Determinants of Tourism and its Potential for Sustainable Economic Development: Empirical Evidence

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Deutsche Zusammenfassung

Die vorliegende Dissertation befasst sich mit den Determinanten von Tourismus und dem Einfluss, den dieser Teilbereich des Servicehandels auf die Entwicklungsprozesse in einzelnen Ländern haben kann.

Es ist wohl unbestritten, dass neben dem verfügbaren Einkommen auch andere Faktoren, wie beispielsweise persönliche Einstellungen und Prägungen, genau wie die politische Umgebung die Konsumnachfrage beeinflussen. Dabei ist zu vermuten, dass dies in besonderem Maße auch auf so ein heterogenes Gut wie Tourismus zutrifft. Den Anspruch, dieses zu untersuchen, stellt sich die vorliegende Arbeit. Dabei werden sowohl die (insbesondere nichtökonomischen) Determinanten der Nachfrage- als auch der Angebotsseite des Gutes Tourismus, oder in anderen Worten, die Nachfragefaktoren in den Heimat- und den Zielländern, untersucht. Dabei liegt der Fokus insbesondere auf der Frage, ob und wie eine intakte Natur in den Zielländern die Attraktivität dieser für potenzielle Touristen erhöhen kann. Damit leistet die Arbeit auch einen Beitrag zur Diskussion um die ökonomische Bewertung von Ökosystemen. Regional wird der Untersuchungsgegenstand dabei nicht eingeschränkt, da die einzelnen Untersuchungen jeweils die weltweiten Tourismusströme erfassen.

Das zweite Ziel der vorliegenden Arbeit ist die Untersuchung, ob (nachhaltiger) Tourismus und die dadurch generierten Einnahmen geeignet sind, die wirtschaftliche Entwicklung in den Zielländern zu befördern. Dies ist vor allem vor dem Hintergrund des weltweiten Strukturwandels relevant. Zur Erstellung von Tourismusdienstleistungen wird relativ viel niedrig qualifizierte Arbeit benötigt. Diese Arbeitskräfte werden allerdings im Zuge der Entwicklung hin zur wissensbasierten Industrie- und Dienstleistungsgesellschaft zunehmend weniger Beschäftigung in den diesen aufstrebenden Branchen finden. Hier könnte der Tourismussektor eine wichtige Absorptionsfunktion für vom Strukturwandel negativ betroffenen Beschäftigtengruppen erhalten. Wenn zudem im Zuge eines steigenden Welteinkommens die relative Nachfrage nach Tourismus ansteigt, könnte eine Zunahme von Tourismusdienstleistungen in den entsprechenden Ländern positive Wachstumsimpulse entfalten. Daraus folgen unmittelbar die Fragen nach den

Bedingungen für ein nachhaltiges Wachstum. Die Beantwortung dieser Fragen ist das Ziel diese Dissertation.

Die Arbeit besteht aus vier Hauptkapiteln. Grundlage dieser Kapitel sind vier jeweils einzeln veröffentlichte Forschungspapiere. In diesen wird jeweils eine Fragestellung theoretisch und empirisch, sowie unter zu Hilfenahme bisher veröffentlichter Studien, abschließend bearbeitet.

In einer ersten Analyse (Kapitel 2) werden die so genannten Pull-Faktoren oder, mit anderen Worten, die Angebotsbedingungen in den Zielländern untersucht. Ziel ist es also festzustellen, welche Faktoren es sind, die Touristen veranlassen, in ein bestimmtes Land reisen. Dazu werden auf Basis der Daten aus 212 Ländern eine Reihe empirischer Analysen durchgeführt. Dabei ist es unter anderem möglich zu zeigen, dass die Länder, die komparative Vorteile im Tourismussektor haben, jene Länder sind, die über eine reichhaltige Ausstattung mit Biodiversität (gemessen durch den Artenreichtum der Vogelpopulation) verfügen. Diese Länder weisen gleichzeitig ein niedriges Pro-Kopf-Einkommen auf, so dass Potenzial für eine wirtschaftliche Entwicklung gegeben ist. In weiteren Regressionen wird Biodiversität direkt auf die Tourismuseinnahmen der jeweiligen Zielländer getestet. Dabei zeigt sich, dass eine reichhaltige Ausstattung mit Biodiversität positiv auf die Einnahmen des Tourismussektors wirkt, während eine bedrohte Artenvielfalt die durch Touristen generierten Umsätze sinken lässt. Obwohl damit erstmals das Potential von Tourismus für wirtschaftliche Entwicklungsprozesse aufgezeigt wird, erfolgt eine umfangreiche Untersuchung dieses Wirkungsmechanismus in Kapitel 5. Ergänzend konnten weitere Faktoren gefunden werden, die die Attraktivität eines Ziellandes für ausländische Touristen determinieren. Das Pro-Kopf-Einkommen im Zielland als Indikator für den Entwicklungsstand eines Landes befördert die Tourismuseinnahmen ebenso positiv wie ein reichhaltiges kulturelles Erbe (gemessen an der Dichte der UNESCO-Weltkulturerbestätten) und ein relativ mildes Klima. Ein hoher Sicherheitsstandard (abgebildet durch die durchschnittliche Lebenserwartung im jeweiligen Land), gute Kommunikationsmöglichkeiten und das Vorhandensein wichtiger Bürgerrechte stellen ebenfalls wichtige Determinanten für Zielländer dar.

Im dritten Kapitel werden die Wirkungsfaktoren für Auslandstourismus in den Heimatländern, auch Push-Faktoren genannt, untersucht. Wie zu vermuten war, kann ein positiver und signifikanter Einfluss aller ökonomischen Faktoren, wie der des Pro-Kopf-Einkommens und der Offenheit der Märkte, auf die Tourismusausgaben pro Einwohner gefunden werden. Für die sozioökonomischen Variablen (z.B. Bildungsniveau und die Attraktivität des Heimatlandes für inländischen Tourismus) ergaben die Daten kein klares Bild. Interessanterweise konnte aber eine gemeinsame Offenheit gegenüber Tourismus festgestellt werden. So wiesen alle Länder mit hohen Pro-Kopf-Ausgaben für Auslandstourismus ihrerseits hohe Einnahmen (pro Kopf) durch Auslandstouristen auf. Weiterhin ergaben die empirischen Untersuchungen, dass Einwohner demokratischer Länder, die ein hohes Maß an Bürgerrechten und eine große politische Stabilität aufweisen, einen größeren Teil ihres verfügbaren Einkommens für Urlaub ins Ausland ausgeben. Die Hypothese, dass eine gute Ausstattung des Heimatlandes mit moderner Kommunikationstechnik ebenfalls die Reisenachfrage steigert, konnte ebenfalls bestätigt werden. Zusammenfassend für die Nachfrageseite kann gesagt werden, dass neben dem Pro-Kopf-Einkommen potentieller Touristen offensichtlich weitere sozioökonomische Faktