Batinić, 2013). The flexibility and ease with which web-pages can be corrected and/or updated makes the internet potentially the best source of information for prospective tourists. The internet thus has an important influence on the tourism industry through the facilities it provides for marketing, information, online booking, thus significantly impacting on the competition occurring among tourist destinations (Luo *et al.*, 2004; Buhalis *et al.*, 2011). Furthermore, in an exploration of the historic relationships between online interactions and performance, it was found that the European destinations offering online services have shown stronger performance in terms of arrivals and tourism revenue that has increased in line with the numbers of prospective tourists using those services (*Tourism Economics*, 2013).

Indeed, the communications infrastructure is becoming daily more important in the promotion of tourism destinations. The internet and social media are exerting an ever-increasing influence upon the choices and decisions of prospective tourists by making information easily available to them. The success of a particular tourism destination increasingly depends on how well it is marketed through the electronic media (Buhalis, 1998; Buhalis and Law, 2008; Romanazzi *et al.*, 2011). Indeed, where a tourism location has perhaps acquired a poor reputation, if an attractive and user-friendly online portal is made available it has the potential to help revive the fortunes of the location (Romanazzi *et al.*, 2011). Certainly, the internet and its associated social media are gaining in importance in the world of marketing as consumers take to internet forums to air their views (Bickart and Schindler, 2001; Hennig-Thurau *et al.*, 2004). So whilst increasing numbers of prospective tourists use the internet for their research and planning purposes (Cai *et al.*, 2004; Parra-López *et al.*, 2011; Fotis *et al.*, 2012), many tourists are also posting feedback regarding their experiences (Gretzel and Yoo, 2008; Litvin *et al.*, 2008; Xiang and Gretzel, 2010). Consumer feedback is therefore also growing in importance, especially as a considerable proportion of it tends to be negative (Shea *et al.*, 2004; Sen and Lerman, 2007).

Regarding tourism, the main positive image attributes include pleasantness of climate, inexpensiveness of goods and services, safety issues, and similarity (or otherwise) of local lifestyle of the place to be visited (Gearing *et al.*, 1974; Ritchie and Zins, 1978; Schmidt, 1979). Gearing *et al.* (1974) proposed destination-image measures consisting of eight factors: 1. accessibility, 2. attitude towards tourists, 3. infrastructure, 4. price levels, 5. shopping and commercial facilities, 6. natural beauty, 7. climate, and 8. cultural and social characteristics. Ritchie and Zins (1978) identified four 'features' of the cultural image of a destination: (a) aspects of daily life, (b) remnants of the past, (c) quality-of-life conditions, and (d) compatible work habits of the local population. In their study of convention tourism, Var and Quayson (1985) investigated the effect of host image on tourist arrivals and found two crucial factors: firstly, *accessibility*, or how close a convention venue is to the home base of a delegate; and, secondly, the *attractiveness* of the convention location.

Some authors have investigated the role and significance of the local transportation system in helping to improve destination image. The transportation system has been defined as the interaction between transport modes and all the means that support tourist movements entering into and departing from destinations, and moving around within the destinations (Prideaux, 2000). Studies by Khadaroo and Seetanah (2007, 2008) have indicated that the condition of the transport capital stock of a destination contributes directly (either positively or negatively) to its attractiveness, and the importance of transportation facilities subsists in the contribution that they make in adding value to the services offered to tourists and the experiences that tourists receive.

Getz (1993) applied the framework of destination image on bringing tourism to the old 'downtown' business districts of Niagara Falls in an area stretching across the border from Canada to the USA at one of the oldest and most frequented locations for border-crossing and tourism between the two countries. He found that to be attractive as a tourism business district, a place should have three aspects: core attraction, central business zones, and supporting services. Kim (1993) derived six features in terms of selection criteria for tourists: (a) cultural attractiveness; (b) clean climate; (c) quality of accommodation and relaxation programmes; (d) family-oriented amenities and safety; (e) accessibility and overall country reputation; and (f) entertainment and recreational opportunities. In the same fashion, Chen and Hsu (2000) found that travel costs, quality of restaurants, local lifestyle, no language restrictions, and availability of interesting places affect the choice of Korean tourists. Russo and van der Borg (2002) found that more attention should be paid to transportation facilities, access to information and quality of local human capital in order to enhance location attractiveness in the four European cities that they examined.

Most studies have focused on factors that—either separately or jointly—determine tourist arrivals. For instance, Naudé and Saayman (2005) analysed how sociological and economic indicators, together with openness and governance indicators, affect tourist flows to Africa. They found that the most important determinants of travel to Africa included political stability, tourism infrastructure, marketing and information, and the level of development in the destination. Dhariwal (2005) attempted to analyse certain determinants of international tourist arrivals in India using annual data from 1966 to 2000. The results indicated that socio-political factors such as communism, terrorism and Indo-Pakistan tensions, seriously threaten the Indian tourism industry. In addition, Cho (2010) studied the impact of non-economic factors on tourism demand in four different continents. He identified that people from different areas have different preferences when selecting their destination. For example, Europeans and Asians prefer to visit a destination for its cultural heritage, whilst Americans like to visit places where there are numerous social events available.

Görmüş and Göçer (2010) attempted to investigate the socio-economic determinants of international tourism demand in Turkey. They concluded that distance between the sending countries and Turkey negatively affects tourism demand. Meanwhile, the real income, relative prices, real exchange and trade value between Turkey and the sending countries play positive roles. Similarly, Ibrahim (2011) examined the main determinants of tourist flows to Egypt and showed that tourism in Egypt is very sensitive to price. He also showed that the real exchange rate and trade also have a significant impact, being related positively with tourist flows to Egypt. Zhang *et al.* (2009) developed the travel demand model for Thailand by performing a multiple-regression analysis. They showed that the factors that best explained and had the most effect on tourist flows to Thailand are the exchange rate, promotional budget, Asian financial crisis and SARS.

Furthermore, Proença and Soukiazis (2005) used a combination of time-series and cross-sectional data to estimate the demand function of tourism in Portugal, considering Spain, Germany, France and the UK as the basic tourists to Portugal. Their analysis showed that per-capita income is the most important determinant of tourism demand while accommodation capacity is a very important factor for tourism supply. Examining the importance of the tourism industry in Croatia, Škuflić and Štoković (2011) sought to assess the determinants of tourism demand by using the GLS regression method. Their study yielded the following results: (1) income is positively related to the demand for tourism; (2) an increase in the prices for accommodation tebds to decrease the demand for tourism products.

Some authors have studied the main determinants of tourist arrivals separately. For example, Keum (2010) and Fry *et al.* (2010) studied the effect of openness and economic factors on tourist arrivals. They found that there is a positive relationship between tourist flow and trade. Khan *et al.* (2005) and Khan (2006) showed theoretically that tourism might encourage international trade through tourists' purchase of food, souvenirs, transportation *et cetera* in a foreign country. Thus, tourism has the potential to encourage trade. Travel might also lead to increased international trade through business visitors starting up new ventures or government agents negotiating trade agreements (Khan, 2006). The converse also applies, international trade could encourage tourism; when trade exists between two countries, there is likely to be an increase in business travel between those countries (Khan, 2006). Some authors have sought to explain the relationship between tourism and trade empirically. Thus, Shan and Wilson (2001) found that there is a two-way causality that operates between international travel and trade in China.

Similarly, Santana-Gallego *et al.* (2007) found a long-term relationship between tourist flows and trade when applying causality techniques between trade and tourism for the OECD countries and the UK. In another study, on the relationship between international trade and tourism in small island regions, Santana-Gallego *et al.* (2011) found that their results suggest a long-term bidirectional relationship between tourism and trade, while the short-run link lies mainly in the trade generated by tourist arrivals. Al-Qudair (2004) focused on investigating the relationship between tourist arrivals in Islamic countries and different measures of trade—namely imports, exports and total trade. A long-term relationship was found between the number of tourists and trade in the cases of Benin, Egypt, Jordan, Syria and Tunisia, while the causality test indicated a unidirectional relationship between tourist flows and imports in the cases of Egypt, Syria and Malaysia.

In terms of major determinants affecting the number of tourists, the most common variables are income and price (Lim, 1997a, 1997b). In this regard, tourism is considered to be a normal good, so that, when people's incomes increase, they are better able and more likely to travel abroad. Moreover, there is evidence that international travellers are sensitive to price (Crouch, 1992). When Edwards (1995) studied the cost competitiveness of selected countries in the Asia-Pacific region he found that an increase in relative cost can be shown to result in a fall in market share in travel from every originating country. A decrease in relative cost is linked to an increase in market share (Dwyer *et al.*, 2000a, 2000b, 2000c). Regarding the economic environment, Han *et al.* (2006) found that price competitiveness is a very important factor that influences the decision-making of American tourists.

With regard to social factors, Gearing *et al.* (1974) and Schmidt (1979) considered social determinants to be important factors in destination image. Phakdisoth and Kim (2007) and Vietze (2008) explored whether good governance has a positive effect on tourism receipts per capita. Moreover, Eilat and Einav (2004) considered whether the political risk associated with a destination plays an important role in destination choice, for both developed and less-developed countries. They found that political risk is very important for tourism for both high- and low-GNP destinations. Daryaei *et al.* (2012) further explored the impact on the level of tourism exerted by good governance together with GDP growth, technology growth, the inflation rate as an indicator of economic infrastructure, and the improvement of education. Good governance includes accountability of power, political stability, the rule of law, regulatory quality, levels of corruption, and government effectiveness.

The results indicate that in both groups of countries improvements in the governance indicators were accompanied by positive effects on tourism.

Various studies have examined the impact of political events on tourists' destination choice (Hall and O'Sullivan, 1996; Sönmez, 1998; Seddighi *et al.*, 2001; Neumayer, 2004; Fielding and Shortland, 2010) since, as suggested by many policy makers, both safety and stability play an important role in attracting tourists. It is expected that an increase in political violence leads to a decrease in tourist arrivals, if not *immediately* then at least in the long run, even though certain localities appear to attract tourists *because* of conflict (Timothy *et al.*, 2004). Locations affected by high levels of political violence tend to have only a few unique characteristics, and these locations can be easily replaced by peaceful holiday destinations that have similar characteristics. The results confirm the belief that political violence affects tourist movements to affected countries and they also suggest that policy makers should be concerned about the negative effects of political violence not only within their own country but also within the wider region in which their country is situated (Ioannides and Apostolopoulos, 1999; Hitchcock and Putra, 2005; Issa and Altinay, 2006).

Additionally, a report by UNWTO (2013) shows how the 2008–2009 global economy crisis influenced the tourism sector. The crisis peaked in 2009, with a 12 percent decrease in international tourist arrivals. During 2009, international tourist arrivals decreased by 4 percent at global level, coupled with a 6 percent decline in tourism receipts. In the last quarter of 2009, international tourist arrivals recovered and their growth rate turned positive, as shown in Figure 4.1.

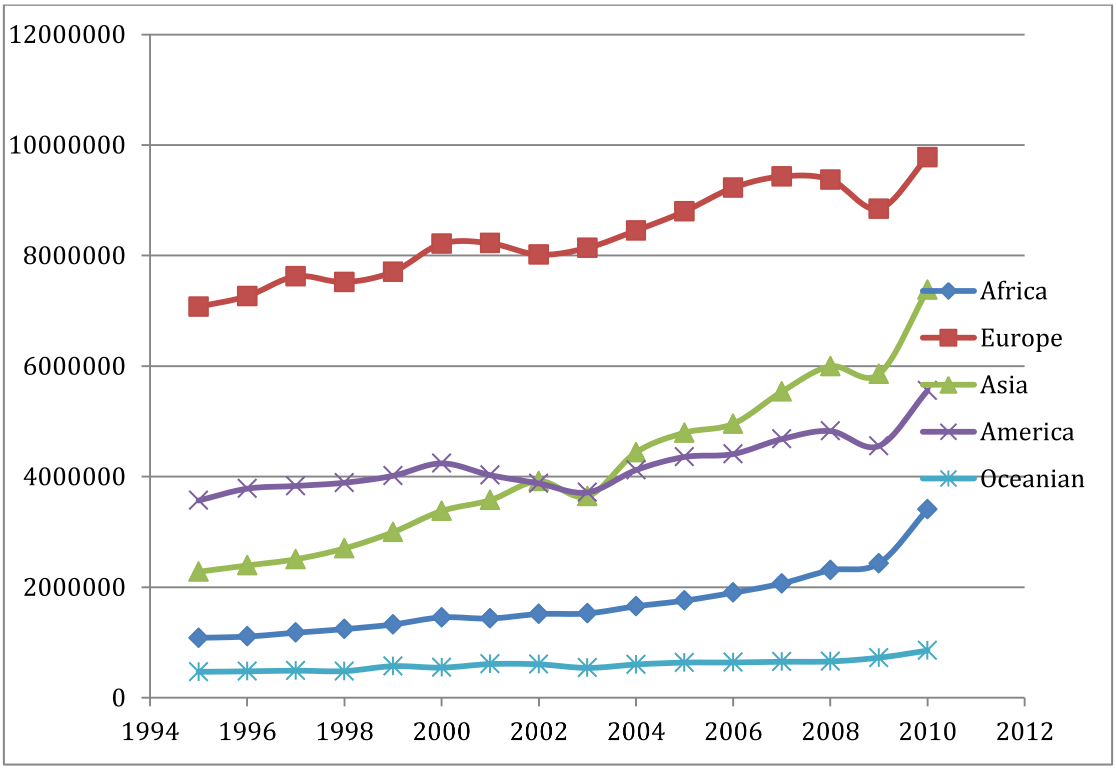

Figure 4.1 International tourist arrivals by region, Jan 1995–Mar 2010 (%)

Source: Author's calculations

4.3 Methodology

4.3.1 Data Set

The data used in this chapter were obtained from two main sources: the World Bank's World Development Indicators database (WDI, 2012), and the Central Intelligence Agency (CIA, 2012). The data cover the period between 1995 and 2007 for 131 countries. An attempt has been made to update the tourism arrivals data, but for most of the countries only the 2010 data are available. The dependent variable is the annual tourist arrivals.

The explanatory variables are:

- The growth of GDP per capita: we use the growth of GDP per capita in constant 2000 US dollars in the host country as our measure of economic growth, (see Ivanov and Webster, 2006). We expect a well-functioning economy to attract more tourists.
- Trade: used as proxy of openness and to check whether tourist arrivals are related to the economic interactions between the destination and its partners (see Song *et al.*, 2003; Ibrahim, 2011)
- Net/pop: the number of Internet users in a country for per 100 persons is used as a proxy to capture the effects of communication infrastructure on tourist flows
- Net/size: the number of Internet users in a country divided by the country's area is used as a proxy to capture the effects of communication infrastructure on tourist flows.
- Health: this variable is the percentage of health expenditure in GDP, and is used as a proxy for the health quality and public sanitary conditions (see Su and Lin, 2014).
- PPP: relative price variable which is normally used in demand models of tourism, for its likely impact on tourist's decision to travel or not.

Table 4.1 Explanatory Variables

Variable	Explanatory notes
Growth	Growth of GDP per capita constant 2000 USD (WDI, 2013)
Trade	The ratio of the sum of imports and exports to GDP (WDI, 2013)
Internet users /100 persons	The number of internet connections per 100 person (WDI, 2012)
Internet users/area square	The number of internet connections divided by the area of country (WDI, 2012) and size from CIA (2012)
Heath Expenditure	Total health expenditure is the sum of public and private health expenditure to GDP (WDI, 2012)
PPP	The relative price competitiveness of the destination measured by the ratio of GDP in PPP to GDP by market exchange rate in the destination countries. (Zhang and Jensen, 2007; WDI, 2012)

To find out how the quality of governance and institutions can impacts tourists' arrivals, we use the World Bank's World Governance Indicators (2007)—control of corruption (*COC*), voice and accountability (*voice*), rule of law (*LAW*), effectiveness of governance (*EOG*), and political stability (*PS*) (Vietze, 2009). The explanations of the governance indicators are given in Appendix 4.1 at the end of this chapter, where each indicator of governance is given in units of standard normal disturbance. These range from approximately –2.5 to 2.5. A higher value corresponds to better governance (Kaufmann *et al.*, 2002; Rios-Morales *et al.*, 2011).

Whilst using these indicators we found a strong significant correlation amongst them which can cause multi-colinearity problems. Therefore, we used Principal Component Analysis in order to counteract the strong correlation between these measures and to allow us to derive one or more summary measures ("principal components") from a set of indicators as explained in Table 4.2 below. We can see from table 4.2 that Component (1) explains 78.32 percent of the total variance. In addition, the Eigenvalue of Component 1 is higher than 1. Thus, if we wish to opt for a lower-dimensioned solution, we should keep Component 1 and we would then retain 78.32 percent of the variance in the original variables.

Table 4.2 Component Eigenvalues

Component	Eigenvalue	Difference	Proportion	Cumulative
Comp1	4.69898	4.22242	0.7832	0.7832
Comp2	0.476568	0.081584	0.0794	0.8626
Comp3	0.394984	0.179716	0.0658	0.9284
Comp4	0.215268	0.075	0.0359	0.9643
Comp5	0.140268	0.066342	0.0234	0.9877
Comp6	0.073926	.	0.0123	1

Source: Author's calculations applying PCA method

The advice indicated by the scree plot (see Figure 4.2.3 below) would be also to pick Component #1 because the elbow in the curve occurs at Component #2. This would suggest that one component accounts for a disproportionately large amount of the combined variance.

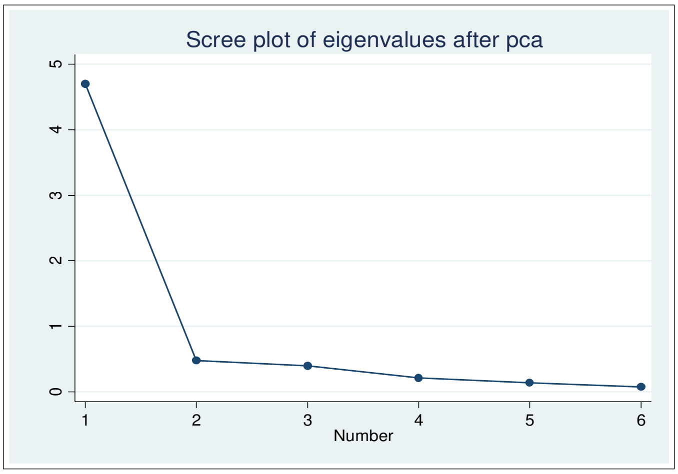

Figure 4.2 Eigenvalues

Accordingly, after applying the PCA statistical technique to the World Bank governance indicators, we chose the first component because it captures as much as possible of the original variance in these indicators.

there is a little variation in instaitiutaional quality and this could be because of the way that each of six aggregate WGI measures are constructed. WGI measures are made by averaging data from the underlying sources that correspond to the criteria of governance being considered. The six composite WGI measures are useful as a tool for broad cross-country comparisons and for evaluating broad trends over time. For a full description of the WGI methodology and interactive data access, to the aggregate and individual indicators, please visit www.govindicators.org (see appendix 9.2&10.3).

Next, by using data from the Uppsala Conflict Data Project (Gleditsch *et al.*, 2002), we examine whether armed violent conflict exerts an impact on tourism arrivals. The UCDP defines armed conflict as "a contested incompatibility that concerns government or territory or both, where the use of armed force between two parties results in at least 25 battle-related deaths. Of these two parties at least one is the government of a state" (Gleditsch *et al.*, 2002:619). The intensity of the conflict variable was coded into three categories, based on the criteria given in the UCDP/PRIO Armed Conflict Dataset Codebook (Version 4–2013, page 9).

0 = no conflict

1 = minor: between 25 and 999 battle-related deaths in a given year

2 = war: at least 1,000 battle-related deaths in a given year.

In addition, we divided our sample into two groups, and we classified the countries according to IMF criteria (we use the IMF classification to categorize countries as developed or developing, see Nielsen, 2011, Table 4) which are based on the levels of development as shown in Appendix 4.2. Moreover, we divided countries into samples according to the sample-median of population; Tables 4.3 and 4.4 present the descriptive statistics.

Table 4.3 Descriptive Statistics of Variables

Variable	Obs	Mean	Std. Dev.	Min	Max
netsize	1699	82.32184	439.5999	0	7936.984
GDPPER	1760	8042.055	11187.79	108.9024	67138.52
TOA	1680	5004512	1.04E+07	11000	8.09E+07
POP	1767	4.25E+07	1.45E+08	61700	1.32E+09
netpop	1699	13.99372	20.16298	0	88.90034
ppp	1728	0.574099	0.278601	0.140434	1.860173
Trade	1733	87.27659	51.59567	14.77247	438.9016
conflict	1767	0.160159	0.443702	0	2
healthEx	1722	6.219257	2.188463	0.137624	16.1524

Note: Values for descriptive statistics are in levels

Table 4.4 Descriptive Statistics of governance indicators

Variable	Obs	Mean	Std. Dev.	Min	Max
ps	1196	–.0196303	.9445767	–3.05644	1.57687
voice	1192	.1106886	.9278396	–1.95119	1.82669
reg	1186	.1648797	.9166428	–2.52663	2.02558
low	1191	.0784545	.9687808	–2.31285	1.96404
coc	1171	.1393674	1.020891	–2.48921	2.46656
eog	1179	.1403643	.9723042	–2.39408	2.23691

Note: Values for descriptive statistics are in levels

The table 4.5 perform a pairwise correlation analysis in this study; the degree of correlation varies among variables. The highest relationship is between tourism arrivals and population . in addition, the positive and significant correlation between tourism arrivals and institutional quality

Table 4.5 Cross-correlation between variables, 1995-2007

	TOA	POP	ppp	Trade	conflict	pca	health	netsize	netpop
TOA	1								
POP	0.3004	1							
ppp	0.3526	-0.0978	1						
Trade	-0.1339	-0.2039	0.1084	1					
conflict	-0.0219	0.1582	-0.2307	-0.2308	1				
pca	0.3171	-0.1164	0.8092	0.2773	-0.3051	1			
health	0.3584	-0.0999	0.541	-0.1138	-0.1784	0.4819	1		
netsize	0.033	-0.0149	0.1207	0.3297	-0.063	0.1253	-0.0775	1	
netpop	0.2768	-0.0765	0.7155	0.2456	-0.1893	0.7064	0.4648	0.206	1
GDPPER	0.3361	-0.0668	0.8601	0.216	-0.1687	0.7829	0.4691	0.2188	0.7376

4.3.2 Model specification and econometric method

The bulk of empirical research on tourist-arrivals modelling has focused on determinants of tourist-flows in separate countries or regions. In this study, the data from 131 countries are used jointly to find out which determinants have an effect upon tourist arrivals in a multi-country setting. In view of the challenges facing the tourism industry and the need to formulate policy advice for supporting the tourism sector, it seems more appropriate to identify the long-run determinants of tourist arrivals. We therefore use panel data approaches that give better estimates for long-run relationships (as explained by Kennedy, 2003, p 308). We have already discussed panel-data techniques in detail previously in this thesis.

4.3.2.1 Static Panel Data

Pooled *ordinary least square regression* (OLS) is employed at first because it yields a better understanding of the preliminary sign of each determinant of tourism flows (Su and Lin, 2014). This model assumes the pooled residual to be the sum of country-specific unobserved variables and the error term to be normally distributed. However, by omitting the unobserved variables, which may be correlated with other explanatory variables, the pooled OLS estimation with heteroskedasticity will cause severe problems of bias and inconsistency. To solve this problem, a panel-data model with fixed effects or random effects can be used.

The fixed-effects model assumes that each country has its own unobserved country-specific variables and estimates a separate constant term for each country, while the random-effects model assumes that unobserved country-specific variables follow a normal distribution, for which one overall constant term is estimated. We employed both models and used the Hausman test to determine which model performs better. The null hypothesis is that the random-effects model performs better than the fixed-effects model. The rejection of the null hypothesis means that the fixed-effects model is the one to be used.

Accordingly, the estimated model of tourist arrivals takes the following equation

$$ln\,TA_{i,t} = \beta_0 + \beta_1\, lnHealth_{i,t} + \beta_2\, \ln TRADE_{i,t} + \beta_3 \ln NX_{i,t} + \beta_3 conflict_{i,t} + \beta_5\, growthgdp_{\mathrm{i,t}} + \beta_6\, ln\,Ppp_{i,t} + \beta_7 ln\,PCA_{i,t} + \gamma_t + \mu_{i,t} + \varepsilon_{i,t}$$

Eq. (4.1)

Equation 4.1 shows that there is a relationship between the variables under study. However, we need to specify the functional form of the model practically, since there are several forms that can be used to determine the tourist flows.

It is appropriate to mention here that we did not take the logarithm of the PCA indicator—which is a composite measure combining the World Bank indicators—as this PCA indicator can be a negative number.

4.3.2.2 Dynamic Panel Data

In the previous section, we discussed the classical static panel-data techniques, namely OLS and fixed effects. These estimates are likely to be biased since the estimators ignore dynamic effects. The fixed-effect estimates might be affected by the biases caused by the explanatory variable X (endogeneity) and the correlation that might appear between the lagged dependent variable and the error term ($\boldsymbol{\varepsilon_{it}}$). To deal with this issue it has been recommended that the generalized method of moments (GMM) estimation method should be used (Arellano and Bond, 1991; Arellano and Bover, 1995; Blundell and Bond, 1998/2000).

We employ a dynamic panel model where the parameters are estimated using the generalized methods of moments (GMM) following (Greene, 2012). The GMM Model can be illustrated using the following equation.

$$y_{\mu} = \partial\, y_{t-1} + \beta x_t + \pi_i + \varepsilon_{it} \qquad \textbf{Eq. (4.2)}$$

There are two forms of GMM. One is known as the *Balestra–Nerlove* (1966) *estimator* , where the instruments for the lagged dependent variable are the current and lagged values of the exogenous variables. The second form of GMM is known as the *Arellano and Bond* (1991) *estimator*, where all the estimates are taken by applying the dependent variable as instruments, lagged by two and three periods to make the finite-sample biases less when we use too many instruments. The two-step

GMM would only be used to assess the validity of the model assuming that the second-order serial correlation does not exist.

Arellano and Bond (1991) proposed removing the individual effects through the first difference transformation as below:

$$y_t - y_{t-1} = \partial\,(y_{t-1} - y_{t-2}) + \beta\,(x_t - x_{t-1}) + (\epsilon_t - \varepsilon_{t-1}) \qquad \textbf{Eq. (4.3)}$$

Even though this transformation removes the individual specific effects, the regression model is still biased for two reasons; the first reason is that the bias comes from the high correlation of $\Delta y_{i,t-1}$ with $\Delta\varepsilon_{it}$, while the second reason is the possible existence of endogeneity in other explanatory variables.

So by following (Greene 2012; Mohammad Tajik,et al 2015, let us consider Δv_i as being a vector of errors for countries i in the first-difference model:

$$\Delta v_i = \begin{bmatrix} v_{i3} - v_{i2} \\ v_{i4} - v_{i3} \\ \vdots \\ v_{iT} - v_{iT} \end{bmatrix} = \begin{bmatrix} \Delta y_{i3} - \alpha\Delta y_{i2} \\ \Delta y_{i4} - \alpha\Delta y_{i3} \\ \vdots \\ \Delta y_{iT} - \alpha\Delta y_{iT} \end{bmatrix} \qquad \textbf{Eq. (4.4)}$$

Then let us consider the A_I as the matrix of instruments for variables i.

$$A_i = \begin{bmatrix} y_{i1} & & 0 & & 0 & & & 0 & \\ 0 & y_{i1} & & y_{i2} & 0 & & & 0 & \\ & & & & \ddots & & & & \\ 0 & & \cdots & & 0 & y_{i1} & y_{i2} & \cdots & y_{iT-2} \end{bmatrix} \qquad \textbf{Eq. (4.5)}$$

where the rows in Equation 4.5 are in correspondence with Equation 4.3.

The next equation (4.6) presents the orthogonality restrictions which give an initial requirements in estimating GMM model. This instrument matrix corresponds to the following moment conditions

$$E(A'_i \Delta v_i) = 0 \qquad \textbf{Eq. (4.6)}$$

where Equation 4.6 can be split into the two following equations,

$$E\left[y_{i,t-s}\,\Delta v_i\right] = 0, \quad t = 3, \dots, T \; and \; s > 2; \qquad \textbf{Eq. (4.6.1)}$$

$$E\left[x_{i,t-s}\,\Delta v_i\right] = 0, \quad t = 3, \dots, T \; and \; all \; s; \qquad \textbf{Eq. (4.6.2)}$$

Explanatory variables can easily be strictly exogenous or predetermined or endogenous (see Roodman, 2006). Therefore when the x is strictly exogenous then the instruments are

$$A_i = \begin{bmatrix} y_{i1}, x_{i1}, \ldots, x_{i4} & 0 \\ 0 & y_{i1}, y_{i2}, x_{i1}, \ldots, x_{i4} \end{bmatrix} \quad \textbf{Eq. (4.7)}$$

but in the case where x is predetermined

$$A_i = \begin{bmatrix} y_{i1}, x_{i1}, x_{i2} & 0 \\ 0 & y_{i1}, y_{i2}, x_{i1,}, x_{i2}, x_{i3} \end{bmatrix} \quad \textbf{Eq. (4.8)}$$

and when x is endogenous

$$Z_i = \begin{bmatrix} y_{i1}, x_{i1} & 0 \\ 0 & y_{i1}, y_{i2}, x_{i1}, x_{i2} \end{bmatrix} \quad \textbf{Eq. (4.9)}$$

Thus x_{it} are endogenous, $E(\nu_{it}|x_{it}) \neq 0$ and $E(\nu_{i,t-1}|x_{it-1}) \neq 0$. So, x_{is}(s=1,2,…,t-2) can be taken as a valid instrument, as $E(\nu_{it}|x_{i,t-2})$ = 0. In addition, when x_{it} are predetermined or weakly exogenous, x_{is}(s=1,2,…,t-1) can be applied as instrument, indicating that there is information from $\nu_{i,t-1}$ to x_{it} then $E(\nu_{i,t-1}|x_{it}) \neq 0$ but $E(\nu_{i,t-1}|x_{it-1}) = 0$.

Since it is difficult to find good instruments for variables, Arellano and Bond (1991) suggested the use of what is called an internal instrument, which is based on the lagged values of explanatory variables. Two assumptions are considered: the error term is not serially correlated and the explanatory variables are uncorrelated with future realization of the error term.

The GMM estimator uses the moment conditions mentioned earlier to estimate the parameters in two steps with consistency and efficiency. The one-step estimator minimizes:

$$J_N = (1/\, N \sum_{i=1}^{N} A_i^{`}\ \Delta V_i)^{`} w_N^{-1} (1/\, N \sum_{i=1}^{N} A_i^{`}\ \Delta V_i) \qquad \textbf{Eq. (4.10)}$$

where W_N is a weight matrix. The one-step GMM estimator uses the weight matrix, but the one-step estimator results are consistent and robust; standard errors and autocorrelation are easily derived.

Arellano and Bover (1995), and Blundell and Bond (1998/2000) then introduced the two-step GMM estimator, where the error term is assumed to be independent and homoskedastic across countries and over time (first step). In the second step, the residuals obtained from the first step are used to construct good estimates of the variance-covariance matrix. This two-step GMM is called the *difference GMM estimator*. The two-step GMM gives more general conditions, for example heteroskedasticity. Therefore, the weight matrix is calculated as,

$$W_N(\hat{\alpha}_1) = \frac{1}{N} \sum_{i=1}^{N} Z_i' \Delta\hat{v}_i \Delta\hat{v}_i' Z_i \qquad \textbf{Eq. (4.11)}$$

$$\Delta\hat{v}_i = \Delta y_i - \hat{\alpha}_1 \Delta y_{i,-1}$$

If the lagged dependent and explanatory variables are a random walk, their levels are considered weak instruments which might affect the asymptotic and small-sample performance of the difference estimator. The difference GMM estimator decreases the signal-to-noise ratio. Also, there is another assumption which needs to be accounted for, which is that there is no correlation between the differences of these variables and the country-specific effect.

Furthermore, Blundell and Bond (1998/2000) found out that the first-differenced GMM estimators might perform poorly if instruments are weak. When instruments are weak they become less informative, and the first-differenced GMM estimators suffer from finite sample-size distortion problems. To find the solution to this problem Blundell and Bond (1998/2000) suggested a new framework known as the system GMM, to estimate dynamic panel-data models by adding moment conditions if the intimal conditions satisfy

$$E(\eta_i \Delta y_{i2}) = 0 \qquad \textbf{Eq. (4.12)}$$

Therefore, the $T-2$ additional to the moment conditions for the model in the first difference is

$$(u_{it}\Delta y_{it-1}) = E\big((\eta_i + v_{it})\Delta y_{it-1}\big) = E\big((y_{it} - \alpha y_{it-1})\Delta y_{it-1}\big) = 0 \quad \textbf{Eq. (4.13)}$$

Let u_{it} be the vector of errors for individual i in the first-differenced and levels equation:

$$u_i^{+} = \begin{bmatrix} v_{i3} - v_{i2} \\ \vdots \\ v_{iT} - v_{iT-1} \\ \eta_i + v_{i3} \\ \vdots \\ \eta_i + v_{iT} \end{bmatrix} = \begin{bmatrix} \Delta y_{i3} - \Delta y_{i2} \\ \vdots \\ \Delta y_{iT} - \alpha \Delta y_{iT-1} \\ y_{i3} - \Delta y_{i2} \\ \vdots \\ y_{iT} - \Delta y_{iT-1} \end{bmatrix} \qquad \textbf{Eq. (4.14)}$$

and the Z_i^s matrix of instruments will be

$$Z_i^s = \begin{bmatrix} y_{i1} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & y_{i1}y_{i2} & 0 & 0 & 0 & 0 & 0 \\ & & \ddots & & & & \\ 0 & 0 & 0 & y_{i1}y_{i2} \cdots y_{iT-2} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & \Delta y_{i2} & 0 & 0 \\ & & & & & \ddots & \\ 0 & 0 & 0 & 0 & 0 & 0 & \Delta y_{iT-1} \end{bmatrix} \qquad \textbf{Eq. (4.15)}$$

$$E\big(Z_i^{s'} u_i^{+}\big) = 0$$

These are the System GMM estimator moment conditions, a total of moment conditions, used to estimate α by (linear) GMM.

Thus, the model of Blundell and Bond (1998/2000) is employed to obtain the dynamic panel model. Then the Windmeijer (2005) finite-sample correction is used for whole-sample correction to fix the standard errors of Blundell and Bond (1998/2000). Moreover, the consistency of GMM system depends on there being no second-orders serial correlation in the residuals (*m2* statistics). Therefore, the dynamic panel model is valid if the Estimator is consistent and the instruments are well defined. The presence of a good instrument variable leads to good GMM estimates. Two tests are suggested as well: the Arellano-Bond (1991) test of autocorrelation and the Sargan test of over-identifying restrictions (Sargan, 1958).

GMM is good for large N and small T samples, so we applied the method to the whole sample with *net/pop* or *net/size*, since the potential of endogeneity in tourism phenomena cannot be captured by static panel models (Khadaroo and Seetanah, 2008) and there are persistence effects that have influence on tourists' choices when they prepare for holidays.

Khadaroo and Seetanah (2008) state that tourists will return to a particular destination if they previously enjoy their stay in that locality. However, the discussion given above has not received much, if any, attention by authors.

Therefore, the dynamic framework will enrich the analysis and provide important aspects within the argument.Hence, the specific linear dynamic model hereby used for our estimation can be defined as,

$$y_{it} = a_0 + \sum_{k=1}^{p} a_0 \, Y_{it-k} + \sum_{j=1}^{q} \beta X_{it-j} + \eta_i + \lambda_t + \upsilon_{it} \qquad \textbf{Eq. (4.17)}$$

where *i=1,…,n* and *t=1,…,T*, and where y_{it} is the total number of tourists, Y_{it-k} represents the autoregressive structure to reflect habit/persistence in the tourist's choice of destination, and X_{it-j} are the current and lagged values of the matrix of regressors that could be strictly exogenous, or predetermined, or endogenous. Additionally, to capture the effect of common disturbances, υ_{it} is the error term, η_i represents individual effects, and λ_t represents time-specific effects.

4.4 Empirical Analysis and Results

Applying the static and dynamic panel data, we investigated the effect of PCA and communication infrastructure (net/size and net/pop) on international tourist flows whilst controlling other possible explanatory variables. Table 4.6 below shows the results of the estimation.

Table 4.6 static and dynamic panel results , in whole sample

VARIABLES	**(OlS)**	**(FE)**	**(RE)**	**(gmm) system)**
	logTOA	**logTOA**	**logTOA**	**logTOA**
L.logTOA				0.743***
				(0.0711)
dgdp	3.903	8.036***	7.042**	10.77***
	(5.682)	(2.987)	(2.938)	(2.724)
pca	0.322***	0.157***	0.205***	0.0702***
	(0.0239)	(0.0418)	(0.0353)	(0.0225)
lognetsize	0.085***	0.0744***	0.0818***	0.0181**
	(0.0123)	(0.0232)	(0.0148)	(0.00747)
loghealth	0.182**	0.00470	0.0250	0.0593
	(0.0870)	(0.175)	(0.165)	(0.0411)
logPOP	0.726***	0.962**	0.654***	0.185***
	(0.0156)	(0.480)	(0.0459)	(0.0527)
logTrade	0.852***	0.604***	0.658***	0.224***
	(0.0780)	(0.134)	(0.125)	(0.0759)
logppp	0.636***	0.599***	0.644***	0.226***
	(0.116)	(0.0916)	(0.0866)	(0.0662)
conflict	–0.218***	–0.102**	–0.105**	–0.0616
	(0.0786)	(0.0454)	(0.0503)	(0.0390)
Constant	–1.235**	–3.638	1.061	–0.288
	(0.568)	(7.989)	(1.206)	(0.265)
Observations	1,045	1,045	1,045	1,034
R–squared	0.739	0.551		
Number of countrycode	129	129	129	129
Number of instruments				22
AR(1) test, p.value				0
AR(2) test, p.value				0.431
Hansen test				0.185

The dependent variable is tourism arrivals. All models were estimated using the dynamic two-step system GMM estimator proposed by Blundell and Bond (1998) with Windmeijer's (2005) finite-sample correction. Robust standard errors in parentheses, significance: *** p<0.01, ** p<0.05, * p<0.1.

To determine the validity of the model, we use the Hausman Specification Test which shows whether a random-effects or fixed-effects model is to be preferred. In other words, this test examines whether the u_i effects are correlated with the regressors, since the null hypothesis is that they are not. The Hausman Test supports the fixed-effects estimates, as shown in Appendix 4.3 at the end of this chapter.

Moreover, the results from the Hansen test of over-identifying restrictions for the autocorrelation in the first-difference residuals show that that the instruments are valid for the regressions and that the null hypothesis of no serial correlation cannot be rejected. The results show a positive elasticity (10.77) of growth as expected in all estimations, indicating that the level of development of a country is the most significant of the variables having effect on tourism flows. For our main variables—institutional quality and communication infrastructure—the results of static and dynamic panel-data analysis show that both of these two variables have significant effect. However, the estimated fixed and GMM values of PCA elasticity, at 0.157 and 0.0702, are higher than health expenditure and internet users, which means that if the country exhibits good governance, it will attract more tourist arrivals. In summary, the empirical results strongly support the hypothesis that institutional quality and infrastructure play a large role in determining tourism flows.

Table 4.7 below shows the estimations results of different types of panel data, taking into account internet availability as a ratio to the area of the country (internet connections/country size) in the whole sample. The estimations for Table 4.6 also make use of population-weighted tourist inflows, in contrast to the use of overall tourist arrivals that was employed for the estimations shown in Table 4.5.

Table 4.7 static and dynamic panel data with internet users per kilometre squared in the whole sample

VARIABLES	(OLS)	(RE)	(FE)	(gmm
	logtoap	**logtoap**	**logtoap**	**logtoap**
L.logtoap				0.829***
				(0.0588)
lognetsize	0.0856***	0.0818***	0.0744***	0.0124**
	(0.0123)	(0.0148)	(0.0232)	(0.00594)
pca	0.322***	0.205***	0.157***	0.0427**
	(0.0239)	(0.0353)	(0.0418)	(0.0171)
logPOP	–0.274***	–0.346***	–0.0381	–0.0490***
	(0.0156)	(0.0459)	(0.480)	(0.0169)
logTrade	0.852***	0.658***	0.604***	0.146**
	(0.0780)	(0.125)	(0.134)	(0.0620)
loghealth	0.182**	0.0250	0.00470	0.0576*
	(0.0870)	(0.165)	(0.175)	(0.0321)
logppp	0.636***	0.644***	0.599***	0.143**
	(0.116)	(0.0866)	(0.0916)	(0.0622)
conflict	–0.218***	–0.105**	–0.102**	–0.0449
	(0.0786)	(0.0503)	(0.0454)	(0.0354)
dgdp	3.903	7.042**	8.036***	10.62***
	(5.682)	(2.938)	(2.987)	(2.663)
Constant	–1.235**	1.061	–3.638	–0.185
	(0.568)	(1.206)	(7.989)	(0.208)
Observations	1,045	1,045	1,045	1,034
R–squared	0.783		0.472	
Number of countrycode		129	129	129
Number of instruments				22
AR(1) test, p.value				0
AR(2) test, p.value				0.495
[illegible]				[illegible]

The dependent variable is tourism arrivals/pop. All models are estimated using the dynamic two-step system GMM estimator proposed by Blundell and Bond (1998) with Windmeijer's (2005) finite sample correction. Robust standard errors in parentheses, significance: *** p<0.01, ** p<0.05, * p<0.1.

We used population-weighted tourism inflows as the dependent variable in the calculations and we did not find any difference from the results given in Appendix 4.4. Next, we replaced internet connections divided by sthe area of the country by the ratio of internet connections per 100 persons. This modification has little effect on the results, as seen in Tables 4.8 and 4.9 below.

Table 4.8 Estimation with internet users per 100 people in whole sample

VARIABLES	**(OLS) logTOA**	**(FE) logTOA**	**(RE) logTOA**	**(gmmsystem) logTOA**
L.logTOA				0.825***
				(0.0670)
dgdp	0.965	8.036***	6.826**	9.122***
	(5.679)	(2.987)	(2.917)	(1.962)
loghealth	0.0645	0.00470	0.0193	0.0242
	(0.0801)	(0.175)	(0.164)	(0.0359)
logPOP	0.725***	1.036**	0.659***	0.124**
	(0.0151)	(0.461)	(0.0440)	(0.0500)
pca	0.297***	0.157***	0.210***	0.0462*
	(0.0240)	(0.0418)	(0.0344)	(0.0238)
lognetpop	0.161***	0.0744***	0.0843***	0.0260**
	(0.0158)	(0.0232)	(0.0153)	(0.0113)
logTrade	0.827***	0.604***	0.672***	0.131**
	(0.0677)	(0.134)	(0.123)	(0.0662)
logppp	0.562***	0.599***	0.653***	0.110***
	(0.114)	(0.0916)	(0.0869)	(0.0427)
conflict	–0.209***	–0.102**	–0.106**	–0.0275
	(0.0754)	(0.0454)	(0.0511)	(0.0232)
Constant	–1.076**	–4.851	0.903	–0.0760
	(0.512)	(7.667)	(1.167)	(0.238)
Observations	1,045	1,045	1,045	1,034
R–squared	0.751	0.551		
Number of countrycode		129	129	129
Number of instruments				32
AR(1) test, p.value				0
AR(2) test, p.value				0.495

Hansen test	0.1

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table 4.9 static and dynamic estimation results with net/pop in whole sample with dependent variable arrivals/pop

VARIABLES	(OLS) logtoap	(RE) logtoap	(FE) logtoap	(GMM) logtoap
L.logtoap				0.858***
				(0.0645)
lognetpop	0.161***	0.0744***	0.0843***	0.0214*
	(0.0158)	(0.0232)	(0.0153)	(0.0113)
pca	0.297***	0.157***	0.210***	0.0346*
	(0.0240)	(0.0418)	(0.0344)	(0.0205)
logPOP	–0.275***	0.0362	–0.341***	–0.0422**
	(0.0151)	(0.461)	(0.0440)	(0.0197)
logTrade	0.827***	0.604***	0.672***	0.105*
	(0.0677)	(0.134)	(0.123)	(0.0588)
loghealth	0.0645	0.00470	0.0193	0.0232
	(0.0801)	(0.175)	(0.164)	(0.0324)
logppp	0.562***	0.599***	0.653***	0.0923*
	(0.114)	(0.0916)	(0.0869)	(0.0519)
conflict	–0.209***	–0.102**	–0.106**	–0.0347
	(0.0754)	(0.0454)	(0.0511)	(0.0296)
dgdp	0.965	8.036***	6.826**	8.777***
	(5.679)	(2.987)	(2.917)	(2.304)
Constant	–1.076**	–4.851	0.903	–0.0381
	(0.512)	(7.667)	(1.167)	(0.197)
Observations	1,045	1,045	1,045	1,034
R-squared	0.793	0.472		
Number of countrycode		129	129	129
Number of instruments				28
AR(1) test, p.value				0
AR(2) test, p.value				0.401
Hansen test				0.0988

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Political violence has a negative impact on tourism flows. The results of the static panel estimations indicate that conflict causes damage to tourism by decreasing tourist arrivals. The effects of political violence could be different for developing countries and developed countries. To examine this question we split the whole sample into two groups according to the IMF classification.

The results of the Hausman Test shown in Appendices 4.5 and 4.6 at the end of this chapter, and in Table 4.11below showed preferences for applying fixed-effects rather than random-effects regression, so we report only the former.

Table 4.10 Fixed-effects regression: developed and developing countries

VARIABLES	**(whole sample)**	**(developed countries)**	**(developing)**	**(developed)**	**(developing)**
	logTOA	**logTOA**	**logTOA**	**logTOA**	**logTOA**
dgdp	8.036***	6.270	7.520**	6.270	7.520**
	(2.987)	(6.474)	(3.201)	(6.474)	(3.201)
Loghealth	0.00470	–0.0908	0.0635	–0.0908	0.0635
	(0.175)	(0.210)	(0.195)	(0.210)	(0.195)
logPOP	1.036**	–0.804	1.263**	–0.889	1.192**
	(0.461)	(0.581)	(0.536)	(0.590)	(0.558)
logTrade	0.604***	0.838***	0.579***	0.838***	0.579***
	(0.134)	(0.248)	(0.148)	(0.248)	(0.148)
pca	0.157***	0.145***	0.157***	0.145***	0.157***
	(0.0418)	(0.0510)	(0.0516)	(0.0510)	(0.0516)
lognetpop	0.0744***	0.0851***	0.0706***		
	(0.0232)	(0.0209)	(0.0264)		
logppp	0.599***	0.545***	0.632***	0.545***	0.632***
	(0.0916)	(0.106)	(0.114)	(0.106)	(0.114)
conflict	–0.102**	–0.0586	–0.0945*	–0.0586	–0.0945*
	(0.0454)	(0.0793)	(0.0486)	(0.0793)	(0.0486)

lognetsize				0.0851***	0.0706***
				(0.0209)	(0.0264)
Constant	–4.851	24.12**	–8.628	25.48***	–7.469
	(7.667)	(8.997)	(8.936)	(9.173)	(9.312)
Observations	1,045	274	771	274	771
R–squared	0.551	0.611	0.555	0.611	0.555
Number of countrycode	129	32	97	32	97

Robust standard errors in parentheses*** p<0.01, ** p<0.05, * p<0.1

We can see from Table 4.9 that our main variables *governance* and *infrastructure* (with *internet per 100 people* and *internet users divided by pop-size*) have a significant effect in both samples. The governance of a country is found to be important for the process of making destination choice, in respect of both developed and developing countries.

From the foregoing tables we see that there is no appreciable difference, except that with regard to the *conflict* variable, we can see that military conflicts have a detrimental impact on tourism arrivals in developing countries whereas no significant effect is observed in developed countries.

Regarding to results of estimation in subsamples, we applied fixed effects in favour of random effects according to husman test. Therefore,

In Table 4.10 we split the sample according to the median value of population. We define small countries as those with population below a threshold of 6,530,755 during the period 1995 to 2007. Armstrong *et al.* (1998) adopted a threshold of 3 million inhabitants, while the Commonwealth Secretariat and World Bank (CS/WB, 2000) adopted one of 1.5 million.

Table 4.11 Fixed-effects regression: countries with large and small populations

VARIABLES	(1) LC logTOA	(2) LC logTOA	(3) SC logTOA	(4) SC logTOA
dgdp	11.36***	11.36***	2.918	2.918
	(4.047)	(4.047)	(4.150)	(4.150)
loghealth	0.116	0.116	–0.206	–0.206
	(0.144)	(0.144)	(0.292)	(0.292)
logPOP	2.316**	2.337***	0.211	0.341
	(0.894)	(0.869)	(0.481)	(0.455)
logTrade	0.547***	0.547***	0.621***	0.621***
	(0.136)	(0.136)	(0.227)	(0.227)
pca	0.0890*	0.0890*	0.176***	0.176***
	(0.0449)	(0.0449)	(0.0544)	(0.0544)
lognetsize	0.0207		0.130***	
	(0.0274)		(0.0355)	
logppp	0.446***	0.446***	0.675***	0.675***
	(0.121)	(0.121)	(0.149)	(0.149)
conflict	–0.112**	–0.112**	–0.314***	–0.314***
	(0.0474)	(0.0474)	(0.0830)	(0.0830)
lognetpop		0.0207		0.130***
		(0.0274)		(0.0355)
Constant	–27.83*	–28.19*	8.043	6.129
	(15.51)	(15.06)	(7.936)	(7.534)
Observations	548	548	497	497
R–squared	0.608	0.608	0.570	0.570
Number of countrycode	68	68	65	65

Robust standard errors in parentheses*** p<0.01, ** p<0.05, * p<0.1

LC = countries with large populations> median 6,530,755);

SC = countries with small populations< median 6,530,755)

Table 4.12 Fixed effects of individual governance indicators

VARIABLES	(1) logTO	(2) logTOA	(3) logTOA	(4) logTOA	(5) logTOA	(6) logTOA
dgdp	8.944*	9.285***	9.712***	9.306***	8.740***	8.051***
	(2.893)	(2.955)	(2.917)	(2.926)	(3.014)	(3.023)
logPOP	0.880*	0.819*	0.891**	0.805*	0.786	0.948**
	(0.470)	(0.486)	(0.438)	(0.474)	(0.484)	(0.479)
logTrade	0.621*	0.625***	0.614***	0.627***	0.616***	0.611***
	(0.128)	(0.131)	(0.130)	(0.132)	(0.137)	(0.134)
logppp	0.617*	0.627***	0.607***	0.618***	0.649***	0.625***
	(0.0908	(0.0928)	(0.0904)	(0.0932)	(0.0926)	(0.0906)
loghealth	0.0189	0.0299	0.0559	0.0164	0.0357	0.0110
	(0.163)	(0.168)	(0.163)	(0.167)	(0.172)	(0.168)
lognetsize	0.0740	0.0719***	0.0747***	0.0756***	0.0747***	0.0700***
	(0.0217	(0.0219)	(0.0211)	(0.0220)	(0.0235)	(0.0227)
ps	0.129*					
	(0.0395					
conflict	–	–0.111***	–0.127***	–0.121***	–0.114***	–0.112***
	(0.0445	(0.0416)	(0.0416)	(0.0409)	(0.0406)	(0.0414)
voice		0.0867				
		(0.0853)				
reg			0.178**			
			(0.0896)			
law				0.112**		
				(0.0498)		
coc					0.116**	
					(0.0455)	
eog						0.137**
						(0.0633)
Constant	–2.370	–1.425	–2.628	–1.203	–0.860	–3.408
	(7.774)	(8.067)	(7.201)	(7.878)	(8.070)	(7.943)
Observations	1,078	1,074	1,068	1,073	1,057	1,064
R–squared	0.542	0.531	0.552	0.541	0.538	0.535
NOCC	130	130	130	130	129	130

Robust standard errors in parentheses*** p<0.01, ** p<0.05, * p<0.1

NOCC = Number of countrycode

Examining the results displayed in Table 4.11 above, we find that the effect of institutional quality on tourist arrivals is positive in both groups of countries, with the size of the effect being twice as large (and more strongly significant) in small countries. This is similar to the effect of communication infrastructure, which appears insignificant in large countries but positive and significant in small countries. Appendices 4.7 and 4.8 at the end of this chapter show the results of the Hausman Test. Accordingly, we applied the fixed-effects estimation to countries with high population-levels and the random-effects estimation to countries having small population-levels.

Finally, as a robustness check, we replaced the composite indicator of institutional quality (*pca*) with the individual governance indicators, to test how they influence tourist arrivals separately, the results being displayed in Table 4.11 above. As can be seen in Table 4.11 above, all the variables have the expected signs and most are statistically significant. All governance indicators variables are positive and significant except for *voice*. These results reveal that improved governance indicators generate positive effects on the impressions gained by tourists regarding the security and governance of a destination country. Thus, as far as institutional quality is concerned, the greater the number of countries oriented toward achieving and maintaining good institutional systems, the greater will be the fostering effect on global tourism performance. In other words, "good governance" is one of the most effective factors for improving and developing the global tourism sector. The establishing of good governance practices is well known to support governments to build a higher-visibility legal and institutional system that exhibits transparency in order to improve a country's image and thus attract more people to visit the country.

4.5 Conclusion

This study has sought to analyse the impact of the governance and communication infrastructure on tourism flows. We estimated the impact of six governance indicators (citizen voices and accountability, political stability and absence of violence, government effectiveness, regulatory quality, rule of law or state of law, and combating corruption) on tourism arrivals, using static and dynamic panel-data techniques in a sample of 131 counties during the period 1995 to 2003. We used the dynamic Generalized Method of Moments (GMM) of Blundell and Blond (1998/2000) to conclude that the significance of lagged dependent variables sheds light on persistence of tourist flows over time. A country can receive large numbers of tourists year after year, even if these tourists are always different people.

Our estimations clearly indicated that the effect of governance and internet connectivity is positive and highly significant for tourism flows. However, the question is obviously more complex. In addition, the positive relationships between communication infrastructure and tourist inflows in our estimated model appear to corroborate the idea that the increasing levels of networks (internet networks in the tourism industry) have generated beneficial effects for the industry.

We defined small countries as countries with median population of less than a threshold of 6,530,755 during 1995 to 2007, in order to identify those determinants that are the most important in having an impact on tourism (in terms of arrivals) in sub-samples taken on the basis of the median population size of sample countries. We found that good governance and infrastructure are key determinants of tourism flows in small population-level countries. Accessibility of internet networks is probably a key factor, with higher levels of population generating higher demand and more competition to internet access, which might put higher-population countries at a disadvantage with regard to accessibility per capita of population. It is also interesting that institutional quality barely affects tourism flows in the large-country sample. This might arise because governments in such countries are able to build up good institutional frameworks more effectively owing to a lower population growth-rate.

The sub-sample analysis made on the basis of the level of development current in a destination country highlights the fact that the governance of the host country is shown to be important for the process of destination choice, for both developed and developing countries. The positive relationship between the information technology variable and tourist flows shows that an increase in technological endowment tends to promote the growth of the tourism industry. However, some interesting differences arise between countries with regard to conflict. In developing countries particularly, violent events have a more profound effect on tourism arrivals than is the case for developed countries. Violent conflict is well known as acting to the detriment of economic growth in less-developed countries in the short-term at least (Murdoch and Sandler, 2002), and its negative impact on tourism can harm the economy as whole. An explanation for the fact that for developed countries the results tend to indicate negative and insignificant impacts of conflict can be found in relation to the very few military conflicts that the developed countries experience. Even when such events happen in developed countries, they are very often of a territorial nature and thus limited in spatial extent. Furthermore, toursist have tended to have greater confidence in the ability of developed countries to deal effectively with such problems.

The general level of development which is used as a proxy for technology in the present study is found to be the main universal factor behind explaining comparative advantage within tourism. In other words, “good governance” is one of the effective factors leading to improving and increasing tourism flows. Our results show that the technology proxy is an essential and comprehensive element for explaining the comparative advantage in the tourism industry. In addition, good quality of institutions is another of the most important factors that enhance tourism arrivals.

5 "International Tourism and Institutional Quality: Evidence from Gravity Model"

5.1 Introduction

Various scholars (Uysal and Crompton, 1984; Dwyer and Kim, 2003; Eilat and Einav, 2004; Naudé & Saayman, 2005; Song and Li, 2008; Culiuc, 2014) have conducted a series of studies analysing the determinants of tourist flows. In these studies, various techniques have been applied, including time-series data and panel data, as well as the gravity model (Prideaux, 2005). The gravity model concept was initially put forward by Tinbergen (1962) to explore flows of trade. The model was further developed and applied by Pöyhönen (1963). In its simplest form, it explains the trade flow between two countries by relating it to the economic mass of the two countries (using GDP as an indicator) and the distance between them. While the model was initially introduced as an empirical application, Anderson (1979) subsequently put forward a theoretical framework that supports this model.

Since tourism constitutes trade in services, authors began to use the gravity approach to analysing the movements of international travellers and tourists soon after the model first emerged (Heanue and Pyers, 1966; Pyers, 1966; Quandt and Baumol, 1966; Wilson, 1967; Quandt and Young, 1969; Gordon and Edwards, 1973; Malamud, 1973; Durden and Silberman, 1975; Kau and Sirmans, 1977; Kliman, 1981). Using approaches based on the gravity model, efforts have been made to explore and identify the determinants of tourism arrivals. As mentioned, GDP was the indicator originally employed in gravity models for measuring the economic mass of the areas, countries or regions under consideration. However, some authors, such as Taplin and Qiu (1997), have used population instead of GDP as the basic indicator of a country's "mass". A large volume of studies has been published investigating the most appropriate econometric specification models for tourism (Um and Crompton, 1990; Witt and Witt, 1995; Wong, 1997a, 1997b; Eilat and Einav, 2004; Wong *et al.*, 2006; Song *et al.*, 2009; Massidda and Etzo, 2012; Etzao *et al.*, 2013). Although there had been a tendency to neglect the gravity model in the more recent literature, it is coming back into use for modelling tourism demand particularly in the circumstances where there is a need to include and evaluate the role of structural factors (Morley *et al.*, 2014).

The gravity model is often operated on the basis of cross-sectional data, although this approach limits the analysis to a single time-period. Other researchers have used panel data instead of cross-sectional data to pass over this limitation of the model (Song, 2008). The application of panel-data estimation can help control for heterogeneity amongst countries. This makes it possible to employ fixed-effects or random-effects estimation methods, and also to apply classical estimation methods such as the traditional OLS (Mátyás 1997, 1998).

This chapter considers a panel-data set comprising 134 countries of origin and 31 destination countries (selected depending on data availability). We estimate the gravity equation using three techniques: OLS, Hausman-Taylor, and Poisson estimation techniques. We compare the performance of the three approaches in relation to the gravity-equation theory.

This chapter seeks to address the following questions:

- Do economic factors play a role in determining tourist flows?
- Do geographic factors in the origin and destination have an effect on tourism arrivals?
- Finally, the central question for this chapter is: How does institutional quality impact on tourism flows?

In order to answer the foregoing questions, this study employs the Gravity Model. At the outset it must be noted that, although many studies have used gravity equations as an instrument for the empirical modelling of tourism demand, the theoretical background to gravity modelling is still deficient in some aspects. Tourism-flows are movements of humans and not of merchandise. Tourists act as consumers when travelling for recreational purposes. Consumer demand and tastes often change suddenly. Humans as consumers often show a degree of randomness in behaviour that they might not normally display in other situations, particularly those related to work or business. Studies such as those by Turner and Witt (2001) and

Cohen *et al.* (2014) have described the difficulties imposed on the forecasting powers of models by unpredictable changes in consumer demand. Consequently, between tourism and trade there are bound to be considerable and highly noticeable differences that will be encountered in the mechanisms and patterns of international flows, simply because these flows involve two very disparate classes of items or entities.

In addition, there is no theoretical justification for incorporating policy instruments such as tourist taxes or promotional expenditures within the tourism gravity equation. Consequently, drawing inferences about the effects of tourism policies carries no guarantee of validity for the outcomes of such calculations.

The negative consequences that higher political risk poses for the tourism industry are highly important. To the best of our knowledge, there are no studies that investigate the effect of the quality of institutions on tourism flows. Accordingly this study has undertaken to examine the various effects of political instability (such as acts of terrorism, conflict, other forms of violence, and so forth) that exert negative effects on tourism. To this effect, we use data from the International Country Risk Guide (ICRG, 2012) to account for institutional quality and political risk in the countries of origin and destination alike, and to measure the effect of institutions on tourist flows.

This chapter is organized as follows. Section 2 reviews the literature relating to the determinants of tourist arrivals in the Gravity Model in general, as well as regarding the importance of political factors in particular. Section 3 presents the data and variables. Section 4 describes the model specifications, the econometric methodology and the results, whilst the conclusions are presented in Section 5.

5.2 Literature Review

The gravity model for international trade is studied by many authors (Anderson and wincoop, 2003). These researchers developed the framework of gravity to measure the bilateral trade and introduced the theoretical background of gravity equation in trade studies. Although there is a significant number of theoretical studies that support gravity trade model, there is a lack of studies supporting gravity tourism model. In addition, tourism bilateral data is not available as trade data.

Therefore, it's no surprise that gravity model for tourism was neglected in the literature. Keum (2010) identifies that gravity equation is valid to state the tourism arrivals by explaining different patterns of international tourism.

Consequently, in this study we tried to propose some theoretical background of tourism gravity supported by some empirical evidence with the data in hand because there is few authors have been interested mainly in applying gravity models to answer questions concerning politics, institutions and financial flow nexuses. Papaioannou (2009) reported that institutions exhibiting poor performance (for example, legal inefficiency) can act as a barrier to foreign bank capital flows. In addition, he suggested that the quality of institutions might be a key consideration in the process of bank lending rather than income or human capital. Likewise, Bénassy-Quéré *et al.* (2007) used the gravity model approach when they focused on the role that quality of institutions plays in the process of foreign direct investment (FDI) allocation in source and recipient countries. The results of their study suggested that higher levels of good institutional quality were correlated with increased levels of FDI in recipient countries. However, this correlation was not apparent in respect of source countries in general.

On the other hand, the gravity-model literature has emphasized the importance of institutional quality and political risk on trade. For instance, trade is significantly influenced by democracy (Milner and Kubota, 2005). According to Yu (2010) democratization affects trade in multiple ways. In particular, they concluded that a highly democratic country is likely to be an optimal actor in international trade owing to the likelihood of its exports being of a higher quality, and also because of the higher level of trust that trading partners are likely to give to such countries. Overall, they found robust evidence that hoigher levels of democratization are significantly reflected in increased levels of trade. In their study exploring the question of whether good institutions foster trade, Duc *et al*. (2008) adopted a gravity model that incorporated a Poisson Pseudo-Maximum Likelihood (PPML) estimator. Their results suggested that trade between open and democratic countries will in general (but not necessarily) tend to increase. Moreover, Moser *et al.* (2006) highlighted political risk as a "robust determinant" that impacts negatively on the flow of exports and international trade, and should be incorporated in empirical models of trade. A recent study by Mehchy *et al.* (2013) using gravity analysis examined the determinants of Syrian exports between 1995 and 2010. Their estimation indicated the importance of market size (measured by GDP) and population in attracting Syrian exports, whilst destination distance and the decline in Syrian institutional quality exert negative effects on Syrian exports. They listed the cultural similarities and trade agreements with Arab countries, with Turkey and with Europe that have previously played an effective role in determining Syrian exports. In addition, they clarified that changes in the nominal effective exchange rate did not affect Syrian exports significantly during the period 1995–2010. For the main conclusion of their study, they highlighted the decline in Syrian institutional performance as posing a grave threat to the Syrian export business and the national economy.

Many researchers have chosen to study tourism flows using the gravity-model approach. For example, Prideaux *et al.* (2003) explored the limitations of forecasting models in crisis situations. Prideaux (2005), combined a review of the existing literature with an analysis of tourist-flow data using gravity-model techniques to examine the structure of bilateral tourism and identified multiple categories of factors that may affect the overall size of tourism flows (see Table 1 in Prideaux, 2005). Archibald *et al*. (2008) employed a dynamic tourism gravity model to measure the competitiveness of Caribbean tourism markets. Khadaroo and Seetanah (2008) used a gravity model to investigate the role of transport infrastructure in attracting tourists. Keum (2010) explored the gravity equation to assess how well it can explain tourism flows, and he undertook a general survey and exposition of the patterns of international tourism flows. Zhang *et al.* (2015) used the gravity-model approach to investigate the impacts of cultural values on tourism. The empirical evidence gathered by these and other studies supports the basic validity and usefulness of the Gravity Model for describing the flow of tourism as well as trade. Studies such as these and the paper by Morley *et al.* (2014) demonstrate that, within certain defined limits, the applicability and robustness of the gravity-model approach are well established.

Lavallée (2005) applied a gravity model to assess the impact of the quality of governance in developing countries among 21 OECD countries. Lavallée's results show that if a developing country has good governance policy, this will help it to import goods from industrialized countries. Corruption has been defined that is "an act in which the power of public office is used for personal gain in a manner that contravenes the rules of the game" (Aidt, 2003:F632, citing Jain, 2001). It has been argued that corruption tends to adversely affect the health of an economy (Méon and Sekkat, 2005). According to Poprawe (2015) corruption has a negative effect on tourism. However, the effect of corruption on tourism may be twofold (Dutt and Traça, 2007). Evidence shows that corruption may facilitate business activity, thus increasing the speed or 'velocity' of money and hence the rapidity of transacting business. In this respect, corruption may sometimes have positive side-effects for tourists, who may make arrangements that might not have been forthcoming except through the payment of bribes or generous tips. However, where such payments become expected, non-payment can have the effect of causing problems for the unwitting touridst. In view of this, it is relevant to ask whether assessments of the quality of judicial and governance frameworks could be developed as indicators to be applied to the evaluation of the state of democracy and corruption in a locality. The further question arises as to whether such indicators are sufficiently robust with respect to newer developments. The impact of institutional behaviour and quality on trade certainly needs to be addressed (Dearden, 2000; Duc *et al*., 2008).

Furthermore, whilst tourism represents a vital contribution to economic development in many developing countries (Sinclair, 1998), however the developing countries have tended to represent the main locations of violence, often owing to conflicts over natural resources—access, ownership, and/or exploitation (Le Billon, 2001; Gleditsch *et al*., 2002; Piazza, 2006). Some writers have sought to study the effect of violence on tourism, since tourists are sensitive to the negative images that might be projected regarding any particular tourist destination (Neumayer, 2004). In fact, events of violence often have an impact on tourism not only contemporaneously, *i.e.* with immediate effect, but also with lagged, delayed effects. For example, the analysis by Enders *et al*. (1992) of the impact of terrorism on tourism in Spain and other western countries suggested that three to nine months could often pass before tourist arrivals decreased drastically. Countries whose image has suffered owing to violence often attempt by aggressive advertising campaigns to represent themselves as destinations that are wholly safe and secure for tourists (Sönmez *et al*., 1999), although these attempts may not be as effective as desired (Ahmed and Abdul-Kadir, 2013). The negative consequences of violence for the tourism industry are grave and highly important. However, the study-response has not been commensurate, as can be seen from the relative paucity of studies dealing with the impact of political violence on tourism. Accordingly, in this present chapter we have undertaken to examine the various diseases of political instability (such as acts of terrorism, revolution, armed conflict, other forms of violence, as well as the violation of personal integrity and rights) that have negative effects on tourism. More recently, Holder (2012) ran a model investigating the Arab Spring process. He found that in different countries, most of the outcomes depended on two factors: (a) the wealth of the dictator and (b) the provenance of the regime (either from a minority group, or from the majority). In addition, Cothran and Cothran (1998) have argued that political stability is crucial for developing Mexican tourism, even though certain tourists were attracted to Chiapas State to see the effects of the Zapatista uprising (Duffy, 2002). Archibald *et al.* (2008) showed that the importance of political stability as an indicator varies with regard to different destinations, with political stability as a consideration being more correlated to international tourists who travel from America and Europe.

Communications infrastructure and level of development are important factors for tourist destinations in all continents. Neumayer (2010) adopted a gravity approach to examine the influence of visa restrictions on tourists. His finding showed that such restrictions reduced the numbers of bilateral travellers by between 52 and 63 percent on average. The study by Lien *et al*. (2014) estimated the effects of Confucius Institutes on inbound travel to China, processing panel data in a gravity model and using the Poisson Pseudo-Maximum Likelihood (PPML) estimator. The authors established the usefulness of these institutes in boosting tourism inflows in general, and particularly the inflows of business and worker tourists. In two different studies Fourie and Santana-Gallego (2011, 2013) used standard gravity models to investigate tourism flows. In the 2011 study they explored the impact of mega-events (cultural, sporting) on normal tourist inflows into the host-country/region. In the 2013 study they compared the determinants that drive tourism arrivals inbound to Africa from outside and between African countries, using a standard gravity model of 175 origin/destination countries. In the latter study they found that the factors affecting African-inbound and African-internal tourism are quite similar to factors affecting global tourist flows, such as income, distance and land area.

Gil-Pareja *et al*. (2007a, 2007b) reported that common language, as well as the presence of embassies and consulates, are important factors attracting tourist arrivals from the G7 countries. In his study of the role of visas in determining cross-border travel, Tekleselassie (2014) found that GDP, population size, contiguity, common language, and previous colonial relationship also have a significant positive impact on cross-border travel. In addition, he found that geographical covariates such as distance and destination area negatively correlate with cross-border travel.

Karemera *et al*. (2000) used a gravity-model approach to demonstrate how the population of source-country and the income-level of recipient country are the main factors that determine migration to North America. The high-population countries of Asia and Latin America provided the great bulk of migrants, whilst domestic restrictions on political and civil freedoms in source countries restrict migration from these countries to North America.

Using an augmented gravity model that incorporated several measures for terrorism and similar violence, Nitsch and Schumacher (2004) investigated their effects on international trade. They identified terrorism as exogenous in their study and found that terrorism reduces trade, and a double increase would depress international trade by 4 percent. Similarly, Fratianni and Kang (2006) pointed out that terrorism tends to reduce trade flows by increasing trading costs and causing borders to become more rigid, particularly for countries that share a common land border.

Yap and Saha (2013) investigated the negative effects exerted on tourism by political instability, terrorism and corruption. Their analysis of panel data for 139 countries led them to find that political instability and terrorism both exert a negative effect on tourism arrivals, even within UNESCO heritage areas. However, they found that terrorism had less of an impact than political instability and corruption also has a negative effect. Thompson (2011) investigated how the effects of terrorism upon tourism differ in developed and in developing countries. His analysis indicated that the impact of terrorism on tourism in greater in developing countries than it is in more developed ones. He suggested that the difference might be explained by the cushioning effects of welfare resources and a greater diversity in the economy enjoyed by developed countries, which have greater resources to invest in the tourism market. Drakos and Kutan (2003) examined regional effects of terrorism on tourism in Greece, Turkey and Israel—countries having high tourism potential and trade. They analysed the various elements of the resultant effects of terrorist incidents, in order to identify similarities and dissimilarities in the impacts that terrorist actions exert upon tourism in the different countries. They documented the ways in which each country's share of the tourism market fluctuated in response to terrorist incidents. In this way they were able to map out the 'contagion effects' and the trends in how the patterns of tourist arrivals might shift from one country to another.

A clear insight into the mechanism that affects the tourism flows between two countries is most valuable for identifying inefficiencies and obstacles, the need for remedial actions, as well as potential development areas. Additionally it is useful to identify the elements causing unequal bilateral flows by investigating areas such as GDP level, size of population, and issues arising from destination competitiveness. More detailed research should be conducted by examining the suggested gravity framework for particular bilateral pairs in order to recognize the deficiencies and marketing potentials between such countries. Further analysis in this area could be performed for multinational tourism frameworks.

5.3 Data

This study uses tourist arrivals data from the UNWTO (2015b) dataset as the dependent variable. Following UNDESA (2008), the UNWTO defines 'tourist' as an overnight visitor, whereas 'visitor' refers to a broader concept, which includes both tourists and same-day visitors (excursionists, e.g. cruise passengers). A detailed review of tourism statistical concepts can be found in UNDESA (2008). The UNWTO takes great care to reconcile difference in national data collection on tourism to publish an annual summary of all tourism flows amongst countries. A set of macroeconomics indicators is drawn from the World Development Indicators published by the World Bank (2014). The gravity variables are provided by CEPII, including bilateral distance, and dummies for common culture and common borders (CEPII, 2014). Guiso *et al.* (2009) have indicated that the fact of sharing the same legal origin or background might reduce informational costs. In addition, we also include institutional quality.

For institutional data this study adopts the International Country Risk Guide's (ICRG) country risk composite score. The ICRG is the only agency to provide detailed monthly data for 140 developed, emerging and frontier markets, since December 2003 (Hoti *et al.*, 2005). The ICRG ratings contain 22 variables explaining three components of country risk—economic, financial and political—where 12 variables represent the political component, while 5 variables represent each of the economic and financial components of risk. The scores range from zero to 12, with higher scores representing lower risks (and thus more favourable institutional environment). Regarding the effect of institutional quality on tourism flows this study uses the following political-risk indexes (ICRG, 2014)[2]

(1) Government stability (GS)
(2) Military in politics (MP)
(3) Socioeconomic conditions (SC)
(4) Religion in politics (RP)
(5) Investment profile (IP)
(6) Law & order (LO)
(7) Internal conflict (IC)
(8) Ethnic tensions (ET)
(9) External conflict (EC)
(10) Democratic accountability (DA)
(11) Corruption (CC)
(12) Bureaucracy quality (BQ).

[2] ICRG Variables definitions were taken from the International Country Risk Guide (ICRG) and available at ttp://www.prsgroup.com/PDFS/icrgmethodology.pdf

The socioeconomic conditions (SC) composite refers to socioeconomic pressures in society caused by unemployment, consumer confidence, and poverty. The maximum score for SC is 12. Investment profile (IP, having a maximum score of 12) composite assesses the risks of expropriation, profit repatriation, and payment delays. Corruption (CC) assesses corrupt practices within the political system that undermine the security of foreign investment. Corruption may potentially distort the economic and financial environment, as well as reducing government and business efficiency when associated with the assumption of power through patronage rather by reason of competence. Actual corruption may also take the form of demands for special payments and bribes connected with import and export licenses, exchange controls, tax assessments, police protection, or loans. The maximum CC score is 6.

Democratic accountability (DA) is a measure of how responsive a government is to the opinions and desires of its population. The maximum score is 6. Bureaucracy quality (BQ, with a maximum score of 4) measures the resilience of a country's administration system, in other words how far the system has the strength and expertise to maintain day-to-day administrative functions without immediate drastic changes in policy or interruptions in delivering government services when a change occurs in the political complexion or identity of the ruling power in the government. Law & order (LO) assesses the resilience and impartiality of the legal system, as well as the extent to which popular observance of the law is maintained. The maximum LO score is 6.

Government stability (GS) measures the ability of a government to undertake its declared program and stay in office. Such ability is assessed through governmental unity, legislative strength and popular support. The degree of popularity of a government is indicated by the degree of the population's approval of its programmes and policies. The maximum GS score is 12. The ethnic tensions (ET) composite measures the degree of tension associated with divisions related to race, nationality, or language. The maximum score for ET is 6.

Internal conflict (IC) measures political violence and its impact on governance. High scores indicate that there is no armed or unruly civil opposition to the government, and also that the government does not indulge in arbitrary violence (directly or indirectly) against the population. The maximum score for IC is 12. External conflict (EC) measures the risk to the incumbent government of war, cross-border conflict, and foreign pressures. The maximum score for EC is 12. Religion in politics (RP) measures the domination of society and/or governance by a single religious group that seeks to replace civil law by religious law and to exclude other religions from the political and/or social process. The maximum score is 6. Military-in-politics (MP) assesses the degree of involvement of the armed forces in politics. Such involvement may diminish democracy or cause a threat to an elected civilian government. The maximum MP score is 6. Thus, with higher scores always give better performance.

Applying Principal Components Analysis (PCA), followed by a varimax rotation to summarize the indicators from the ICRG political-risk index, we then run the regressions using these newly-created variables to represent the institutional framework of a country. On standard eigenvalue-based criteria, whereby we have to choose eigenvalues greater than 1, we see from Table 0.1 that three components exceed a value of 1, between them explaining almost 71 percent of total variance. Table 5.1 lists the principal components.

Table 5.1 Principal components (eigenvectors)

Component	Eigenvalue	Difference	Proportion	Cumulative
Comp1	5.71942	4.11665	0.4766	0.4766
Comp2	1.60277	.4642	0.1336	0.6102
Comp3	1.13857	.216551	0.0949	0.7051
Comp4	.922017	.324344	0.0768	0.7819
Comp5	.597673	.158717	0.0498	0.8317
Comp6	.438956	.0365617	0.0366	0.8683
Comp7	.402394	.0577924	0.0335	0.9018
Comp8	.344602	.0903113	0.0287	0.9305
Comp9	.254290	.0224054	0.0212	0.9517
Comp10	.231885	.0290877	0.0193	0.9710
Comp11	.202797	.0581637	0.0169	0.9879

Comp12	.144634	0.0121	1.0000

Source: Author's calculations applying PCA method

The first component we called 'institutional quality', which was correlated with factor loadings associated with socio-economic conditions, bureaucracy quality (with factor-loading greater than 0.4), investment profile, corruption, law and order (greater than 0.3), and military-in-politics. The second component represents cultural conflict, as it is highly correlated with religious tensions, ethnic tensions, internal and external conflicts/tensions. The last component is associated with democratic accountability, with a negative value, and with government stability. Hence, we can say that the higher values indicate a greater degree of government stability, but a lower degree of democratic accountability. The relative distribution of the component loadings is shown in Figure 5.1.

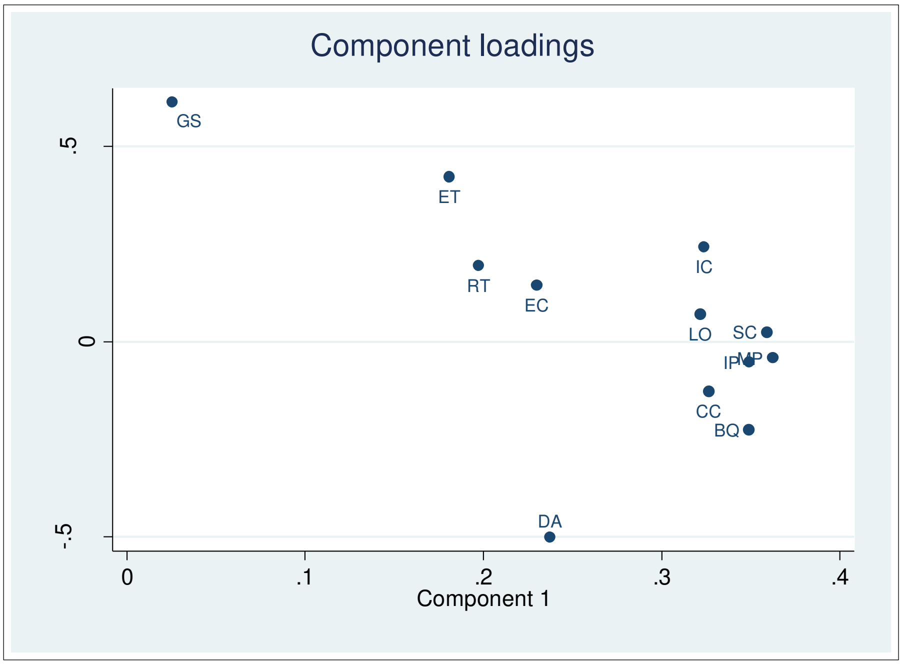

Figure 5.1 Component Loading factors

The scoring coefficients for the components are given in Table 5.2 below, whilst a summary of the variables used in the gravity model in this chapter is given in Table 5.3. The descriptive statistics of the political risks are displayed in Table 5.4, while Tables 5.5 and 5.6 show the specific values for destination and origin countries.

Table 5.7 gives the descriptive statistics for other explanatory variables used in the model.

Table 5.2 Scoring Coefficients

Variable	Comp1	Comp2	Comp3	Unexplained
GS	0.0952	–0.0018	0.7247	.214
SC	0.4272	–0.0440	0.1222	.1828
IP	0.3862	–0.0019	0.0025	.2705
IC	0.1749	0.4145	0.0784	.2554
EC	0.1311	0.2750	0.0348	.6413
CC	0.3986	–0.0906	–0.0331	.3126
MP	0.2932	0.2094	–0.1169	.2349
RT	–0.0911	0.6458	–0.1486	.2948
LO	0.3907	–0.0445	0.1689	.3152
ET	–0.0199	0.5196	0.1962	.4156
DA	0.1897	0.0439	–0.5721	.2092
BQ	0.4115	–0.0873	–0.1458	.1928

Table 5.3 Summary of variables used in the model

Variable	**Definition**
LnTR	Log of tourist arrivals to destination-country from the origin-country.
Gravity variables dgdpcapita	Log of gross domestic product per capita of the destination-country.
ogdpcapita	Log of gross domestic product per capita of the origin-country.
Dist	Log of the distance between countries in the pair as a proxy of transport costs.
Geographic variables contig	Dummy variable: both countries in the pair share a common land border.
Social variables comlang_off	Dummy variable: both countries in the pair have the same language.
dpop	Population size for destination-country.
opop	Population size for origin-country.
Comleg	Dummy variables: both countries have common legal features.
comco	Common colonizer between origin source of the tourist and host-country.
Economic variables comcur	Dummy variables: both countries have common currency
Political variables Pc1	The first component, called the institutional quality.
Pc2	The second component, called conflict culture.
Pc3	The third component, representing public accountability and government stability.

To explain tourist flows, the gravity variables population and income are appropriate (Llorca-Vivero ,2008).

In general, a destination's income and population.

Can be viewed as indicators of potential supply, and the origin's income and population as indicators of potential demand (Linnemann 1966).

With population density, (**pop**) it is possible, to measure to which the size of a country can affect the number of tourism arrivals.

While per capita GDP (**gdp**$_j$) it is possible to test the extent to which wealth can positively affect the amount of tourism generated by a particular region.

The distance between origin and destination (**dist**$_{i,j}$) is one of the baseline gravity variables and is measured in kilometers.

Tourism arrivals (**tourism**) are used to proxy international tourism demand.

Common border (**contig**) as a proxy of travel cost.

Colonial ties(**comco**) examine the importance of colonial ties for International tourism.

Regrading to ICRG variables ,

The first component **(pca1**)'institutional quality how better institutions motivate tourism arrivals according countries.

The second component represents (**pca2**) cultural conflict to examine the effect of conflict on tourism flows.

The last component (**pca3**)is associated with democratic accountability, with a negative value, and with government stability.

Table 5.4 Descriptive statistics of political risks

Variable	Obs.	Mean	Std. Dev.	Min.	Max.
GS	685	8.504234	1.545796	4	11.5
SC	685	5.809839	2.625996	0	11
IP	685	8.942642	2.435511	1	12
IC	685	9.426730	1.608478	2.92	12
EC	685	9.859445	1.392781	3.75	12
CC	685	2.563109	1.188127	0	6
RT	685	4.621737	1.268134	1	6
LO	685	3.785241	1.289555	0.5	6
ET	685	4.037299	1.213140	1	6
DA	685	4.153182	1.712098	0	6
BQ	685	2.177489	1.115947	0	4
MP	685	3.902526	1.718879	0	6

Source: Author's calculations

Table 5.5 Descriptive statistics of political risks of destination

Variable	N	Mean	Sd	Min.	Max.	p50
DGS	9965	8.104803	1.476566	5.08	11	8.04
DSC	9965	6.100653	2.28398	2	10.5	6
DIP	9965	9.333053	2.09101	4	12	9.5
DIC	9965	9.395184	1.333064	6.38	11.5	9.67
DEC	9965	9.882117	1.527061	5.38	12	10.33
DCC	9965	2.76312	1.04646	1	5.04	2.5
DMP	9965	4.039559	1.597821	0.5	6	4.5
DRP	9965	4.559708	1.310382	1	6	5
DLO	9965	3.705247	1.154911	2	6	3.5
DET	9965	3.570439	1.114916	1.5	6	3.5
DDA	9965	4.628722	1.292521	1.88	6	5
DBQ	9965	2.555822	1.040503	1	4	3

Source: Author's calculations

Table 5.6 Descriptive statistics of political risks of origin

Variable	N	Mean	Sd	Min.	Max.	p50
OGS	9965	8.403343	1.515168	4.04	11.5	8.38
OSC	9965	6.378509	2.588036	0	11	6.5
OIP	9965	9.386249	2.462021	1	12	9.58
OIC	9965	9.531137	1.59308	2.92	12	9.79
OEC	9965	9.948426	1.350924	3.75	12	10
OC	9965	2.8682	1.314398	0	6	2.5
OMP	9965	4.24556	1.670833	0	6	5
ORP	9965	4.673695	1.267304	1	6	5
OLO	9965	4.019797	1.327139	0.5	6	4
OET	9965	4.079863	1.175955	1	6	4
ODA	9965	4.485473	1.665108	0	6	5
OBQ	9965	2.49041	1.133055	0	4	2

Source: Author's calculations

Table 5.7 Descriptive statistics of other explanatory variables

Variable	Obs.	Mean	Std. Dev.	Min.	Max.
tourism	8208	164054.7	1115032	0	2.00e+07
odgdpcapita	9858	657850.4	2356413	275.453	2.40e+07
dgdpcapita	9907	262396.1	1139750	275.453	9200000
opop	9965	6.26e+07	1.88e+08	296734	1.30e+09
dpop	9965	4.78e+07	8.03e+07	329088	3.10e+08
dist	9965	7270.287	4211.778	111.0933	19711.86
contig	9965	.0361264	.1866141	0	1
comleg	9965	.3406924	.4739659	0	1
comcur	9965	.0200702	.1402477	0	1
comlang_off	9965	.185148	.3884371	0	1
comco	9965	.1063723	.308329	0	1

Source: Author's calculations

Table 5.8 Cross-correlation between tourism arrivals and the components analysis , 2005-2009

	tourism	dpc1	dpc2	dpc3	opc1	opc2	opc3
tourism	1						
dpc1	0.1051*	1					
dpc2	0.0287*	0.3748*	1				
dpc3	-.0438*	-.2047*	0.1571*	1			
opc1	0.1060*	-.0329*	-0.0046	-.0363*	1		
opc2	0.0380*	0.0057	0.0279*	-.0283*	0.5315*	1	
opc3	-.0463*	0.0424*	-.0424*	0.0207	-.1940*	-0.0057	1

From table above we can notice that highest positive significant correlation is between tourism and first component for both destination and origin, which presents institutional quality index. While there is a negative correlation between tourism arrivals and the third component.

Regarding the correlation between tourism and the rest of control variables, table 5.9 shows that various social, economic and demographical variables are correlated with tourism. The positive correlation of tourism and contiguity indicates that if two countries share same border there will be more bilateral tourism.. Moreover, the highest relationship is the negative correlation observed between distance and tourism as it is expected.

In addition, we can notice that there is a variation in most of variables while there is a little Variation in ICRG variables and this could be because of the way that each of 12 variables of political risk measures are constructed. Whereas, The Political Risk Rating includes 12 weighted variables covering both political and social attributes. (See appendix 9.3)For a full description of the ICRG methodology and interactive data access, to the aggregate and individual composites (see "International Country Risk Guide Methodology".)

Table 5.9 Cross-correlations between tourism and the rest of control variables, 2005-2009

	tourism	odgdpcapita	dgdpcapita	contig	comlang_off	comcol	conflict	comleg	comcur	dist	opop	dpop
tourism	1											
odgdpcapita	-0.0241*	1										
dgdpcapita	-0.0103	0.0092	1									
contig	0.4025*	0.0220*	-0.0073	1								
comlang_off	0.0391*	-0.0807*	-0.0731*	0.0877*	1							
comcol	-0.0125	-0.0546*	-0.0446*	0.0466*	0.2671*	1						
conflict	-0.0273	0.1874*	0.1862*	0.2960*	-0.094	.	1					
comleg	0.0574*	-0.0609*	-0.0242*	0.1332*	0.4369*	0.3701*	-0.0604	1				
comcur	0.2897*	-0.0385*	-0.0296*	0.1449*	-0.0037	-0.0378*	0.1894*	0.0708*	1			
dist	-0.1594*	0.0597*	0.0038	-0.2724*	0.0162	-0.0204*	-0.1095	0.0047	-0.1895*	1		
opop	0.0313*	0.0076	0.0355*	-0.0196	0.0383*	0.0139	-0.3064*	-0.0166	-0.0222*	0.1122*	1	
dpop	0.0855*	-0.0017	0.2737*	0.0299*	-0.0032	-0.1608*	-0.023	-0.0265*	0.0101	0.0808*	0.0059	1

5.4 Methodology[3]

5.4.1 Tradional gravity model :

The gravity model has been used with a great degree of success to explain a number of economic phenomena, including international trade, migration, commuting, FDI flows and tourism (Cheng and Wall, 2004, 2005).

The basic gravity function is specified as follows:

$$T_{odt} = K.\frac{M_o.M_d}{DISTANCE_{od}}$$ **(Eq. 5.1)**

where M_o and M_d are the *mass* (economic size) of the origin and of the destination respectively, and $DISTANCE_{\boldsymbol{od}}$ denotes the distance between the location of origin and the location of destination,

K is the proportionality constant, related to the frequency of the event. For example, if the same system of spatial interactions is considered, the value of ***K*** will be higher if the interaction were considered for one year, in comparison to the value of ***K*** if the interaction were considered for one week. Other authors (for instance Linnemann, 1966) include population as an additional measure of country size. ***o*** is used to index countries of origin, ***d*** to index countries of destination and ***t*** to index time. The dataset includes 134 origin countries and 31 destination countries (these numbers are determined by data availability), and the period under study is the decade 2005–2009. This yields 1993 country-pairs and 9965 observations in total.

After taking logs, the gravity model of tourism thus takes the following form (Culiuc, 2014 p. 10):

$$lnT_{odt} = B_1 lnY_{ot} + B_2 lnY_{dt} + B_3 lnD_{od} + B_A X_{odt} + \omega_o + \eta_t + \varepsilon_{odt} \qquad qt=1...T$$
(Eq. 5.2)

where T_{odt} is a measure of the tourism flow from country of origin *o* to destination *d* in year *t* while Y_{ot} and Y_{dt} are the gross domestic products per capita (measured in constant US$) of the origin- and destination-country respectively, D_{od} is the distance

[3] The following section is based on Santos Silva and Tenreyro (2006), Serlenga and Shin (2007), and Culiuc (2014).

between the two countries, $X_{odt}$is a $1 \times k$ vector of other variables proxying other factors; and η_t is a set of T year dummies capturing common time effects. However, the specification in Equation 5.2 suffers from omitted-variables bias as mentioned by Anderson and van Wincoop (2003) because it captures only the characteristics of *o* and *d*, without taking into account the reasons (the 'attractiveness') motivating the flows that occur from *o* to *d* as compared to flows going from *o* to other destinations. As bilateral flows are based on multilateral parameters, one way of dealing with the problem of multilateral parameters is to introduce dummies for origin countries and for destination countries.

The specification then becomes

$$lnT_{odt} = B_1 lnY_{ot} + B_2 lnY_{dt} + B_3 lnD_{od} + B_A X_{odt} + \omega_o + \delta_d + \eta_t + \varepsilon_{odt} \quad \textbf{(Eq. 5.3)}$$

in which $\omega_o \; and \; \delta_d$ are origin and destination dummy variables. But since there are time-invariant country variables such as geographical ones (distance, surface-area of country, *etcetera*) in the gravity equation, we are not able to estimate the coefficients of the mentioned variables. This problem can be addressed by using a fixed-effects approach where the panel variable is the country-pair. We introduce country-pair dummies φ_{od}:Therefore, the regression will be as follows:

$$lnT_{od} = \alpha + \beta_1 \ln POPt_{ot} + \beta_2 \ln POPt_{dt} + \beta_3 \ln GDPt_{ot} + \beta_4 \ln GDPt_{dt} - \beta_5 \ln Dist_{od} + \beta_6 \ln comleg_{od} + \beta_7 \ln contg_{od} + \beta_8 \ln comlang_{od} + \beta_8 \ln comcur_{od} + \beta_8 \ln comcolo_{od} + \varepsilon_{odt} + \eta_t + \varphi_{od} \quad \textbf{(Eq. 5.4)}$$

We introduce different fixed effects, first with time dummies are added to the regression, to account for the changing nature of the relationship over time. Then we run the regression associated with time-invariant origin and destination fixed effects and for time-varying origin and destination fixed effects. Finally, we present a specification where pair effects are also added.

5.4.2 Hausman Taylor model:

In addition, as an alternative to the country-pairs fixed effects models, Egger (2002, 2005) and Culiuc (2014) suggested using the Hausman-Taylor (1981) model (HTM). Whilst the HTM is being increasingly applied to gravity models of trade in goods, to the best of our knowledge it is only rarely applied in tourism studies. Therefore, the Hausman-Taylor (1981) estimator allows estimating coefficients on time-invariant variables by imposing assumptions on the endogeneity/exogeneity of each variable. Hence, the HTM estimator has advantages over the fixed- and random-effects models, since it depends on instrument variables used for between and within variation of the strictly exogenous variables (Egger, 2002, 2005). On the other hand, one of the disadvantages of the H-T estimator is to be found in the problem of how one defines the endogeneity and exogeneity of variables. In the literature, GDP per capita is highlighted as likely to be an endogenous variable. Therefore, we have made various alternative endogeneity assumptions in the regressions (discussed in greater detail below). According to H-T we can divide the explanatory variables into four categories: time varying (X_{it}^{1}) uncorrelated with individual effects α_{ti} and time varying (X_{it}^{2}) correlated with α_{i}, time-invariant (Z_{i}^{1}) uncorrelated with α_{ti} and time-invariant (Z_{i}^{2}) correlated with α_{ti} (Rault *et al.*, 2007) as follows:

$$Y_{it} = \beta_0 + \beta_1 X_{it}^{1} + \beta_2 X_{it}^{2} + Z_{i}^{1}\gamma_1 + Z_{i}^{2}\gamma_2 + \alpha_i + \theta_t + \eta_{it} \qquad \textbf{(Eq. 5.5)}$$

β_1 and β_2 are the coefficients for time-varying variables, γ_1 and γ_2 are the vectors of coefficients for time-invariant ones;

θ_t is the time-specific effect common to all units and is applied to correct the impact of all the individual invariant determinants.

α_i is the individual effects that account for the effects of all possible time-invariant factors.

η_{it} is a zero mean idiosyncratic random disturbance uncorrelated within cross-sectional units.

5.4.3 Poisson model

Westerlund and Wilhelmsson (2009) investigated the influence of applying gravity equation estimations on both simulated and real data. They found theoretically that, even when panel data are used, the presence of heteroskedasticity causes traditional estimations to become biased and inconsistent. Santos Silva and Tenreyro (2006) discussed how the logarithmic transformation of the model is also beset by difficulties in dealing with zero-trade flows. They suggested an alternative way for estimating log-linearized regressions that comes from direct estimation of the multiplicative form of the gravity equation, pointing out that this is the most natural procedure without the need of any further information on the pattern of heteroskedasticity.

The advantages of this model are that it deals with the zero-trade flows problem, it provides unbiased estimates in the presence of heteroskedasticity, all observations are weighted equally, and the mean is always positive. The disadvantage is that it may present limited-dependent variable bias when a significant part of the observations are censored (Santos Silva and Tenreyro, 2006; An and Puttitanun, 2009; Liu, 2009; Shepherd and Wilson, 2009; Siliverstovs and Schumacher, 2009; Westerlund and Wilhelmsson, 2009). Martínez-Zarzoso (2011) offers a cautionary view that has developed from an original paper (Martínez-Zarzoso *et al.*, 2007) that was highly critical of Santos Silva and Tenreyro (2006) and was in turn critiqued by them. The subsequent paper by Martínez-Zarzoso (2011) is much toned-down.

The cumulative distribution function of the standard Poisson probability model is expressed by

Prob(V=j)=$F_p(j) = e^{(-\lambda)\lambda j} / j!$ **(Eq. 5.6)**

with

$$\lambda = e^{\beta_0+\beta 1X1+\beta 2X2+\beta 3X3+\beta 4X4+\beta 5X5+\beta 6X6+\beta 7X7+\beta 8X8+\beta 9X9+\beta 10X10+\beta 11X11+\beta 12X12+\varepsilon}$$

where j denotes the possible values for tourism numbers (j=1,2…), $F_p(.)$ is the cumulative distribution function of the standard Poisson probability model, and λ is the non-negative Poisson parameter to be estimated (Greene, 2001; Bettin *et al.*, 2012), and the non-negative dependent variable. The volume of tourism flows is a count variable rather than a continuous variable.

Santos Silva and Tenreyro (2006) present the gravity equation in its exponential form:

$T_{ij} = \exp(x_{ij}\beta) + \varepsilon_{ij}$ **(Eq. 5.7)**

where T_{ij} represents the bilateral trade between country i and country *j*, and x_{ij} is a vector of explanatory variables some of which may be linear, some logarithmic, and some dummy variables. Therefore, we can introduce the PPML estimator as defined by Santos Silva and Tenreyro (2006) and Tenreyro (2007):

$\beta^{\sim}$=arg $min_b \ \sum_{i,j}^{n}[T_{ij} - exp(\, x_{ij}b]^2$ which is used to solve the following set of first-order conditions:

$$\sum_{i,j}^{n}[T_{ij} - exp(\, x_{ij}\, \beta^{\sim})] \exp(x_i B^{\sim}) \ \ x_i = 0 \qquad \textbf{(Eq. 5.8)}$$

We adopt the Santos Silva and Tenreyro (2006) specification to apply this estimator on cross-sectional data. However, this estimator has also been implemented in panel data environments.

For this application, from Equation 5.5 we can derive the expected value of the log-linearized equation, which would be:

$$E[TR_{odt} \,|z_{odt}] = \exp[\beta_0 + \beta_1 \ \ln(GDP_{ot}) + \beta_2 \ln(GDP_{dt}) \ + \beta_3 \ln POPt_{ot} + \beta_4 \ln POPt_{dt} - \beta_5 \ln Dist_{od} + \beta_6 \ln comleg_{od} + \beta_7 \ln contg_{od} + \ \beta_8 \ln comlang_{od} + \ \beta_8 \ln comcur_{od} + \beta_8 \ln comcolo_{od} + \beta_9\, PCA + \theta_o\delta_o + \theta_d\delta_d + \theta_t\delta_t\,) \text{ (Eq.5.9)}$$

$$z_{odt} = [\ln(GDP_{ot})\,, \ln(GDP_{dt}),\ \ln POPt_{ot}, \ln POPt_{dt}, \ln Dist_{od}, \ln comleg_{od}, \ln contg_{od}, \ln comlang_{od},\ \ln comcur_{od} + \ln comcolo_{od}, PCA + \delta_o + \delta_d + \delta_t\,]$$

As explained earlier, TR_{odt} represents the tourism arrivals from origin o to destination d for each year during the period 2005 to 2009, where

δ_o and δ_d are country specific fixed effects and δ_t is the year-specific fixed effect capturing the business cycle, while θ_o, θ_d and θ_t are vectors of the parameters with sets of fixed effects. We compare the results of log-linear regression, Hausman-Taylor and Poisson models, and focus on the gravity equation with an extended set of political-risk ICRG controls.

5.5 Empirical Results

5.5.1 Gravity variables as determinates of tourism flows

Three models have been applied in this study. Firstly, the OLS estimator is applied to three approaches to the Gravity Model: (a) the basic model, with *main variable of gravity model* for origin and destination countries (in our study it is *population*, as we are discussing tourist flows), together with distance; (b) an extended one with economic, geographical, social indicators; and (c) an extended gravity model with political controls in the country-pair sample for 134 “origin” and 31 “destination-host” countries during the 2005–2009 period with adjusted standard errors for heteroskedasticity. We start by using the OLS estimator for tourism.

5.5.2 Results from the OLS estimator

We began by comparing the basic and extended gravity models by adding some of the geographical, historical and linguistic dummy variables, such as *common colony*, *distance*, etcetera. Then an extended model was introduced with political-risk variables (three components) as given in Table 5.10.

Table 5.10 Basic and augmented Gravity Models

VARIABLES	(Traditional gravity) logtourism	(Extended gravity) logtourism	(Extended gravity with political risk) logtourism
logdist	–1.323***	–1.069***	–1.446***
	(0.0362)	(0.0359)	(0.0282)
logdpop	0.822***	0.777***	0.832***
	(0.0129)	(0.0137)	(0.00984)
logopop	0.565***	0.539***	0.828***
	(0.0157)	(0.0150)	(0.0120)
logdgdpcapita		0.202***	–0.0239*
		(0.0174)	(0.0120)
logogdpcapita		0.0634***	0.00685**
		(0.0115)	(0.00878)
contig		1.278***	1.601***
		(0.159)	(0.127)
comlang_off		0.959***	0.528***
		(0.0750)	(0.0504)
comcol		–0.644***	–0.00463
		(0.0965)	(0.0792)
comleg		–0.0982	0.401***
		(0.0685)	(0.0450)
comcur		3.197***	0.236**
		(0.149)	(0.0992)
dpc1			0.456***
			(0.0108)
dpc2			0.216***
			(0.0158)
dpc3			–0.188***
			(0.0223)
opc1			0.579***
			(0.0103)
opc2			0.199***

			(0.0168)
opc3			–0.236***
			(0.0160)
Constant	–3.747***	–3.463***	–8.415***
	(0.410)	(0.470)	(0.353)
Observations	8,208	8,078	8,078
R–squared	0.409	0.470	0.748

Robust standard errors in parentheses*** p<0.01, ** p<0.05, * p<0.1 No time or country fixed effects included

It can be seen from the first column in Table 5.8 that the basic variables of the gravity equation have strong effects on tourism flows. From pooled estimations, we find that the populations of origin and destination countries are a key determinant of tourism inflow in all three models. In addition, we notice that distance plays a substantial role on tourism flows, with increases in distance reducing tourist flows.

Next, we augment the basic gravity application by adding geographical variables such as contiguity, economic time-invariant variables such as common currency, and social variables such as common language (results given second column in Table 5.8), which revealed that *GDP per capita* for source and receipt countries is an important determinant in tourism demand. So, the demographic factors are considered as more important for tourism flows. Therefore, the coefficients of population indicate that larger countries receive and send more tourists. In addition, common border, common currency and language exert positive influences between the source-country and the host-country, while the colonial relationship is less important. However, regarding the question as to whether the political-risk factors are important and key in explaining tourism flows, we can see from the third column in Table 5.8 that institutional quality and conflict have an important influence on tourism flows. The higher levels of ICRG components indicate better quality of institutions and accordingly lower risk. Regarding the third component, higher values are associated with lower degrees of democratic accountability, and it indicates that this will exert a negative effect on inflows of tourists among the countries.

5.5.3 Estimation results of the gravity equation origin and destination effects using OLS regression

Table 511 below presents the results after controlling for origin and destination fixed effects. The table shows the estimation results for the theoretically-based augmented Gravity Model (the *Anderson–van Wincoop* 2003 *model*) which introduces time, origin and destination fixed effects.

Table 5.11 Estimation results of the gravity equation origin and destinations effects

VARIABLES	(or/de fixed effects) logtourism	(de fixed effects) logtourism	(or fixed effects) logtourism
logdist	–1.405***	–1.405***	–1.435***
	(0.0277)	(0.0303)	(0.0253)
logdpop	–0.0795	–0.308	0.848***
	(0.949)	(1.078)	(0.00810)
logopop	0.421	0.769***	0.643
	(0.535)	(0.0117)	(0.568)
logdgdpcapita	0.311	0.310	0.0219**
	(0.291)	(0.356)	(0.0109)
logogdpcapita	0.351	–0.00414	0.602*
	(0.338)	(0.00831)	(0.366)
contig	1.419***	1.440***	1.560***
	(0.127)	(0.127)	(0.126)
comlang_off	0.835***	0.650***	0.713***
	(0.0560)	(0.0522)	(0.0533)
comcol	0.173**	–0.165**	0.366***
	(0.0771)	(0.0804)	(0.0754)
comcur	–0.189*	–0.327***	0.137

	(0.105)	(0.115)	(0.102)
comleg	0.237***	0.331***	0.282***
	(0.0394)	(0.0411)	(0.0422)
dpc1	0.118**	0.0953*	0.487***
	(0.0852)	(0.0973)	(0.00955)
dpc2	0.102*	0.128	0.177***
	(0.106)	(0.115)	(0.0143)
dpc3	0.00964	0.0422	–0.113***
	(0.0414)	(0.0479)	(0.0199)
opc1	0.0200*	0.539***	0.0425
	(0.0947)	(0.0100)	(0.106)
opc2	–0.0300	0.170***	–0.00482
	(0.0912)	(0.0162)	(0.0985)
opc3	0.0248	–0.201***	0.0343
	(0.0456)	(0.0153)	(0.0492)
Constant	3.759	6.893	–13.49
	(16.79)	(14.85)	(10.69)
Time effects	yes	yes	yes
Destination effects	yes	yes	no
Origin effects	yes	no	yes
Observations	8,078	8,078	8,078
R-squared	0.850	0.792	0.816

Robust standard errors in parentheses

p<0.01***, ** p<0.05, * p<0.1

The results indicate that geographical distance between the origin and partner country has a negative impact on bilateral tourism flows. Thus, we control for time-invariant characteristics by adding origin-country and destination-country fixed effects. Adding fixed effects reduces the significance of institutional variables; this is not surprising as institutions, although not time-invariant, tend to change little from year to year. The coefficient on the first principal component of destination or origin institutional quality is significant and positive. In addition, in the second column after controlling the destination effects, we can see that the conflict culture is significant at the 1 percent level, which shows that if both source and host of countries have less religious tensions and less conflict, then the tourism inflows will be boosted between those countries. It can also be seen that when a source-country has a good level of institutional quality, there is greater opportunity for its population to engage in travel internationally.

Moreover, for the geographical variables, we see that contiguity (where the origin and destination have a common border) encourages tourism flows among countries; having the same language is also good for bilateral flows. We next take into account common legal origins. Geographic distance has often tended to deter tourism arrivals, especially where cheap travel is not widely available. It is a commonplace that trade partners having adjacent borders exchange much more trade with each other, and even exchange much more *than* trade with each other.

A similar situation often arises with tourism. Shared official language and colonial ties have almost the same impact on tourism. However, the more surprising result is the negative sign of common currency that is associated with a decrease in tourism arrivals in the model. In contrast to earlier findings (Santana-Gallego *et al.*, 2010), however, this result might be an outcome of the specification. For example, according to basic and extended gravity models *before* controlling the destination and origin, we obtained significant and positive results.

In Table 5.11 it can be seen that the results differ in line with which specification we applied. In addition, the same can be seen when we controlled for year and country fixed effects (see Appendix 8.1 at the end).

5.5.4 Estimation results of the gravity equation with country-pair effects

We next control for time and country-pair effects jointly. Taking the country-pair effects into consideration is important since some time-invariants such as distance, contiguity, *etcetera*, do not fully account for trust and social linkages (Papaioannou, 2009). We chose to run the overall index of ICRG variables, since we calculated the sum of the 12 indicators for origin and destination(PCO and PCD) as shown in Table 5.12.

We conclude that this index shows that the extent to which countries have sound political institutions, strong courts, and orderly succession of power really does serve to prompt higher levels of tourism arrivals. However, relating to the ICRG control variable, high values of its correlation coefficients with other variables mean that the ICRG risk-components have been an important determinant of macroeconomic variables. In addition, we notice that the ICRG index is more important for destination countries rather than originating countries, as shown in Table 5.10 below.

Table 5.8 Estimation results of the gravity equation with country-pair effects

VARIABLES	(1) logtourism	(2) logtourism	(3) logtourism
logdpop	1.169***	0.795***	1.161***
	(0.302)	(0.308)	(0.303)
logopop	0.399*	0.415**	0.414*
	(0.230)	(0.232)	(0.230)
logdgdpcapita	0.402***	0.339*	0.338**
	(0.132)	(0.139)	(0.137)
logogdpcapita	0.916***	0.905***	0.936***
	(0.118)	(0.121)	(0.119)
dpc1		0.151***	
		(0.0308)	
dpc2		0.0486*	
		(0.0278)	
dpc3		–0.0436***	
		(0.0124)	
opc1		0.00806	
		(0.0337)	
opc2		–0.0556	
		(0.0342)	
Opc3		–0.000469	
		(0.0145)	
PCD			0.617***
			(0.301)
PCO			–0.369
			(0.358)
Time effects	Yes	Yes	Yes
Country-pair effects	Yes	Yes	Yes

Constant	–32.06***	–24.89***	–33.60***
	(7.407)	(7.644)	(6.065)
Observations	8,078	8,078	8,078
R-squared	0.988	0.988	0.988

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Moreover, we notice that GDP per capita for origin and destination can be a factor that impairs the tourist flows between source and host-country. Regarding ICRG control variables, the results shown in Column 2 indicate that the first component to represent institutional quality is more important for destination-countries than for origin-countries. That means that the countries having high levels of law and order, less corruption, and with good investment profiles are much more likely to enjoy enhanced tourists flows rather than other countries having less encouraging indicators. Interestingly, those economic and demographical factors have significant impact on both origin- and destination-countries, whereas political-risk (ICRG) variables are more important for destination-countries rather than origin-countries.

For destination-countries, reforms solely aimed at improving tourism flows may not be very useful if the authorities and planners take no steps to address and resolve political-risk factors. The results displayed in Column 3 show that low levels of political risk tend to have a significant effect in increasing tourist inflows from origin to destination. The coefficient of overall political indicators for recipient countries shows a positive and significant effect influence at the 1 percent level. An increase of 5 percent in the overall constricted indicator causes an increase of 61.7 percent in the numbers of tourists travelling to a particular destination. The most surprising aspect of the overall political indicators for origin-countries is the presence of the negative sign and insignificant impact. The crucial need for a tourist destination to provide effective regulatory institutions is demonstrated. The results highlight the stark fact that the success of a tourism destination in attracting tourists will be in great part determined by the degree of its success in removing political risks and improving the quality of its governance, institutions and other relevant public bodies and services. We next ran the ICRG variables separately, with the results shown in Tables 5.13 and 5.14below.

Table 5.9 Augmented Gravity Model with ICRG variables

VARIABLES	(1) logtourism	(2) logtourism	(3) logtourism	(5) logtourism	(6) logtourism
logdist	–1.058***	–1.320***	–1.326***	–1.199***	–1.173***
	(0.0358)	(0.0305)	(0.0319)	(0.0332)	(0.0361)
logdpop	0.764***	0.764***	0.846***	0.856***	0.797***
	(0.0148)	(0.00984)	(0.0110)	(0.0121)	(0.0142)
logopop	0.529***	0.712***	0.729***	0.808***	0.608***
	(0.0151)	(0.0125)	(0.0123)	(0.0149)	(0.0153)
logdgdpcapita	–0.197***	–0.116***	–0.158***	–0.0685***	–0.185***
	(0.0172)	(0.0130)	(0.0128)	(0.0141)	(0.0165)
logogdpcapita	0.0577***	–0.0117	–0.0239**	0.0544***	0.0703***
	(0.0114)	(0.00920)	(0.00987)	(0.0106)	(0.0113)
comlang_off	0.939***	1.224***	0.651***	1.045***	1.021***
	(0.0750)	(0.0533)	(0.0597)	(0.0642)	(0.0731)
contig	1.305***	1.708***	1.955***	1.273***	1.211***
	(0.159)	(0.138)	(0.144)	(0.132)	(0.152)
comcol	–0.599***	–0.681***	–0.498***	–0.182**	–0.658***
	(0.0972)	(0.0823)	(0.0888)	(0.0841)	(0.0941)
comcur	3.254***	1.212***	0.689***	2.291***	2.825***
	(0.148)	(0.109)	(0.111)	(0.134)	(0.142)
comleg	–0.0968	0.272***	0.228***	0.115*	–0.103
	(0.0678)	(0.0487)	(0.0524)	(0.0588)	(0.0667)
DGS	0.0384**				
	(0.0189)				
OGS	0.127***				
	(0.0166)				
DSC		0.367***			
		(0.00844)			

OSC		0.525***			
		(0.00794)			
DIP			0.467***		
			(0.0108)		
OIP			0.506***		
			(0.0106)		
DIC				0.477***	
				(0.0174)	
OIC				0.645***	
				(0.0152)	
DEC					0.120***
					(0.0178)
OEC					0.294***
					(0.0227)
Constant	–2.043***	–10.14***	–14.65***	–20.49***	–8.714***
	(0.529)	(0.376)	(0.421)	(0.542)	(0.580)
Observations	8,078	8,078	8,078	8,078	8,078
R–squared	0.477	0.698	0.663	0.589	0.490

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 5.10 Extended Augmented Gravity Model with ICRG variables

VARIABLES	(1) logtourism	(2) logtourism	(3) logtourism	(4) logtourism	(5) logtourism	(6) logtourism	(7) logtourism
logdist	–1.343***	–1.383***	–1.180***	–1.155***	–1.096***	–1.097***	–1.365***
	(0.0319)	(0.0311)	(0.0337)	(0.0335)	(0.0353)	(0.0317)	(0.0302)
logdpop	0.760***	0.914***	0.826***	0.755***	0.786***	0.706***	0.768***
	(0.0105)	(0.0115)	(0.0132)	(0.0116)	(0.0134)	(0.0118)	(0.00950)
logopop	0.702***	0.733***	0.686***	0.672***	0.620***	0.606***	0.669***
	(0.0131)	(0.0131)	(0.0149)	(0.0142)	(0.0149)	(0.0140)	(0.0125)
logdgdpcapita	–0.144***	0.0326***	–0.117***	–0.122***	–0.174***	0.0208	–0.216***
	(0.0143)	(0.0126)	(0.0184)	(0.0149)	(0.0171)	(0.0141)	(0.0139)
logogdpcapita	–0.0169	0.0376***	0.101***	0.0213**	0.0552***	0.0561***	–0.0366***
	(0.0103)	(0.00991)	(0.0109)	(0.0106)	(0.0111)	(0.0102)	(0.00925)
contig	1.483***	1.120***	0.923***	1.675***	1.318***	1.555***	1.771***
	(0.151)	(0.119)	(0.149)	(0.158)	(0.149)	(0.147)	(0.145)
comlang_off	0.544***	0.774***	0.795***	0.876***	0.926***	0.469***	0.478***
	(0.0627)	(0.0570)	(0.0696)	(0.0661)	(0.0706)	(0.0664)	(0.0570)
comcol	–0.185**	–0.266***	0.0642	–0.545***	–0.362***	–0.215**	–0.511***
	(0.0916)	(0.0801)	(0.0962)	(0.0897)	(0.0932)	(0.0981)	(0.0880)
comleg	0.245***	0.181***	–0.00276	0.219***	–0.0453	0.257***	0.231***
	(0.0563)	(0.0527)	(0.0665)	(0.0597)	(0.0670)	(0.0565)	(0.0518)
comcur	1.003***	1.148***	3.022***	1.716***	2.849***	1.712***	1.146***

	(0.132)	(0.116)	(0.141)	(0.123)	(0.143)	(0.141)	(0.0997)
DCC	0.650***						
	(0.0187)						
OC	0.955***						
	(0.0160)						
DMP		0.589***					
		(0.0156)					
OMP		0.724***					
		(0.0136)					

Table 5.14 Extended Augmented Gravity Model with ICRG variables—continued

VARIABLES	(1) logtourism	(2) logtourism	(3) logtourism	(4) logtourism	(5) logtourism	(6) logtourism	(7) logtourism
DRP			0.159***				
			(0.0199)				
ORP			0.622***				
			(0.0209)				
DLO				0.399***			
				(0.0189)			
OLO				0.843***			
				(0.0181)			
DET					0.313***		
					(0.0220)		
OET					0.384***		
					(0.0215)		
DDA						0.757***	
						(0.0195)	
ODA						0.553***	
						(0.0140)	
DBQ							0.719***
							(0.0205)
OBQ							1.285***
							(0.0168)

Constant	–7.937***	–14.06***	–10.76***	–10.00***	–7.654***	–11.62***	–6.870***
	(0.389)	(0.420)	(0.553)	(0.436)	(0.526)	(0.405)	(0.358)
Observations	8,078	8,078	8,078	8,078	8,078	8,078	8,078
R-squared	0.642	0.655	0.527	0.599	0.501	0.621	0.696

The implications of the results shown in Table 5.10 were clear. Success in self-marketing will go hand-in-hand with success in self-improvement, which in turn will be a powerful determinant of the success of its tourist trade. Thus, it is expected that countries enjoying good institutional quality (including the rule of law and the control of corruption) will see a corresponding increase in beneficial tourist flows. These findings were corroborated when the ICRG variables were run separately to see how each affects tourism flows, with the results shown in Tables 5.13 and 5.14 above. It is apparent from these tables that the role of institutions/political-risk factors in attracting cross-border tourists is considerable. Moreover, institutional quality in both origin-countries and destination-countries has a positive effect on tourism flows and the size of the effect is, in most cases, of similar magnitude, too. We can see that all the ICRG variables have significant positive effects for both of origins and destinations countries.

5.5.5 Results from the Hausman-Taylor Model

We used the Hausman-Taylor model with alternative endogeneity assumptions (see the preceding discussions) and these were applied to evaluate the effect of time-invariant variables on tourism and to check their comparability with some of the findings of the previous literature on the determinants of tourism. Table 5.15 below shows the results obtained by estimating the Hausman-Taylor model with the following specifications. The *GDP* per capita was treated as endogenous in all four specifications. In the first regression, we used the *three* principal components for origin and destination. Then we ran the regression using each component individually for robustness checks. We see that the first principal component (institutional quality) for destinations is significant at the 1 percent level, which means that countries with higher institutional quality attract more tourists. Conflict in origin-countries (second principal component) in specification #1 showed a positive effect which is significant at the 5 percent level. This might be explained by the tendency for greater numbers of tourists to originate from countries that enjoy low levels of tension in religion and conflict. The conflict culture marker for destination is positive but not significant, perhaps owing to the main variation in the first principal component. Sharing a common border, common language and common currency tend to help to increase tourism inflows. In three specifications, tourism increases when any two countries have the same colonial background.

Table 5.11 Hausman-Taylor model with analysis of three principal components

VARIABLES	(1) logtourism	(2) logtourism	(3) logtourism	(4) logtourism
logdpop	1.216***	1.231***	1.242***	1.243***
	(0.0622)	(0.0627)	(0.0623)	(0.0630)
logopop	1.056***	1.076***	1.066***	1.085***
	(0.0695)	(0.0700)	(0.0699)	(0.0704)
logdgdpcapita	0.327***	0.336***	0.410***	0.418***
	(0.0763)	(0.0758)	(0.0724)	(0.0734)
logogdpcapita	1.096***	1.148***	1.048***	1.083***
	(0.0915)	(0.0891)	(0.0880)	(0.0887)
dpc1	0.116***	0.0898***		
	(0.0310)	(0.0264)		
dpc2	0.0160		0.00311*	
	(0.0296)		(0.0278)	
dpc3	–0.0177			0.00458
	(0.0133)			(0.0112)
opc1	–0.0357	–0.0497*		
	(0.0301)	(0.0256)		
opc2	0.0633**		0.0712***	
	(0.0288)		(0.0270)	
opc3	–0.00711			0.00569
	(0.0141)			(0.0126)
logdist	0.129	0.134	0.220	0.193
	(0.209)	(0.212)	(0.209)	(0.210)
comcol	0.776**	0.878**	0.909**	0.968***
	(0.357)	(0.364)	(0.362)	(0.365)
comcur	5.513***	5.605***	5.844***	5.800***
	(0.692)	(0.704)	(0.688)	(0.694)
contig	3.437***	3.410***	3.577***	3.534***
	(0.582)	(0.597)	(0.591)	(0.597)
comleg	0.102	0.0988	–0.0181	0.00422
	(0.225)	(0.231)	(0.227)	(0.230)

comlang_off	1.008***	1.031***	1.141***	1.148***
	(0.258)	(0.265)	(0.261)	(0.263)
Constant	–46.92***	–48.19***	–48.65***	–49.22***
	(3.198)	(3.168)	(3.136)	(3.180)
Observations	8,078	8,078	8,078	8,078
Number of paired	1,973	1,973	1,973	1,973
Sargen test	0.19	0.13	0.09	0.08

Robust standard errors in parentheses*** p<0.01, ** p<0.05, * p<0.1

For our main interest, it is to be noted that the presence of institutional quality shows positive and significant effects that are greater for host-countries than they are for origin-countries. On the other hand, economic factors (income) figure as an important determinant in origin-countries more than for destination-countries. It can be seen from Table 5.15 above that the coefficient of GDP per capita for origin-countries (at 1.096) is considerably higher than that (0.327) for GDP per capita of destination-countries. This would be expected, as individuals tend to travel more frequently as they become more affluent. Moreover, a shared language will increase tourism inflows between two countries. It is reasonable to expect a common language to have a positive impact on trade in services (perhaps even more so than for trade in goods). Communication is greatly facilitated by a common language (Walsh, 2006). In addition, common colonial background, common currency, and common border likewise promote higher levels of tourism. Clearly, sharing a common border or having common history should make the flow of information easier; the common border dummy is positive and significant in the regression and these results agree with the findings of other studies (e.g. Fidrmuc and Karaja, 2013). Most studies tend to investigate the determinants of tourism with respect to economic factors. While few researchers have focused solely on political and institutional reforms, we find that institutional quality is important, together with culture and conflict in determining tourism flows. Distance has no significant influence on tourism flows using the HTM. As for contiguity, this may indicate that physical distances have little or no relevance for the movement of tourists.

The Hausman-Taylor model was checked to see whether the instruments were valid or not. The first two specifications, according to the Sargan (1958) test, are valid but the last two are valid at just the 5 percent level. This result might arise owing to the main variation of loading in the first principal component.

5.5.6 Results of count Model (Poisson Model)

Certain writers, including Santos Silva and Tenreyro (2006), have suggested performing an estimation of the model in levels rather than in logs by applying the Poisson Estimator with clustered standard errors, as the interpretation of coefficients as elasticities in log-linearized OLS can be highly biased in the presence of heteroskedasticity. Accordingly, we applied the Poisson Pseudo-Maximum Likelihood estimator to correct for the presence of heteroskedasticity, and to investigate the relationships between the three principal components, indices of ICRG and tourism, as well as common language and colonial ties. To test the hypothesis, we implemented heteroskedasticity-robust standard errors that allow for clustering within country-pairs; this addresses issues of over-dispersion associated with Poisson distributions as well as that of serial correlation. Table 5.16 below shows that the PPML estimation results are similar to the pooled OLS results. GDP per person and population size continue to have significant positive impacts on tourism flows although the coefficients in each case become smaller. Similarly, higher results from the principal component analysis indicate that greater numbers of tourists are willing to travel abroad.

Language and contiguity are important for tourism in the PPML estimation in all five regressions. In addition, the results show that better institutional quality and the lack of conflict both produce more significance in terms of tourism flows, whilst GDP per capita is a better determinant for origin rather than for destination. Moreover, when the source- and recipient-countries share the same currency, this often leads to the generation of greater tourism inflows; this result is in line with Santana *et al*. (2010).

Table 5.12 Results of count model (Poisson model)

VARIABLES	(1) Tourism flows	(2) Tourism flows	(3) Tourism flows	(4) Tourism flows	(5) Tourism flows
logdist	–1.122***	–0.855***	–0.810***	–1.123***	–1.124***
	(0.117)	(0.102)	(0.108)	(0.120)	(0.116)
logdpop	0.730***	0.618***	0.611***	0.715***	0.716***
	(0.0338)	(0.0324)	(0.0329)	(0.0296)	(0.0326)
logopop	0.574***	0.605***	0.584***	0.662***	0.551***
	(0.0265)	(0.0397)	(0.0387)	(0.0318)	(0.0297)
logdgdpcapita	–0.0396	0.00163	–0.118***	0.120***	–0.0256
	(0.0244)	(0.0475)	(0.0293)	(0.0381)	(0.0258)
logogdpcapita	0.0445***	0.0247	0.0174	0.0663***	0.0525***
	(0.0150)	(0.0201)	(0.0202)	(0.0155)	(0.0156)
contig	1.113***	1.388***	1.480***	1.027***	1.081***
	(0.304)	(0.257)	(0.284)	(0.299)	(0.289)
comlang_off	0.491***	–0.413**	–0.381**	0.379***	0.442***
	(0.0936)	(0.168)	(0.165)	(0.106)	(0.114)
comcol	–0.0488	1.237***	1.016***	0.415***	0.297
	(0.155)	(0.208)	(0.185)	(0.158)	(0.193)
comleg	–0.0352	0.0931	0.148	–0.180	–0.103
	(0.134)	(0.131)	(0.130)	(0.148)	(0.142)
comcur	1.398***	0.469**	0.253	1.410***	1.396***
	(0.142)	(0.206)	(0.200)	(0.145)	(0.162)
dpc1		0.228***	0.291***		
		(0.0349)	(0.0293)		
dpc2		0.240***		0.418***	
		(0.0613)		(0.0530)	
dpc3		–0.0385			–0.0261
		(0.0807)			(0.0734)
opc1		0.391***	0.426***		

		(0.0346)	(0.0331)		
opc2		0.113***		0.340***	
		(0.0378)		(0.0347)	
opc3		–0.0409			–0.242***
		(0.0534)			(0.0521)
Constant	–18.88***	–20.46***	–19.08***	–21.99***	–18.52***
	(1.364)	(1.405)	(1.242)	(1.505)	(1.346)
Observations	8,078	8,078	8,078	8,078	8,078
R-squared	0.465	0.552	0.527	0.514	0.450

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

In general, we can conclude that GDP per capita for origin, population size, common language and common currency are important factors in increasing tourism flows according to the Poisson Model. The overall response to the importance of ICRG variables in the determining of arrivals inflows is that the first dimension of ICRG (institutional quality) was very positive and encourages people to choose to travel to the destination, while for the results from the OLS the PPML estimations indicate that the ICRG variables are the main determinants of tourism flows.

These findings lead to the conclusion that corruption not only affects growth and investment, as confirmed by many authors, but that it also has a detrimental effect on the tourism sector. Since tourism contributes a great proportion of the GDP in developing nations in particular, a policy implication is that reducing public-sector corruption will increase an economy's wealth in more ways than one: by increasing growth, investment and GDP—as shown by Mauro (1995) and others—and by increasing income-streams from tourism.

5.6 Conclusion

This study examined the impacts of twelve major ICRG variables on tourism flows using gravity models estimated with standard OLS, the Hausman-Taylor model and the PPML technique. To investigate the relationship between the ICRG variables and tourism, we incorporated three principal components in the analysis, *i.e.* institutional quality, conflict culture and government effectiveness, in addition to some basic and extended gravity variables such as GDP per capita, population, common language, *etcetera*. We applied the traditional estimation technique based on log-linearization of the model, as well as the Hausman-Taylor estimator and the Poisson Pseudo-Maximum Likelihood estimation technique in order to compare the results of these three approaches.

The estimated coefficients in the OLS model differed from our expectations. For instance, the OLS and other traditional models in this study have yielded results indicating that the effect of the partner-country's GDP for source and destination is not a crucial determinant for tourism flows when we control for destination and origin effects. This result is contrary to our expectations, since the previous studies have suggested that GDP is an important determinant for tourism flows between two countries. However, the basic gravity estimation methods have predicted a significant positive impact for GDP *per capita.* In addition, the presence of a common language is found to be one of the most important determinants of tourism between two countries. The results are also consistent with earlier research, which showed that distance does not well explain flows in *service-trade*.

Regarding the Hausman-Taylor estimator, we find that institutional quality is important, together with culture and conflict, in determining tourism flows. Distance has no significant influence on tourism flows according to the HTM. As for contiguity, this may indicate that physical distances have little or no relevance for the movement of tourists. The Poisson Pseudo-Maximum Likelihood estimator is the only estimation method that has been performing correctly to the specifications and has provided good estimation results according to the Gravity Model theory.

Moreover, in order to answer the central question regarding how institutional quality affects tourism flows, we added the three principal components as explained in Section 5.3. We can report that institutional quality in both origin-countries and destination-countries encourages greater tourist flows. For the second component, absence of conflict and tensions have a positive and significant sign, which means that low levels of risk of conflict do attract tourists to visit such destinations, or at least do not deter them from doing so. The last component gives an indication that higher levels of government stability encourage tourist inflows even when there is lower democratic accountability. Therefore, political-risk levels (especially the first component) play an effective role and boost cross-border tourism.

In summary, the results of this study suggest that lower levels of political risk contribute to an increase in tourism flows. Common language, common currency and political risk (particularly institutional quality) are highly important determinants in promoting tourism. Since tourism contributes a great proportion to national GDP especially in developing countries, a policy implication is that reducing the political risk and increasing the institutional quality will lead to an increase in an economy's wealth in different ways. As previously stated, one example of institutional quality enhancement is the reduction of corruption; if this is successful it will lead to an increase in growth, investment, and GDP, and by increasing revenue from tourism (Mauro 1995). It would be most useful for future research to focus on analysing the longer time spans, in conjunction with additional data on tourism becoming available. The combination of the two features might well help address the issues encountered when attempting to estimate dynamic/system GMM models; at the commencement of this work, the dataset available covered only the period 2005–2009. Future research could also expand the analysis by splitting the samples according to ICRG—those relevant for tourism to advanced economies, and those relevant for tourism to developing countries—which could not be incorporated into the present study owing to data limitations especially for destination countries.

6 Concluding Remarks

This thesis contributes to the literature on the concepts of tourism, the relationship between tourism specialization and economic growth, as well as the exploration and identification of the determinants influencing tourist flows. The stimulus for conducting research in this area arose from the fact that there is little or no convergence within the earlier and recent literature with respect to the studies, investigations and findings either regarding the effect of tourism on economic growth or about the main determinants of tourism.

Smith (2001) remarked on how individuals in the 1980s were wondering whether tourism could be seen as a blessing or as a curse, and she observed how such questions are now academic, given that tourism is the world's largest industry, and given its global role in generating jobs and in providing customers to support those jobs. While these questions are easily caught up in the wider debate surrounding the effects of globalization, the more important issue now in a scientific academic approach should be how to examine the role that tourism plays in the economy, and how to identify the benefits and disadvantages (in financial and non-financial terms) that proceed from tourism in any particular locality. Some studies support the argument that tourism can make a positive impact on economic growth (e.g. Khan et al., 1990; Copeland, 1991; Balaguer and Cantavella-Jordá, 2002; Lim and Cooper, 2009). However, others have indicated that the hypothesis that tourism leads to economic development is to be rejected (e.g. Oh, 2005; Sequeira and Campos, 2005).

Therefore, in the second essay we discussed the most important factors that influence travel and tourism; amongst others these factors include diseases, natural disasters, pollution, climate and weather, and advances in technology. After that, we discussed the benefits and costs of tourism, presenting what previous studies have had to say about this issue. In the third essay, we performed an analysis to examine the relationship between tourism and economic growth; it covered 131 countries over the period 1995 to 2007, including 32 countries highly dependent on tourism during that period. Moreover, we divided countries into two groups according to their international receipts as share of exports—tourism-exporting countries, which have international tourist receipts in excess of a 14 percent threshold against exports, and non-tourism-exporting countries which have receipts against exports below this threshold. The analysis made use of an interaction term, which represents trade as a share of GDP multiplied by a tourism specialization index. The general conclusion based on the empirical investigations carried out in this thesis is that the fixed-effects models suggest that tourism specialization has no significant effect on economic growth.

Similar results were obtained that indicate that tourism does not play a role in fostering economic growth when we split the sample into underdeveloped and developed countries. After factoring in the mutual interaction, we discovered that Dutch Disease might appear in the broad sample if there is a dependence on tourism essentially as a main factor of economic growth in a particular country. In addition, we found that tourism affects trade positively, causing Dutch Disease through a dependence on tourism, but only in tourism-exporting countries. The main policy recommendation for countries that rely heavily on exporting tourism is that they should pay greater attention to diversifying their economies into manufacturing, and to investing in the infrastructure system quite apart from those facilities related to tourism and tourist commodities. During this study it has been found that tourism might indeed become a curse rather than a blessing for countries that export tourism. Therefore, study of the tourism industry faces challenges and opportunities, and further research should play its part in examining more deeply the dynamics of this industry. Whilst the magnitude of tourism increases for the economies of countries throughout the world, so the need for further research increases to understand the channels through which tourism exerts its effects on economic growth, and on environmental and social conditions.

The main contributions and conclusions of the final two essays of this thesis can be summarized as follows. Firstly, Chapter 4 contributes to the literature on determinants of tourism considering the impact of institutional quality and infrastructure on tourism flows in the context of a whole sample of 131 countries during the period between 1995 and 2007. In addition, we split the sample according to IMF classification (developed and developing countries) and according to population size (small and large countries). In doing so, the investigation in this chapter showed that there is a positive and highly significant relationship between governance, internet availability and tourism flows. However, the question is obviously more complex. We also note that the governance variables used vary little from one year to another owing to the short duration of the series (8 years), which in turn is related to the current lack of long-series data on governance. In addition, the positive relationships between the information technology variable and tourism flows in our estimated model appear to corroborate the idea that the increasing levels of technology in the tourism industry have generated beneficial effects for the industry, other things being equal (e.g. absence of conflict). Also, promoting the technology industry enhances the tourism industry. For the conflict factor, it is clear from the results that it is bad news for a country. For developed and developing countries, the findings support the view that institutional quality seems to be more relevant for international tourists, whilst issues surrounding the communications infrastructure (measured by internet availability and usage) give rise to important considerations for the levels of tourist arrivals in both samples.

Our analysis suggests that policy-makers in tourist destinations are rightly concerned about safety and stability. From an economic policy perspective, it is useful to further develop the infrastructure, communications system, and the quality of institutions with a view to fostering the growth of tourism flows, given that the impact of infrastructure and governance indicators on the latter is positive and significant. This suggests that the nexus linking tourism flows, internet usage and institutional quality may be a fundamentally key determinant in the whole sample embracing developed/developing and large/small countries. Hence, in future research it would be well to conduct in-depth investigations into the impact of communications (internet availability/usage) and governance indicators upon tourist flows in different samples across the various regions. This would help to ascertain the extent to which the results of this chapter can be generalized to other natural-resource-dependent countries. We hope make-determined efforts to deal with these questions in the future.

Secondly, Chapter 5 examines the tourism relationship by providing a comparison of country-risk ratings (ICRG) and how they affect tourism flows. The main contribution of this chapter rests in using a variety of gravity-equation approaches to the relationship between ICRG data and tourism. When principal components analysis (PCA) was applied to the 12 political-risk variables from the ICRG, the PCA identified three components, which together explain more than 72 percent of total variance. Our research generated findings from the panel-data sets for 134 originating countries and 31 destination countries (selected depending on data availability) by running estimates of the gravity equation using three approaches—the traditional, the Hausman-Taylor and the Poisson estimation techniques.

The findings of this chapter confirm that there are significant relationships between the various factors, whichever estimation technique is used. The findings also confirm that the impacts are significant and direct. In summary, the results of this study suggest that lower levels of political risk contribute to an increase in tourism flows. Furthermore and in particular, common language and political-risk (particularly institutional quality) act as the most highly important determinants in promoting tourism. Moreover, the three models confirm that institutional quality in both origin-countries and destination-countries encourages greater tourist flows. For the second component, absence of conflict and tensions have a positive and significant sign, which indicates that low levels of risk of conflict do attract tourists to visit such destinations, or at least do not deter tourists from visiting them. The last component gives an indication that higher levels of government stability encourage tourist inflows even when there is lower democratic accountability. Therefore, political-risk levels (especially the first component) play an efficient role and boost cross-border tourism. Regarding the main variable of gravity (population) in our estimation, the three models confirmed that population has no appreciable effect on tourism flows between host and home countries, but GDP per capita variables are positively significant.

Since tourism contributes a great proportion of the GDP of many nations—developing countries in particular—one policy implication is that reducing the political risk and increasing the institutional quality of tourist destinations will increase the wealth of an economy in different ways. For example, the enhancement of institutional quality, especially through a reduction in local corruption and nonuser-friendly practices, will increase growth, investment and GDP (as shown by Mauro, 1995, 2004) by increasing the revenue derived from tourism, both directly and indirectly (through increases in tax revenues and in other ways).

Future research could focus on analysing the longer time spans, in line with additional data on tourism becoming available. This would be of particular help in address the issues encountered when attempting to estimate dynamic/system GMM models; at the commencement of this work, the dataset available covered only the period 2005–2009. Future research could also expand the analysis in splitting the samples according to ICRG into two groups—{relevant for tourism within advanced economies} and {relevant for tourism within developing countries}—which have not been incorporated in the current study owing to data limitations especially for destination countries.

Although the author believes that this thesis covers quite a lot of background, nevertheless it also has several limitations. One of the main limitations of this research is the data on tourism arrivals. In fact, in order to obtain a complete picture of the extent of tourism data for any country, several factors must be taken into account. These factors should reflect as fully as possible the particular local conditions of the tourism sector, not simply the generic ones apparently common to all destinations from a superficial inspection. For example, the analysis was hindered by limitations in obtaining data that reflect all aspects of the degree of penetration by tourism into the national and local economies in the samples of countries used in the analysis. In addition, the data that UNTWO provide require considerable work and effort to adapt and organize into a dataset that can be used for any particular analytical model. Therefore, it was necessary for the analysis conducted in this thesis to narrow the selection of the tourism-arrival indicators to the most widely-used measures that have been considered in the previous literature based on data availability. It is hoped, however, in spite of these limitations, that the essays in this thesis will make a fairly significant contribution to the literature on tourism studies.

7 Appendix A

7.1 *Hausman Test*

	fixed	random	Difference.	S.E.
dgdp	8.035526	7.041849	.9936779	.0925537
logPOP	0.961852	0.653729	.3081228	.1948208
logTrade	0.604268	0.657879	–.0536112	.0213743
logppp	0.599053	0.643769	–.0447167	.0111787
loghealth	0.004701	0.025037	–.020336	.0198164
lognetsize	0.074362	0.08183	–.0074672	.0044818
pca	0.157203	0.205254	–.0480507	.0128287
conflict	–0.102120	–0.10535	.0032307	.0044926

chi2(8) = (b-B)'[(V_b-V_B)^(-1)](b-B) = 28.14 Prob>chi2 = 0.0004

7.2 *Hausman Test with toap*

	fixed	random	Difference.	S.E.
logPOP	–0.0381486	–0.3462713	0.308123	0.1948208
logTrade	0.6042673	0.6578785	–0.05361	0.0213743
logppp	0.5990525	0.6437692	–0.04472	0.0111787
loghealth	0.0047014	0.0250373	–0.02034	0.0198164
lognetsize	0.0743623	0.0818295	–0.00747	0.0044818
pca	0.1572033	0.205254	–0.04805	0.0128287
conflict	–0.1021225	–0.1053532	0.003231	0.0044926

chi2(8) = (b-B)'[(V_b-V_B)^(-1)](b-B) = 28.14 Prob>chi2 = 0.0004

7.3 *Hausman Test in developed countries*

	fixed	random	Difference.	S.E.
dgdp	6.270304	10.96637	–4.696071	.
logPOP	–0.88882	0.7340281	–1.622847	0.350102
logTrade	0.838009	0.7346406	0.1033688	0.017901
logppp	0.54505	0.484699	0.060351	.
loghealth	–0.09084	–0.141155	0.0503178	0.027164
lognetsize	0.08506	0.0568542	0.0282057	0.00451

pca	0.145009	0.1686633	0.0236542	0.013203
conflict	–0.05861	–0.121639	0.0630278	.

chi2(8) = (b-B)'[(V_b-V_B)^(-1)](b-B) = 31.84 Prob>chi2 = 0.0001

7.4 *Hausman Test in developed countries*

	fixed	random	Difference.	S.E.
dgdp	7.51979	6.415809	1.103981	.
logPOP	1.1923	0.6398926	0.5524071	0.230129
logTrade	0.579118	0.6754121	–	0.022559
logppp	0.63164	0.6812586	–	0.005982
loghealth	0.063521	0.0507297	0.0127909	0.020496
lognetsize	0.070579	0.0850127	–	0.005323
pca	0.156811	0.2161995	–	0.011458
conflict	–0.09451	–0.097857	0.0033441	.

chi2(8) = (b-B)'[(V_b-V_B)^(-1)](b-B)= 54.45 Prob>chi2 = 0.0000

7.5 *Hausman Test for large population-size countries*

	fixed	random	Difference.	S.E.
dgdp	11.35628	10.58598	0.7703047	.
logPOP	2.316391	0.8133799	1.503011	0.286399
logTrade	0.547027	0.6702962	–	.
logppp	0.445947	0.5616915	–	.
loghealth	0.115791	0.2624211	–	0.005889
lognetsize	0.020743	0.0539659	–	0.005926
pca	0.089032	0.1488039	–	0.013395
conflict	–0.11192	–0.101853	–	.

chi2(8) = (b-B)'[(V_b-V_B)^(-1)](b-B) = 49.61 Prob>chi2 = 0.0000

7.6 *Hausman Test for small population-size countries*

	fixed	random	Difference.	S.E.
dgdp	2.91815	2.66922	0.248938	0.690288
logPOP	0.21131	0.588837	–	0.249956
logTrade	0.62050	0.594541	0.025966	0.043838
logppp	0.67531	0.658624	0.016695	0.023623
loghealth	–	–	0.005100	0.039544
lognetsize	0.12978	0.120552	0.009227	0.006391

pca	0.17638	0.222250	–	0.02178
conflict	–	–	0.027739	0.041929

chi2(8) = (b-B)'[(V_b-V_B)^(-1)](b-B) = 7.05   Prob>chi2 = 0.5314

8 Appendix B

8.1 *Contiguity controlled for year and country fixed effects*

VARIABLES	(1) logtourism	(2) logtourism	(3) logtourism
logdpop	1.169***	0.795***	1.104***
	(0.302)	(0.308)	(0.305)
logopop	0.399*	0.415*	0.412*
	(0.230)	(0.232)	(0.230)
logdgdpcapita	0.402***	0.339**	0.305**
	(0.132)	(0.139)	(0.135)
logogdpcapita	0.916***	0.905***	0.932***
	(0.118)	(0.121)	(0.119)
comcur	-0.826	-3.089	-1.593
	(1.874)	(1.932)	(1.925)
dpc1		0.151***	
		(0.0308)	
dpc2		-0.0486*	
		(0.0278)	
dpc3		-0.0436***	
		(0.0124)	
opc1		0.00806	
		(0.0337)	
opc2		-0.0556	
		(0.0342)	
opc3		-0.000469 (0.0145)	
pco			-0.0250
			(0.0285)

pcd			0.0796***
			(0.0247)
Constant	-32.06***	-24.89***	-30.16***
	(7.407)	(7.644)	(7.581)
Year fixed effects	Yes	Yes	Yes
Country pair effects	Yes	Yes	Yes
Observations	8,078	8,078	8,078
R-squared	0.988	0.988	0.988

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

9 Appendix c

9.1 Descriptive statistics for first chapter within more details.

Variable		Mean	Std. Dev.	Min	Max	Observations
gce	overall	15.68838	5.778924	3.36423	39.1937	N = 1695
	between		5.446456	4.877276	28.99367	n = 133
	within		2.010961	6.431003	27.17821	T-bar = 12.7444
i	overall	21.78991	6.848701	3.48003	64.1418	N = 1670
	between		5.679105	8.269874	45.55693	n = 133
	within		3.962142	0.999731	45.41389	T = 12.5564
pop	overall	1.336841	1.219802	-3.93064	10.0428	N = 1724
	between		1.104265	-1.33331	4.103721	n = 133
	within		0.529338	-4.68191	7.27592	T-bar = 12.9624
trade	overall	86.16207	49.27787	14.7725	456.646	N = 1680
	between		51.55889	21.93957	412.4021	n = 133
	within		11.925	22.00484	178.6359	T-bar = 12.6316
ttradep	overall	6.388372	12.36387	0.004462	116.4984	N = 1638
	between		12.65276	0.038268	103.6793	n = 133
	within		2.841736	-12.9131	60.5484	T-bar = 12.3158
school	overall	74.75916	31.5836	5.17789	161.662	N = 1191
	between		31.7321	5.73342	152.4844	n = 132
	within		6.226507	48.94466	106.739	T-bar = 9.02273
growth	overall	2.900116	4.036521	-29.6301	33.0305	N = 1592
	between		2.202261	-2.54978	12.57449	n = 133
	within		3.386093	-24.1802	23.35613	T = 11.9699

le	overall	67.65472	9.988338	31.2392	85.1634	N = 1701
	between		9.835651	39.19711	81.21799	n = 133
	within		1.649838	51.41642	78.82512	T-bar = 12.7895

9.2 Descriptive statistics for second chapter in more details

Variable		Mean	Std. Dev.	Min	Max	Observations
countr~e	overall	98.74194	58.16915	1	197	N = 1767
	between		58.39268	1	197	n=133
	within		0	98.74194	98.74194	T-bar = 12.9926
GDPPER	overall	8042.055	11187.79	108.9024	67138.52	N = 1760
	between		11189.57	112.9858	56073.74	n=133
	within		1382.881	-3271.82	19106.83	T-bar = 12.9412
TOA	overall	5004512	1.04E+07	11000	8.09E+07	N = 1680
	between		1.01E+07	67333.33	7.27E+07	n=133
	within		1816440	-9273873	2.54E+07	T-bar = 12.3529
netpop	overall	13.99372	20.16298	0	88.90034	N = 1699
	between		14.9551	0.101163	56.63166	n=133
	within		13.52761	-34.5956	64.4611	T-bar = 12.4926
POP	overall	4.25E+07	1.45E+08	61700	1.32E+09	N = 1767
	between		1.45E+08	62648.6	1.27E+09	n=133
	within		6874659	-6.35E+07	1.46E+08	T-bar = 12.9926
ppp	overall	0.574099	0.278601	0.140434	1.860173	N = 1728
	between		0.263239	0.277358	1.322858	n=133
	within		0.091801	0.245572	1.123063	T-bar = 12.8955
TELPOP	overall	22.65227	20.31546	0.076353	90.36677	N = 1747
	between		20.05261	0.215061	85.83148	n=133
	within		3.150024	6.159036	37.2302	T-bar = 12.8456
Trade	overall	87.27659	51.59567	14.77247	438.9016	N = 1733
	between		49.75758	22.36189	372.9004	n=133
	within		12.82125	19.81148	179.7239	T-bar = 12.7426
conflict	overall	0.160159	0.443702	0	2	N = 1767
	between		0.389997	0	1.846154	n=133
	within		0.213859	-1.53215	2.006312	T-bar = 12.9926

ps	overall	-0.01963	0.944577	-3.05644	1.57687	N = 1196	
	between		0.905607	-2.41734	1.422584	n=133	
	within		0.269317	-1.11669	1.267123	T-bar = 8.92537	
voice	overall	0.110689	0.92784	-1.95119	1.82669	N = 1192	
	between		0.911113	-1.72669	1.602511	n=133	
	within		0.170564	-0.94727	0.763866	T-bar = 8.89552	
reg	overall	0.16488	0.916643	-2.52663	2.02558	N = 1186	
	between		0.88953	-1.85087	1.836446	n=133	
	within		0.22565	-0.98218	1.532048	T-bar = 8.85075	
low	overall	0.078455	0.968781	-2.31285	1.96404	N = 1191	
	between		0.947071	-1.94313	1.886921	n=133	
	within		0.199982	-1.29753	1.457386	T-bar = 8.88806	
coc	overall	0.139367	1.020891	-2.48921	2.46656	N = 1171	
	between		0.989716	-1.65981	2.335351	n=133	
	within		0.227465	-1.38999	1.306384	T-bar = 8.73881	
eog	overall	0.140364	0.972304	-2.39408	2.23691	N = 1179	
	between		0.951077	-1.67847	2.085287	n=133	
	within		0.196675	-0.97442	0.953262	T-bar = 8.79851	
pca	overall	0.266477	2.170471	-4.56873	4.622228	N = 1157	
	between		2.127116	-3.69779	4.462629	n=133	
	within		0.33157	-1.09406	2.087353	T-bar = 8.63433	
LF	overall	69.31159	9.239378	41.92988	82.50707	N = 1737	
	between		9.119442	43.22899	81.21799	n=133	
	within		1.409327	63.65468	77.9887	T-bar = 12.7721	
dgdp	overall	0.004061	0.005849	-0.03013	0.104125	N = 1624	
	between		0.003329	-0.00557	0.018218	n=133	
	within		0.004813	-0.0265	0.089968	T-bar = 11.9412	

9.3 Descriptive statistics for third chapter with in more details

Variable		Mean	Std. Dev.	Min	Max	Observations
tourism	overall	164054.7	1115032	1	2.00E+07	N = 8208
	between		1041357	1	1.96E+07	n = 1993
	within		81949.11	-2235945	2504055	T-bar = 4.11841
dgdpca~a	overall	262396.1	1139750	275.453	9200000	N = 9907
	between		1134526	294.1074	8500000	n = 1993
	within		69909.37	-437604	962396.1	T-bar = 4.9709
odgdpc~a	overall	657850.4	2356413	275.453	2.40E+07	N = 9858
	between		2348667	294.1074	2.16E+07	n = 1974
	within		179166.5	-1942150	3057850	T-bar = 4.99392
opop	overall	6.26E+07	1.88E+08	296734	1.30E+09	N = 9965
	between		1.88E+08	309599	1.30E+09	n = 1993
	within		5321644	2601266	1.03E+08	T = 5
dpop	overall	4.78E+07	8.03E+07	329088	3.10E+08	N = 9965
	between		8.03E+07	341918.2	3.02E+08	n = 1993
	within		1521579	3.78E+07	5.78E+07	T = 5

10 Appendix d

10.1 Some statistics of variables by Country code.

ountrycode	stats	GCE	I	POP	trade	gdpcon~t	TRP	secsch~l
1	mean	9.88599	22.7786	-0.09817	59.6566	1264.99	7.78296	72.7962
	sd	1.26262	3.98167	0.536994	11.9657	270.434	3.88875	2.55748
	cv	0.127718	0.174799	-5.4699	0.200577	0.213783	0.499649	0.035132
2	mean	12.6238	18.3948	1.06507	31.5012	7747.48	1.37065	83.983
	sd	0.922605	3.51362	0.113425	10.9375	761.333	0.343026	4.40949
	cv	0.073085	0.191011	0.106496	0.34721	0.098268	0.250266	0.052505
3	mean	10.8352	22.2481	-0.52754	73.2669	796.447	3.09959	88.596
	sd	0.670148	7.37231	0.710797	7.52507	311.741	1.29296	2.93119
	cv	0.061849	0.331368	-1.34739	0.102708	0.391414	0.417139	0.033085
4	mean	18.0908	24.4407	1.25348	40.6037	21246	3.22647	152.484
	sd	0.199233	1.60846	0.138053	2.1194	1907.32	0.162654	5.12701
	cv	0.011013	0.065811	0.110136	0.052197	0.089773	0.050412	0.033623
5	mean	18.5813	21.5331	0.366289	90.2885	23947.2	6.00505	100.653
	sd	0.730085	0.864243	0.217581	12.3713	1703.14	0.374825	2.23733
	cv	0.039291	0.040136	0.594014	0.13702	0.071121	0.062418	0.022228
6	mean	12.6746	32.537	0.93715	90.6847	869.94	1.74582	83.2466
	sd	1.78226	11.5764	0.141608	17.3781	449.582	1.16768	4.57197
	cv	0.140617	0.355792	0.151105	0.191632	0.516797	0.668845	0.054921
7	mean	18.4528	17.2356	2.25499	153.205	12498.6	11.0904	98.7615
	sd	2.13108	4.78896	0.262688	13.7417	1186.12	1.22793	2.41543
	cv	0.115488	0.277854	0.116492	0.089695	0.094901	0.11072	0.024457
8	mean	4.94416	22.6146	1.75443	35.0555	351.132	0.1081	44.7753
	sd	0.481467	1.78686	0.168844	5.54961	49.6904	0.02014	2.14587
	cv	0.097381	0.079014	0.096239	0.158309	0.141515	0.186312	0.047925
9	mean	20.2445	25.294	-0.40538	125.158	1440.09	1.14744	91.1879
	sd	0.920623	2.69298	0.08094	13.3945	422.958	0.672454	4.49461
	cv	0.045475	0.106467	-0.19967	0.107021	0.293702	0.586047	0.04929
10	mean	22.0564	20.0564	0.378437	156.37	22510.8	2.51299	134.368
	sd	0.606706	0.759457	0.180741	14.5266	1584.74	0.573275	22.2132
	cv	0.027507	0.037866	0.477598	0.092899	0.070399	0.228125	0.165316
11	mean	14.2114	20.6015	2.80877	114.876	3336.34	15.7502	75.1567
	sd	0.75691	3.22435	0.565711	9.26104	383.158	2.87613	6.89143
	cv	0.053261	0.156511	0.201409	0.080618	0.114844	0.182609	0.091694
12	mean	11.7332	17.9554	3.2038	43.5995	335.778	2.1584	22.543
	sd	1.71166	0.852452	0.161818	3.90303	16.3111	0.330868	5.69205
	cv	0.145882	0.047476	0.050508	0.08952	0.048577	0.153294	0.252498

13	mean	14.863	15.8305	2.02425	54.5723	1031.35	2.284	81.4151
	sd	1.09044	3.32062	0.141043	10.2123	60.6152	0.818605	5.01272
	cv	0.073366	0.209762	0.069677	0.187134	0.058772	0.358408	0.06157
14	mean	23.2665	22.6018	1.59981	85.4758	3643.45	4.31193	73.2333
	sd	3.4475	2.68556	0.491066	5.89365	641.681	1.08097	6.15508
	cv	0.148174	0.118821	0.306953	0.068951	0.176119	0.250692	0.084048
15	mean	19.9998	16.6672	1.36213	22.4086	3792.09	0.319714	104.045
	sd	0.550107	0.826529	0.16093	5.18617	206.798	0.146566	3.47084
	cv	0.027506	0.04959	0.118146	0.231436	0.054534	0.45843	0.033359
16	mean	16.4358	18.4513	-0.7416	116.946	1751.35	8.95051	97.3208
	sd	2.20543	5.48184	0.494869	18.9673	344.735	2.57175	8.12029
	cv	0.134185	0.297098	-0.6673	0.162188	0.19684	0.287331	0.083438
17	mean	20.9787	8.41494	1.93177	34.5786	111.25	0.205077	11.9325
	sd	4.06942	3.50785	0.960933	12.4919	4.23081	0.047011	3.16324
	cv	0.193979	0.416859	0.497438	0.361261	0.03803	0.229238	0.265095
18	mean	4.87728	16.6283	2.04608	109.088	327.914	9.17512	24.8717
	sd	0.811619	2.70717	0.396622	26.9177	86.8	4.62424	8.42407
	cv	0.166408	0.162805	0.193845	0.246752	0.264704	0.503997	0.338701
19	mean	9.56548	16.487	2.3267	41.3839	641.251	1.14262	26.8398
	sd	0.507573	2.25471	0.17108	2.01662	41.9264	0.255904	2.62456
	cv	0.053063	0.136757	0.073529	0.04873	0.065382	0.223964	0.097786
20	mean	19.5219	19.6896	0.958714	76.4302	23384.5	1.62391	104.155
	sd	0.716404	1.17574	0.086813	5.228	2105.92	0.171645	3.20157
	cv	0.036697	0.059714	0.090551	0.068402	0.090056	0.105698	0.030739
21	mean	17.5993	27.6222	1.79453	80.7875	1229.32	10.8719	69.6603
	sd	3.48878	9.5167	0.236688	10.948	179.918	3.53416	7.04181
	cv	0.198233	0.344531	0.131894	0.135517	0.146355	0.325071	0.101088
22	mean	11.5088	22.3062	1.22008	65.072	5094.02	1.65348	84.6607
	sd	0.866132	2.80796	0.224815	8.69547	540.559	0.187462	6.66376
	cv	0.075258	0.125882	0.184262	0.133628	0.106116	0.113374	0.078711
23	mean	14.7525	36.8807	0.775817	51.4831	1103.18	1.35724	66.336
	sd	0.82225	3.6595	0.204319	14.3452	359.699	0.103383	8.38324
	cv	0.055736	0.099225	0.26336	0.278639	0.326058	0.076171	0.126375
24	mean	18.5591	19.2764	1.57754	37.1887	2526.08	1.33864	72.7314
	sd	1.96455	3.6206	0.210905	1.4883	186.921	0.189591	7.25755
	cv	0.105853	0.187826	0.133692	0.04002	0.073997	0.141629	0.099786
25	mean	15.7746	24.7514	2.04442	132.185	1087.89	0.61024	40.0555
	sd	3.57755	3.52401	0.316487	7.96033	62.0473	0.159218	5.53228
	cv	0.226791	0.142376	0.154805	0.060221	0.057034	0.26091	0.138115
26	mean	13.6316	18.9032	2.11345	93.1759	4143.55	7.85112	68.7122

	sd	0.653964	1.2307	0.37859	8.30856	463.121	0.942478	12.3941
	cv	0.047974	0.065105	0.179133	0.089171	0.111769	0.120044	0.180376
27	mean	21.2293	21.3318	-0.42835	86.7208	5170.95	13.8986	87.263
	sd	2.48159	3.82321	1.67591	7.19178	824.468	3.69736	3.63924
	cv	0.116894	0.179226	-3.9125	0.08293	0.159442	0.266025	0.041704
28	mean	25.7328	19.9213	0.369942	84.5193	29804	2.21742	124.064
	sd	0.491372	1.18217	0.106208	10.6986	1937.51	0.259573	4.05199
	cv	0.019095	0.059342	0.287095	0.126582	0.065008	0.117061	0.032661
29	mean	28.9937	15.2498	2.38563	92.9205	797.061	1.23814	18.1548
	sd	2.33443	9.65758	0.65697	14.5685	42.9414	0.296445	4.49574
	cv	0.080515	0.633292	0.275387	0.156784	0.053875	0.239427	0.247633
30	mean	20.473	27.2118	0.040248	113.842	3721.61	19.1302	102.156
	sd	1.76799	2.86466	0.575371	8.61022	233.034	1.45744	7.42307
	cv	0.086357	0.105273	14.2957	0.075633	0.062616	0.076185	0.072664
31	mean	6.87549	17.9864	1.63042	75.9572	2749.19	11.2459	68.063
	sd	1.20223	2.12585	0.176687	6.3881	384.211	1.61391	6.2563
	cv	0.174858	0.118192	0.108369	0.084101	0.139754	0.143511	0.091919
32	mean	11.4029	20.3264	1.35452	57.7099	1427.55	1.6521	59.8904
	sd	0.883198	1.86446	0.265975	6.31914	128.305	0.467446	5.73427
	cv	0.077454	0.091726	0.196361	0.109498	0.089878	0.282941	0.095746
33	mean	11.6855	18.5573	1.88461	48.8143	1430.57	5.37633	84.7587
	sd	0.815922	1.62855	0.01838	9.74747	140.471	1.11969	4.26764
	cv	0.069824	0.087758	0.009753	0.199685	0.098192	0.208263	0.05035
34	mean	9.53234	16.7271	0.586959	67.046	2251.46	3.43119	57.8212
	sd	0.812294	1.38056	0.289837	6.27545	197.775	1.55173	6.98992
	cv	0.085215	0.082534	0.493794	0.093599	0.087843	0.452241	0.120889
35	mean	12.2206	21.7323	2.71886	37.969	133.821	2.93678	19.0699
	sd	3.0908	2.64515	0.167709	8.51609	17.8642	0.886365	6.65436
	cv	0.252916	0.121715	0.061683	0.224291	0.133493	0.301816	0.348947
36	mean	16.3168	18.797	0.729622	124.774	2151.39	21.2392	82.3354
	sd	0.702822	3.37588	0.189855	5.33157	126.074	2.12752	2.45109
	cv	0.043074	0.179596	0.26021	0.04273	0.058601	0.10017	0.02977
37	mean	21.6368	18.5827	0.296115	73.1769	23706.6	1.69552	118.364
	sd	0.86117	1.01764	0.069015	6.67724	2971.43	0.126147	6.84617
	cv	0.039801	0.054763	0.233068	0.091248	0.125342	0.0744	0.05784
38	mean	23.4199	19.0948	0.521646	51.2317	22342.1	2.33183	110.985
	sd	0.376108	1.16928	0.196779	3.7661	1478.71	0.290813	2.15859
	cv	0.016059	0.061236	0.377226	0.073511	0.066185	0.124715	0.019449
39	mean	10.6156	25.6417	2.31197	95.0429	4274.62	1.64203	50.1403
	sd	1.91144	4.44612	0.362241	4.49161	320.921	0.773328	4.54959

	cv	0.180059	0.173394	0.156681	0.047259	0.075076	0.470958	0.090737
40	mean	14.5866	19.5067	3.35412	100.109	325.024	12.8489	39.5613
	sd	2.218	2.43925	0.345708	12.1711	17.7645	2.50063	11.5552
	cv	0.152058	0.125047	0.10307	0.121578	0.054656	0.194618	0.292082
41	mean	12.0624	23.5383	-1.17762	69.39	755.54	4.17602	82.0465
	sd	4.02413	6.66125	0.281897	14.2607	226.393	0.868289	3.68947
	cv	0.333609	0.282996	-0.23938	0.205515	0.299643	0.207923	0.044968
42	mean	19.0371	19.6702	0.070671	65.51	22923.4	1.24276	100.236
	sd	0.492858	1.74087	0.139735	12.4823	1209.3	0.148047	1.91954
	cv	0.025889	0.088503	1.97726	0.190541	0.052754	0.119128	0.01915
43	mean	11.5597	24.8279	2.38102	90.6482	265.314	4.69627	40.0177
	sd	1.33857	4.68379	0.17624	15.5321	25.1988	2.54041	4.89468
	cv	0.115797	0.18865	0.074019	0.171345	0.094977	0.540941	0.122313
44	mean	16.4049	21.7061	0.453162	53.4257	12176.5	5.9806	95.4422
	sd	1.10756	2.97348	0.156027	5.77054	1725.29	1.22096	5.21116
	cv	0.067514	0.136988	0.344307	0.108011	0.14169	0.204153	0.0546
45	mean	16.5625	41.2187	0.603475	114.42	3793.32	22.3237	102.769
	sd	1.20113	9.08227	0.327346	10.3851	453.194	3.37985	5.14177
	cv	0.072521	0.220343	0.542436	0.090763	0.119472	0.151402	0.050033
46	mean	7.50396	17.4482	2.39613	56.7059	1715.49	2.69878	42.5794
	sd	1.83162	2.14764	0.088201	12.0552	81.2276	1.04068	9.57321
	cv	0.244087	0.123087	0.03681	0.212591	0.04735	0.38561	0.224832
47	mean	12.0455	18.9705	2.33858	68.3145	156.098	1.06406	17.7064
	sd	3.85443	6.02907	0.121343	14.7861	28.9987	0.155	0.00191
	cv	0.31999	0.317813	0.051888	0.216441	0.185772	0.145669	0.000108
48	mean	6.83651	15.6695	2.19335	52.7211	374.796	0.151941	23.5614
	sd	0.713675	3.48941	0.456946	10.3353	19.8675	0.093105	8.74067
	cv	0.104392	0.222688	0.208332	0.196038	0.053009	0.61277	0.370974
	sd	1.09483	5.30118	1.10031	11.8221	458.402	0.552503	1.97807
	sd	1.08828	1.86831	0.089219	6.64499	15.956	1.21331	5.32471
	sd	1.09831	3.40521	0.33441	7.61366	1860.36	0.440532	3.41399
	sd	5.8598	2.49278	0.898631	4.26503	2143.24	0.384535	3.85514
67	mean	18.301	17.5456	1.0954	93.3013	288.01	2.74152	86.4125
	sd	0.913292	4.12009	0.26796	17.4904	36.9912	2.50996	2.11363
68	mean	20.5765	24.1892	-0.86804	98.9177	3847.17	2.65564	93.9333
	sd	2.38037	5.64778	0.417875	8.00926	1245.7	0.894807	3.96282
	cv	0.115684	0.233483	-0.4814	0.080969	0.323798	0.336946	0.042188
69	mean	27.7608	44.5959	1.2981	148.968	432.492	2.91616	33.069
	sd	3.37177	14.2584	0.510236	13.1696	34.1946	0.605669	2.75236
	cv	0.121458	0.319725	0.393065	0.088405	0.079064	0.207694	0.083231

70	mean	20.9817	22.2408	-0.61799	110.016	3814.4	3.74905	97.8927
	sd	1.75563	2.41387	0.14336	10.9967	1029.13	0.864201	5.2735
	cv	0.083675	0.108533	-0.23198	0.099955	0.269801	0.230512	0.05387
71	mean	7.47654	17.6256	2.92197	60.138	246.208	3.5177	21.3093
	sd	1.64868	5.38158	0.132182	12.2739	10.2263	1.28993	5.22538
	cv	0.220514	0.305328	0.045237	0.204095	0.041535	0.366698	0.245216
72	mean	11.7079	27.5554	2.14873	202.902	4165.92	6.68725	66.4468
	sd	1.04394	9.04444	0.328375	12.0127	435.528	1.41933	4.25214
	cv	0.089165	0.328227	0.152823	0.059205	0.104545	0.212243	0.063993
73	mean	20.6158	32.2242	1.79219	163.864	2521.3	63.2084	61.4559
	sd	2.9512	7.70808	0.285265	7.6443	577.648	2.26574	15.1143
	cv	0.143152	0.239202	0.159171	0.04665	0.229107	0.035846	0.245937
74	mean	10.617	22.8277	2.85662	65.242	255.369	2.17923	22.9108
	sd	2.30409	2.95384	0.161749	7.17996	27.6244	0.995877	6.78629
	cv	0.21702	0.129397	0.056623	0.110051	0.108174	0.456985	0.296205
75	mean	20.0313	22.4216	0.692208	177.53	9577.82	19.7521	94.177
	sd	0.840468	4.34752	0.151942	12.9385	692.744	3.8797	6.92894
	cv	0.041958	0.193898	0.219503	0.07288	0.072328	0.196419	0.073574
76	mean	13.4758	24.0232	0.958475	124.122	3878.39	17.8565	78.4725
	sd	0.636761	1.78346	0.18948	6.70169	518.04	1.98502	8.18433
	cv	0.047252	0.074239	0.197689	0.053993	0.133571	0.111165	0.104295
77	mean	10.8041	19.7136	1.24522	58.6709	5779.85	1.69763	77.7351
	sd	0.75357	1.46839	0.26185	3.69435	486.404	0.334556	9.31925
	cv	0.069748	0.074486	0.210285	0.062967	0.084155	0.197073	0.119885
78	mean	17.7198	20.6231	-1.33331	129.577	384.143	4.13556	84.6822
	sd	5.22484	5.5392	0.420015	10.192	82.3036	0.481505	3.40322
	cv	0.294858	0.268593	-0.31502	0.078656	0.214252	0.116431	0.040188
79	mean	14.6489	29.4345	1.15946	123.12	502.202	6.27257	75.5226
	sd	1.92596	4.58576	0.217571	15.1706	84.2384	3.56907	13.839
	cv	0.131474	0.155796	0.187648	0.123218	0.167738	0.568996	0.183243
80	mean	18.0727	24.9537	1.31943	63.1439	1409.15	7.15813	44.1469
	sd	0.739108	3.21457	0.211256	7.686	167.543	2.25355	6.65922
	cv	0.040896	0.128821	0.160112	0.121722	0.118897	0.314824	0.150842
81	mean	9.13493	21.8378	2.51325	61.8345	259.689	1.80666	10.1813
	sd	1.63103	4.46656	0.369135	16.6823	52.2234	0.346773	4.60386
	cv	0.178549	0.204533	0.146875	0.26979	0.2011	0.191942	0.452189
82	mean	24.4536	20.6073	1.96663	95.2278	2209.03	7.786	58.7932
	sd	4.88074	2.10445	0.627523	9.69037	243.197	1.3104	1.58761
	cv	0.199592	0.102121	0.319086	0.10176	0.110093	0.168301	0.027003
83	mean	8.98632	20.4812	2.19295	51.5756	224.897	3.60374	40.4486

	sd	0.360378	1.18336	0.243086	6.95932	14.5186	1.27386	3.85992
	cv	0.040103	0.057778	0.110849	0.134934	0.064556	0.353482	0.095428
84	mean	23.4588	20.7225	0.48453	125.688	23748.2	2.87599	122.501
	sd	1.17676	1.33381	0.204608	9.13737	1824.71	0.184161	6.34301
	cv	0.050163	0.064365	0.422283	0.072699	0.076836	0.064034	0.051779
85	mean	17.7473	21.815	1.1946	60.3284	13608.3	4.33339	116.239
	sd	0.434834	1.26694	0.459207	4.43335	1097.27	0.657277	3.44375
	cv	0.024501	0.058076	0.384401	0.073487	0.080633	0.151677	0.029627
86	mean	11.1182	26.1844	1.58468	75.8354	772.178	2.62125	59.4081
	sd	0.876866	3.35344	0.335536	12.652	68.4221	0.577661	7.57408
	cv	0.078867	0.12807	0.211738	0.166835	0.088609	0.220376	0.127492
87	mean	12.827	12.2458	3.53686	41.3743	167.608	1.15323	8.14356
	sd	1.15625	3.41949	0.090767	1.95122	4.10957	0.319332	1.79452
	cv	0.090142	0.279237	0.025663	0.04716	0.024519	0.276903	0.220361
88	mean	20.8908	19.7823	0.63398	72.533	37721.7	1.50032	114.671
	sd	1.09802	2.17273	0.1504	2.71022	2959.59	0.202748	2.51336
	cv	0.05256	0.109832	0.237231	0.037365	0.078459	0.135137	0.021918
89	mean	22.3624	16.2363	1.963	92.0209	8594.6	2.10691	82.1651
	sd	2.307	3.62371	0.333657	6.36487	716.93	0.50274	7.43324
	cv	0.103164	0.223186	0.169972	0.069168	0.083416	0.238614	0.090467
90	mean	9.83309	16.6097	2.36976	33.7594	556.074	0.790468	28.9135
	sd	1.68706	2.17423	0.11945	3.30849	45.9323	0.138026	2.37609
	cv	0.171569	0.130901	0.050406	0.098002	0.082601	0.174613	0.082179
91	mean	13.332	19.3801	1.87916	149.61	4051.77	6.38422	68.973
	sd	0.995936	3.49966	0.136885	21.2587	492.347	1.70742	1.64245
	cv	0.074702	0.18058	0.072844	0.142094	0.121514	0.267443	0.023813
92	mean	11.1903	19.3675	2.04965	101.291	1391.21	1.37573	60.194
	sd	0.845638	2.10517	0.162739	13.9686	67.7778	0.296669	9.02555
	cv	0.075569	0.108696	0.079399	0.137906	0.048719	0.215645	0.149941
93	mean	10.0947	20.5246	1.48068	36.8532	2167.93	1.62741	88.3268
	sd	0.470443	2.45015	0.212417	6.83543	220.591	0.272113	7.42862
	cv	0.046603	0.119376	0.143458	0.185477	0.101752	0.167206	0.084104
94	mean	11.5546	18.6979	1.99584	99.5123	1011.35	2.79111	80.7318
	sd	1.38359	3.51075	0.124638	9.43789	93.6014	0.710671	3.92538
	cv	0.119743	0.187762	0.062449	0.094841	0.092551	0.25462	0.048622
95	mean	18.8711	20.5733	-0.0849	62.8481	4567.1	3.47219	100.572
	sd	0.384404	2.43995	0.208536	13.161	743.705	1.20648	2.30499
	cv	0.02037	0.118598	-2.45641	0.209409	0.16284	0.347469	0.022919
96	mean	19.4945	24.1237	0.455807	66.4693	10678.7	5.07291	103.412
	sd	1.18513	2.09546	0.167643	3.17596	728.868	0.283149	5.28034

	cv	0.060793	0.086863	0.367794	0.047781	0.068254	0.055816	0.051061
97	mean	9.90209	21.6317	-0.41153	70.3327	1944.79	1.23713	83.39
	sd	2.96115	2.93407	0.463426	8.42532	324.203	0.435458	3.50994
	cv	0.299043	0.135637	-1.1261	0.119792	0.166703	0.351992	0.042091
98	mean	17.5166	18.2762	-0.33038	57.2026	1989.01	1.46905	86.5506
	sd	1.77692	1.85168	0.153328	6.54141	446.761	0.401505	3.63071
	cv	0.101442	0.101317	-0.4641	0.114355	0.224615	0.27331	0.041949
99	mean	11.4375	17.7347	4.10372	33.8483	236.547	1.38521	12.8841
	sd	1.23358	2.8284	3.46797	2.89629	27.1356	0.606779	2.84453
	cv	0.107854	0.159484	0.845078	0.085567	0.114715	0.43804	0.220778
100	mean	12.4372	23.5934	2.65053	65.8224	481.167	3.58351	18.8719
	sd	1.57244	3.80282	0.044116	3.77349	31.8392	0.227731	3.97935
	cv	0.12643	0.161181	0.016644	0.057328	0.066171	0.06355	0.210862
101	mean	25.3076	28.6388	1.07678	169.992	7137.54	36.2164	109.095
	sd	4.02767	9.64901	1.13492	34.6501	574.223	4.1758	4.70964
	cv	0.159149	0.336921	1.05399	0.203833	0.080451	0.115301	0.04317
102	mean	13.078	9.49561	2.32539	50.2845	199.723	4.34734	28.8779
	sd	2.57445	4.50561	1.5851	10.3177	36.6473	2.40149	3.89482
	cv	0.196853	0.474494	0.68165	0.205187	0.183491	0.552404	0.134872
103	mean	10.4461	29.4811	2.26328	412.402	23291.7	4.95571	.
	sd	1.15734	6.58478	1.58487	35.3733	3248.27	0.45883	.
	cv	0.110792	0.223356	0.700254	0.085774	0.13946	0.092586	.
104	mean	20.4751	28.0973	0.071618	143.417	4137.89	2.73213	90.6233
	sd	1.71643	3.67059	0.127478	19.9674	747.704	0.425487	4.37969
	cv	0.08383	0.130638	1.77996	0.139227	0.180697	0.155735	0.048329
105	mean	18.6437	24.7355	0.112197	113.024	10387.9	5.24498	99.6393
	sd	0.46881	1.67614	0.199152	13.0702	1621.75	0.433244	5.95012
	cv	0.025146	0.067762	1.77502	0.115641	0.156118	0.082602	0.059717
106	mean	27.7039	8.26987	2.63535	80.6257	1116.46	1.50622	27.2568
	sd	6.67111	3.11071	0.163767	19.3411	180.457	0.728636	4.26091
	cv	0.240801	0.37615	0.062143	0.239887	0.161633	0.483751	0.156324
107	mean	18.9144	16.4954	1.71595	54.009	3180.81	2.89666	91.0126
	sd	0.535032	1.55998	0.623168	6.46298	248.698	0.648726	4.82587
	cv	0.028287	0.094571	0.363161	0.119665	0.078187	0.223956	0.053024
108	mean	17.6296	25.8875	1.0221	54.9416	14397.5	4.98265	114.635
	sd	0.448271	3.30751	0.630205	4.81186	1429.99	0.408463	3.59753
	cv	0.025427	0.127765	0.61658	0.087581	0.099322	0.081977	0.031382
109	mean	11.7852	23.9995	0.852549	77.8503	887.491	2.74522	84.2522
	sd	1.99036	2.40865	0.262666	5.0468	130.73	0.620706	4.25156
	cv	0.168886	0.100363	0.308094	0.064827	0.147303	0.226104	0.050462

110	mean	19.7492	45.5569	1.41201	117.809	7576.18	23.0114	96.5328
	sd	1.03158	4.83204	2.1669	7.68855	614.351	4.10418	7.16054
	cv	0.052234	0.106066	1.53462	0.065263	0.08109	0.178354	0.074177
111	mean	18.5515	25.4247	1.255	123.746	4265.19	39.4625	79.6027
	sd	2.1562	3.67638	0.360908	8.91759	263.984	3.72874	8.05667
	cv	0.116228	0.144599	0.287575	0.072064	0.061893	0.094488	0.101211
112	mean	21.1091	31.7215	0.066907	116.352	3221.49	23.4204	72.0802
	sd	3.67373	2.29052	0.100933	7.87706	553.873	1.66433	3.46599
	cv	0.174036	0.072207	1.50857	0.0677	0.171931	0.071063	0.048085
113	mean	9.73696	13.4042	2.28357	31.4436	376.872	0.19501	29.6355
	sd	4.24886	4.57374	0.227883	10.3078	62.7195	0.235875	4.72827
	cv	0.436364	0.341216	0.099792	0.327819	0.166421	1.20955	0.159548
114	mean	28.9872	20.4681	1.31836	64.8432	2096.26	1.7951	75.0105
	sd	5.12793	5.11675	0.132382	11.3685	211.524	0.718718	2.90148
	cv	0.176903	0.249987	0.100414	0.175323	0.100906	0.400378	0.038681
115	mean	17.2788	17.0705	1.49005	167.959	1371.04	2.68639	45.9608
	sd	2.14273	2.54628	0.694998	25.3354	112.309	1.01493	3.75606
	cv	0.124009	0.149162	0.466425	0.150842	0.081915	0.377804	0.081723
116	mean	26.6952	16.8787	0.315302	83.2166	27869.9	2.20928	128.08
	sd	0.475509	1.00279	0.228516	7.83289	2984.01	0.392215	22.6044
	cv	0.017813	0.059412	0.724753	0.094127	0.107069	0.177531	0.176487
117	mean	11.5617	21.7642	0.588501	81.4056	34509.8	3.1629	93.5177
	sd	0.318729	0.794705	0.189986	9.02344	1658.82	0.2049	1.74636
	cv	0.027568	0.036514	0.32283	0.110845	0.048068	0.064782	0.018674
118	mean	12.3913	21.9464	2.804	69.2306	1213.11	6.02557	54.0596
	sd	1.50212	2.58161	0.404312	6.77765	32.9705	1.09719	13.3768
	cv	0.121224	0.117632	0.144191	0.0979	0.027178	0.182089	0.247445
119	mean	11.9666	17.0504	2.69407	46.7814	285.015	6.08643	5.73342
	sd	3.04034	1.4991	0.149799	7.35199	33.403	1.26708	0.386603
	cv	0.254069	0.087922	0.055603	0.157156	0.117197	0.208182	0.06743
120	mean	11.2417	28.028	0.902641	119.833	2143.65	7.38874	70.9478
	sd	0.945592	6.90913	0.208829	23.1127	235.27	1.05146	9.12302
	cv	0.084115	0.246508	0.231354	0.192875	0.109752	0.142306	0.128588
132	mean	14.6275	22.259	3.13216	82.318	520.501	0.897612	44.5039
	sd	1.43512	3.60932	0.357464	11.2464	27.77	0.340939	2.27987
	cv	0.098111	0.162151	0.114127	0.136622	0.053352	0.379829	0.051229
133	mean	13.4032	18.288	2.53685	70.4469	328.024	1.69756	26.8694
	sd	3.3372	4.85459	0.259898	5.45893	21.6676	0.912007	7.03199
	cv	0.248986	0.265453	0.102449	0.07749	0.066055	0.537245	0.26171

10.2 **Some statistics of variables by Country code.**

countrycode	stats	GDPPER	TOA	POP	Trade	netsize	pca	health
1	mean	1257.71	493846	3.10E+06	59.7779	3.112304	-1.27024	5.56163
	sd	263.853	298682	33603.3	12.2184	5.449923	0.47567	1.13396
	cv	0.209788	0.604808	0.010803	0.204396	1.75109	-0.37447	0.20389
2	mean	1882.41	1.00E+06	3.10E+07	59.7993	0.343345	-2.2719	3.65913
	sd	178.356	403089	1.80E+06	8.29713	0.454276	0.637466	0.353496
	cv	0.094748	0.398007	0.057927	0.13875	1.323088	-0.28059	0.096607
5	mean	10972.4	233846	78328.8	133.846	36.88907	1.780878	4.76853
	sd	1395.45	16051.2	5666.09	26.2696	44.6108	0.159924	0.22075
	cv	0.127178	0.06864	0.072337	0.196267	1.209323	0.089801	0.046293
6	mean	7749.95	3.10E+06	3.70E+07	31.5057	1.326459	-0.45807	8.51484
	sd	770.334	665802	1.50E+06	10.9431	1.219623	0.80002	0.471647
	cv	0.099399	0.211438	0.039078	0.347338	0.919458	-1.74649	0.055391
7	mean	796.044	164000	3.10E+06	73.691	2.73111	-1.02364	5.47235
	sd	311.285	162713	50516.4	7.45298	2.583861	0.330873	0.751657
	cv	0.39104	0.992155	0.016309	0.101138	0.946085	-0.32323	0.137355
9	mean	21923.7	4.80E+06	1.90E+07	39.4587	1.015873	3.907328	8.0531
	sd	2030.44	593921	946772	1.93975	0.681519	0.245808	0.476005
	cv	0.092614	0.124333	0.048659	0.049159	0.67087	0.062909	0.059108
10	mean	23811.3	1.80E+07	8.10E+06	90.7033	34.57082	4.045174	10.0713
	sd	1920.1	1.30E+06	124250	12.9917	22.59921	0.075942	0.285589
	cv	0.080638	0.0724	0.015373	0.143233	0.653708	0.018774	0.028357
11	mean	869.937	740000	8.10E+06	90.6847	3.829124	-2.25242	5.79957
	sd	449.582	138071	278813	17.3779	5.779533	0.135469	1.13023
	cv	0.516798	0.186582	0.034352	0.19163	1.509362	-0.06014	0.194881
13	mean	13042.2	2.80E+06	666817	153.866	130.515	0.591999	4.22562

	sd	1239.35	1.20E+06	101629	13.3527	124.3686	0.486209	0.40537
	cv	0.095026	0.434577	0.152409	0.086781	0.952907	0.8213	0.095931
14	mean	382.485	205769	1.30E+08	35.0555	3.741216	-2.11252	3.10434
	sd	54.7854	40462.2	8.80E+06	5.54961	6.169389	0.512719	0.290905
	cv	0.143235	0.196639	0.066576	0.158309	1.649033	-0.2427	0.093709
15	mean	9100.12	515923	267883	114.586	155.9405	3.032564	6.59338
	sd	499.717	42496	2655.87	7.55033	165.6894	0.162782	0.480069
	cv	0.054913	0.082369	0.009914	0.065892	1.062516	0.053678	0.072811
16	mean	1440.17	129308	1.00E+07	125.159	2.501504	-2.51029	6.44224
	sd	423.115	94380.8	162699	13.3948	3.532511	0.173319	0.266275
	cv	0.293796	0.729893	0.016347	0.107022	1.412155	-0.06904	0.041333
17	mean	22549.3	6.40E+06	1.00E+07	144.395	114.3548	3.316202	8.73093
	sd	1620.84	443983	155882	11.2168	87.23407	0.146342	0.97777
	cv	0.07188	0.068884	0.015098	0.077682	0.762837	0.044129	0.111989
18	mean	3316.82	195846	260260	114.91	0.611515	0.142528	4.25023
	sd	383.004	41323.6	30545.5	9.15891	0.494484	0.35584	0.374913
	cv	0.115473	0.211	0.117365	0.079705	0.808622	2.496642	0.08821
19	mean	343.926	139077	6.80E+06	43.1867	0.467921	-0.57548	4.54505
	sd	19.0152	41298.6	802853	4.64414	0.460952	0.275765	0.16488
	cv	0.055289	0.296948	0.118196	0.107536	0.985105	-0.47919	0.036277
20	mean	56073.7	321538	62648.6	65.6738	532.7282	2.796605	.
	sd	7449.51	49410.9	816.865	2.79051	251.9071	0.126592	.
	cv	0.132852	0.15367	0.013039	0.04249	0.472862	0.045266	.
22	mean	1026	398077	8.50E+06	54.951	0.250062	-1.03186	5.36249
	sd	50.2774	96429.1	650492	10.8612	0.265296	0.67737	0.742233
	cv	0.049003	0.242237	0.076758	0.197653	1.060922	-0.65645	0.138412
23	mean	1495.6	183091	3.60E+06	108.266	6.098415	-1.21504	8.50939

	sd	435.243	56339.1	191618	10.4228	8.065843	0.280731	1.30344
	cv	0.291015	0.307711	0.052766	0.09627	1.322613	-0.23105	0.153177
24	mean	3343.67	1.10E+06	1.80E+06	86.6267	0.078551	1.771666	5.41527
	sd	559.911	415769	107987	6.59201	0.058298	0.155446	1.37132
	cv	0.167454	0.376157	0.060955	0.076097	0.742168	0.08774	0.253233
25	mean	3791.38	4.30E+06	1.80E+08	22.3619	2.249375	-0.0253	7.31086
	sd	213.946	1.10E+06	9.20E+06	5.15551	2.471454	0.216654	0.637848
	cv	0.05643	0.260965	0.052175	0.230549	1.098729	-8.56316	0.087247
27	mean	1783.98	3.70E+06	8.00E+06	113.653	7.701015	0.403058	6.41632
	sd	374.673	984517	273327	13.075	7.666138	0.488982	1.04477
	cv	0.210021	0.268835	0.034064	0.115043	0.995471	1.21318	0.16283
28	mean	220.627	173615	1.30E+07	35.5758	0.136318	-0.87295	5.53168
	sd	24.5342	59773.9	1.40E+06	3.65035	0.138692	0.152613	1.12216
	cv	0.111202	0.344289	0.111176	0.102608	1.017414	-0.17482	0.202861
29	mean	112.986	67333.3	6.70E+06	34.5786	0.612361	-3.46233	7.37471
	sd	4.16446	61485.2	544027	12.4919	0.761742	0.44919	2.23175
	cv	0.036858	0.913146	0.081518	0.361261	1.243943	-0.12974	0.302621
30	mean	331.32	1.40E+06	1.30E+07	109.087	0.153243	-2.08315	6.70815
	sd	91.9266	377184	805063	26.9167	0.13835	0.153225	1.21266
	cv	0.277455	0.260847	0.064098	0.246744	0.902814	-0.07355	0.180773
32	mean	23385.5	1.90E+07	3.10E+07	75.7626	1.625719	3.994459	9.36351
	sd	2105.67	1.00E+06	1.10E+06	5.54791	0.932257	0.10815	0.478814
	cv	0.090042	0.054871	0.036785	0.073228	0.573443	0.027075	0.051136
33	mean	1257.41	124462	442965	93.2919	4.282392	0.953644	4.99396
	sd	267.609	78132	29031.4	15.5096	3.24691	0.297853	0.204721
	cv	0.212825	0.62776	0.065539	0.166248	0.7582	0.312331	0.040994
37	mean	5088.94	1.80E+06	1.60E+07	65.0904	3.677139	-0.27842	7.00143

	sd	537.306	314656	717009	8.72498	3.050929	0.149982	0.49997
	cv	0.105583	0.177171	0.046041	0.134044	0.829702	-0.5387	0.07141
38	mean	1110.46	3.40E+07	1.30E+09	50.3442	6.135901	-1.762	4.42092
	sd	372.861	1.10E+07	3.60E+07	13.5054	6.885508	0.280512	0.397345
	cv	0.335772	0.323313	0.028714	0.268261	1.122167	-0.1592	0.089878
39	mean	2661.38	857385	4.00E+07	35.7285	2.476009	-2.27071	6.88329
	sd	176.22	450896	2.60E+06	1.42641	2.85076	0.249977	1.28206
	cv	0.066214	0.525897	0.063428	0.039923	1.151353	-0.11009	0.186258
43	mean	4155.83	1.20E+06	4.00E+06	93.1591	10.27146	0.800534	7.34551
	sd	467.516	386790	320854	8.28845	8.981618	0.483335	0.662861
	cv	0.112496	0.319053	0.080536	0.088971	0.874425	0.603766	0.09024
45	mean	5183.78	5.80E+06	4.50E+06	86.3515	13.03346	2.241868	6.90387
	sd	836.003	2.20E+06	73291	6.67613	12.01281	0.169873	0.523698
	cv	0.161273	0.384479	0.016345	0.077313	0.92169	0.075773	0.075856
47	mean	13448.9	2.30E+06	961190	102.259	21.8774	2.511885	5.86735
	sd	1127.03	219052	68335.8	4.31341	16.23783	0.198812	0.559325
	cv	0.083801	0.09326	0.071095	0.042181	0.742219	0.079148	0.095328
48	mean	5905.55	9.10E+06	1.00E+07	125.989	27.58109	-3.69779	6.61476
	sd	760.945	426385	45428.2	17.2163	24.28686	0.481748	0.263172
	cv	0.128852	0.047018	0.004424	0.13665	0.880562	-0.13028	0.039786
49	mean	29759.9	4.40E+06	5.40E+06	84.2756	61.81909	4.462629	9.0458
	sd	1889.2	2.90E+06	69792.2	10.6069	41.18372	0.154454	0.715487
	cv	0.063481	0.660194	0.013037	0.12586	0.666198	0.034611	0.079096
52	mean	2799.86	2.90E+06	8.70E+06	75.7776	11.30878	-0.70775	5.70578
	sd	399.464	735115	523508	6.62874	11.66992	0.196822	0.514846
	cv	0.142673	0.252084	0.059991	0.087476	1.031934	-0.2781	0.090232
53	mean	1417.43	666231	1.30E+07	58.0563	1.584681	-1.72843	5.63349

	sd	117.044	163791	803436	6.71866	1.662597	0.407584	1.49743
	cv	0.082575	0.245847	0.063832	0.115727	1.049168	-0.23581	0.265809
54	mean	1483.46	5.60E+06	6.90E+07	48.8142	3.12817	-1.16406	5.16103
	sd	150.431	2.40E+06	4.90E+06	9.74732	4.285751	0.299877	0.59661
	cv	0.101405	0.431837	0.070238	0.199682	1.370051	-0.25761	0.115599
55	mean	2253.11	757615	5.90E+06	66.5743	6.725471	-0.58826	7.41433
	sd	198.428	351284	112078	5.74906	6.01894	0.198714	0.658446
	cv	0.088069	0.46367	0.018846	0.086356	0.894947	-0.3378	0.088807
58	mean	4781.71	1.30E+06	1.40E+06	152.642	10.5338	2.331383	5.43565
	sd	1436.45	504191	29653.3	9.94394	7.550958	0.355753	0.598217
	cv	0.300406	0.395539	0.021608	0.065146	0.716831	0.152593	0.110054
59	mean	134.161	170077	6.70E+07	37.9451	0.075178	-2.41469	4.03192
	sd	18.6462	68010.4	6.70E+06	8.49555	0.097114	0.241806	0.720579
	cv	0.138983	0.39988	0.099646	0.223891	1.291792	-0.10014	0.178718
60	mean	2139.69	415923	809714	122.523	1.887113	-0.30227	3.42895
	sd	140.083	90460.4	17132.2	6.04786	1.847529	0.476261	0.274671
	cv	0.065469	0.217493	0.021158	0.049361	0.979024	-1.57561	0.080104
61	mean	23709.8	2.90E+06	5.20E+06	73.8531	8.284219	3.947882	7.84249
	sd	3048.07	343919	55098.9	6.79653	4.463428	0.221629	0.402769
	cv	0.128557	0.118642	0.010612	0.092028	0.538787	0.056139	0.051357
62	mean	21634.8	7.30E+07	6.10E+07	51.674	27.71329	3.21376	10.5713
	sd	1341.01	6.20E+06	1.50E+06	3.83068	23.04148	0.105253	0.420312
	cv	0.061984	0.085465	0.024236	0.074132	0.831423	0.032751	0.03976
66	mean	790.556	421462	4.40E+06	69.3823	1.586449	-1.67267	7.62329
	sd	215.569	289742	121104	14.249	1.911713	0.784086	1.09703
	cv	0.272681	0.687469	0.027248	0.20537	1.205026	-0.46876	0.143905
67	mean	22859.7	1.90E+07	8.20E+07	65.6458	89.09857	3.78207	10.5056

	sd	1252.81	3.00E+06	262750	12.8931	66.0352	0.133652	0.232455
	cv	0.054804	0.162601	0.003195	0.196403	0.741148	0.035338	0.022127
69	mean	12022.8	1.30E+07	1.10E+07	55.1727	11.81948	1.924874	8.89066
	sd	1660.05	2.30E+06	169961	6.14528	10.14478	0.201384	0.562616
	cv	0.138076	0.175667	0.015535	0.111383	0.85831	0.104622	0.063282
70	mean	4800.59	121231	101806	96.6438	30.17459	1.198515	6.75395
	sd	747.978	12404	937.261	17.1113	27.89061	0.181231	0.636779
	cv	0.15581	0.102317	0.009206	0.177055	0.924308	0.151213	0.094282
72	mean	1714.22	936231	1.20E+07	56.7649	3.257609	-1.18762	5.55174
	sd	81.5219	362495	1.10E+06	12.1122	3.32857	0.098576	1.36269
	cv	0.047556	0.387185	0.093987	0.213375	1.021783	-0.083	0.245454
76	mean	406.49	153385	8.80E+06	48.299	8.963947	-3.31105	5.73126
	sd	17.3136	72004.1	563536	9.41375	10.61051	0.478263	0.562294
	cv	0.042593	0.469435	0.064246	0.194906	1.183687	-0.14444	0.09811
77	mean	1197.61	505154	6.40E+06	115.603	1.899313	-1.41613	6.94447
	sd	100.078	188563	510847	16.6407	2.083528	0.125892	1.20465
	cv	0.083565	0.373279	0.080378	0.143947	1.09699	-0.0889	0.173469
78	mean	26798.8	1.10E+07	6.70E+06	312.638	2255.386	3.0158	.
	sd	3460.53	3.60E+06	206591	58.3542	1469.72	0.651374	.
	cv	0.12913	0.314391	0.031061	0.186651	0.651649	0.215987	.
79	mean	4809.94	1.00E+07	1.00E+07	129.883	20.83761	2.348663	7.60837
	sd	732.19	1.60E+06	94342.6	21.5714	20.38102	0.177405	0.575976
	cv	0.152224	0.155602	0.00926	0.166083	0.978088	0.075534	0.075703
80	mean	31617.5	723417	285101	74.4049	1.644613	4.236406	9.50851
	sd	3899.31	181669	13613.2	4.04101	0.906663	0.497543	0.690739
	cv	0.123328	0.251126	0.047749	0.054311	0.551293	0.117445	0.072644
81	mean	473.69	3.00E+06	1.10E+09	30.8067	4.712219	-0.41645	4.20106

	sd	92.2845	940619	6.80E+07	8.46708	4.966889	0.116893	0.212381
	cv	0.19482	0.314929	0.063468	0.274845	1.054045	-0.28069	0.050554
82	mean	845.641	4.90E+06	2.20E+08	62.3468	2.412919	-1.75256	2.34445
	sd	78.0971	338088	1.10E+07	11.8359	2.4098	0.500428	0.402625
	cv	0.092353	0.06836	0.0499	0.18984	0.998708	-0.28554	0.171736
83	mean	1676.47	1.40E+06	6.60E+07	44.1403	1.685623	-2.21282	4.89846
	sd	232.112	638218	3.80E+06	10.2775	1.783988	0.391039	0.721545
	cv	0.138453	0.447703	0.057473	0.232838	1.058355	-0.17672	0.1473
85	mean	25378	6.50E+06	3.90E+06	157.125	14.63343	3.749591	6.82082
	sd	4768.45	997059	244110	13.8621	12.33749	0.150789	0.622571
	cv	0.187897	0.152457	0.062426	0.088224	0.843103	0.040215	0.091275
86	mean	19202.3	1.80E+06	6.40E+06	73.5058	56.10559	1.400764	7.7487
	sd	1112.69	493802	533893	8.88627	43.10313	0.369379	0.169513
	cv	0.057946	0.274124	0.083491	0.120892	0.76825	0.263698	0.021876
87	mean	19177.1	3.80E+07	5.80E+07	50.0905	42.16419	1.907549	8.11517
	sd	883.656	3.60E+06	906229	3.92461	29.82961	0.313175	0.572418
	cv	0.046079	0.096213	0.015746	0.07835	0.707463	0.164177	0.070537
88	mean	3629.37	1.30E+06	2.60E+06	99.2994	16.46964	-0.04489	4.77418
	sd	138.467	180831	60357.6	8.57974	16.62478	0.234708	0.561025
	cv	0.038152	0.134609	0.02327	0.086403	1.00942	-5.22839	0.117512
89	mean	37356.3	5.30E+06	1.30E+08	22.8333	1292.169	2.732524	7.62525
	sd	1599.08	1.50E+06	834212	4.96012	901.4214	0.282092	0.520797
	cv	0.042806	0.279659	0.00657	0.217232	0.697603	0.103235	0.068299
90	mean	1900.43	2.10E+06	4.90E+06	122.89	3.894627	0.167764	9.05174
	sd	226.688	825041	469984	13.8277	4.010527	0.201496	0.607533
	cv	0.119282	0.392015	0.095354	0.112521	1.029759	1.201068	0.067118
91	mean	1497.25	2.80E+06	1.50E+07	87.4216	0.08195	-1.70095	4.08968

	sd	458.402	812195	311589	11.8713	0.079427	0.233908	0.463019
	cv	0.306162	0.293768	0.020542	0.135794	0.969208	-0.13752	0.113216
92	mean	418.64	1.10E+06	3.20E+07	57.687	1.302877	-1.85003	4.39138
	sd	16.2752	287385	3.30E+06	6.71083	1.816844	0.201761	0.180415
	cv	0.038876	0.272701	0.101079	0.116332	1.394486	-0.10906	0.041084
94	mean	11956.8	5.00E+06	4.70E+07	71.133	209.8312	1.518261	4.83171
	sd	1860.36	940080	1.10E+06	7.61366	153.917	0.387072	0.844665
	cv	0.15559	0.187244	0.023636	0.107034	0.733528	0.254944	0.174817
96	mean	288.331	311615	4.90E+06	93.4926	1.404593	.	5.91602
	sd	35.8586	455811	226597	17.9861	1.367304	.	0.770174
	cv	0.124366	1.46274	0.045938	0.19238	0.973452	.	0.130185
97	mean	349.033	357154	5.40E+06	72.9962	0.12417	-2.62225	4.5249
	sd	61.0354	326564	363599	9.8232	0.140268	0.375608	0.9065
	cv	0.17487	0.91435	0.067468	0.134571	1.12965	-0.14324	0.200336
98	mean	3853.68	858538	2.40E+06	99.0515	8.377557	1.430829	6.32133
	sd	1238.33	390211	66678.3	8.09682	8.005681	0.482456	0.326608
	cv	0.321336	0.454506	0.028194	0.081744	0.95561	0.337186	0.051668
99	mean	4855.97	829615	3.80E+06	59.9996	27.45424	-1.08842	9.4848
	sd	265.611	272610	221151	7.87114	22.39534	0.537582	1.33083
	cv	0.054698	0.328598	0.058003	0.131187	0.815733	-0.49391	0.140312
100	mean	388.844	191429	2.00E+06	161.171	0.813119	-0.51332	7.48511
	sd	31.4475	93555.4	100040	16.7826	0.895516	0.114773	0.63912
	cv	0.080874	0.488722	0.05076	0.104129	1.101335	-0.22359	0.085386
103	mean	3816.59	1.40E+06	3.50E+06	109.214	10.21759	1.621409	6.03884
	sd	1040.16	437523	79855.6	11.0439	9.773873	0.379701	0.359874
	cv	0.272535	0.314747	0.022865	0.101122	0.956573	0.234179	0.059593
104	mean	46086.5	844462	442230	259.042	65.22876	4.07567	6.93459

	sd	6399.64	61640.9	22630.3	38.3083	51.26056	0.395144	1.09183
	cv	0.138861	0.072994	0.051173	0.147884	0.785858	0.096952	0.157447
106	mean	1762.5	164615	2.00E+06	97.0749	9.930593	-0.89592	8.68494
	sd	160.726	40504.2	27317.6	14.9141	10.67137	0.349976	0.801498
	cv	0.091192	0.246054	0.01358	0.153635	1.074595	-0.39063	0.092286
107	mean	244.111	170077	1.60E+07	61.3255	0.094136	-0.48666	3.54342
	sd	9.93462	92590	1.90E+06	13.6478	0.075935	0.215334	0.381
	cv	0.040697	0.544401	0.119383	0.222546	0.806654	-0.44247	0.107523
108	mean	151.927	354308	1.20E+07	66.6972	0.371435	-0.92914	6.24549
	sd	5.96994	175350	1.20E+06	7.98373	0.393446	0.337344	1.40889
	cv	0.039295	0.494908	0.10456	0.119701	1.059261	-0.36307	0.225586
109	mean	4122.03	1.20E+07	2.40E+07	202.793	19.99569	1.031231	3.39892
	sd	410.661	4.90E+06	2.10E+06	11.983	16.3902	0.176871	0.487254
	cv	0.099626	0.418446	0.086932	0.05909	0.819687	0.171514	0.143355
110	mean	2485.97	470231	277176	146.995	45.47278	0.259378	6.22556
	sd	587.068	113770	17722	21.3178	49.41902	0.554724	0.556015
	cv	0.236152	0.241944	0.063938	0.145023	1.086782	2.138672	0.089312
112	mean	9675.84	1.20E+06	389595	170.657	271.1646	2.744178	7.3538
	sd	692.543	52092	13877.8	10.543	219.1735	0.489488	1.2287
	cv	0.071574	0.045059	0.035621	0.061779	0.808268	0.178373	0.167084
115	mean	3862.23	650462	1.20E+06	124.74	57.152	0.931795	3.99847
	sd	482.068	132675	45859.4	7.44017	41.02165	0.150071	0.553904
	cv	0.124816	0.203971	0.038339	0.059645	0.717764	0.161056	0.138529
116	mean	5644.19	2.00E+07	1.00E+08	58.5766	4.706617	-0.14004	5.3732
	sd	439.105	1.00E+06	5.40E+06	3.7269	4.318682	0.368477	0.443452
	cv	0.077798	0.051133	0.053773	0.063624	0.917577	-2.63124	0.08253
120	mean	521.462	211308	2.40E+06	110.823	0.011254	-0.48042	4.66378

	sd	89.245	123440	101098	15.6524	0.012867	0.079599	1.0081
	cv	0.171144	0.584171	0.041338	0.141237	1.14337	-0.16569	0.216154
121	mean	1706.85	350000	633274	101.941	14.33252	-0.50475	8.02197
	sd	199.825	323768	6825.68	16.6628	2.326695	0.353157	0.624668
	cv	0.117073	0.925051	0.010778	0.163455	0.162337	-0.69966	0.07787
122	mean	1377.18	4.50E+06	2.90E+07	63.135	4.000252	-0.38925	4.60157
	sd	166.166	1.50E+06	1.30E+06	7.66403	5.592874	0.315944	0.651081
	cv	0.120657	0.333266	0.045275	0.121391	1.398131	-0.81166	0.141491
123	mean	258.194	541143	1.90E+07	61.9214	0.09446	-0.8432	5.68628
	sd	50.2104	148303	1.90E+06	17.0019	0.098907	0.249416	0.830053
	cv	0.194468	0.274055	0.101585	0.274572	1.047076	-0.2958	0.145975
125	mean	2177.17	655231	1.90E+06	95.1923	0.053151	0.684486	6.63978
	sd	213.385	170209	162231	10.416	0.047274	0.235367	0.409735
	cv	0.09801	0.25977	0.084452	0.10942	0.889428	0.34386	0.061709
126	mean	224.538	403385	2.50E+07	51.7568	0.756364	-1.40923	5.65344
	sd	13.584	68690.8	2.20E+06	7.01769	0.894769	0.502068	0.416283
	cv	0.060498	0.170286	0.088818	0.13559	1.182987	-0.35627	0.073634
127	mean	23800.1	9.20E+06	1.60E+07	125.342	230.5424	.	8.91418
	sd	1905.99	1.40E+06	330443	8.58663	138.6754	.	0.978033
	cv	0.080083	0.151629	0.020673	0.068506	0.601518	.	0.109717
129	mean	13804.6	2.00E+06	3.90E+06	59.2755	6.741813	4.315951	7.80819
	sd	1137.45	343621	179421	4.24196	3.627232	0.117914	0.549664
	cv	0.082396	0.168731	0.045569	0.071563	0.53802	0.027321	0.070396
130	mean	780.435	512231	5.10E+06	76.1421	0.643	-1.18342	7.70208
	sd	74.4397	165067	296369	13.2027	0.565109	0.187469	0.718832
	cv	0.095382	0.322251	0.05779	0.173396	0.878863	-0.15841	0.09333
131	mean	395.694	874846	1.30E+08	76.4144	2.385228	-2.82433	5.63909

	sd	41.4394	170986	1.20E+07	6.92937	3.830391	0.208232	1.01142
	cv	0.104726	0.195447	0.094074	0.090682	1.605881	-0.07373	0.179359
134	mean	37676.7	3.30E+06	4.50E+06	72.2441	7.27702	4.170915	9.06104
	sd	2891.24	508287	109568	2.51695	4.797278	0.099266	0.520509

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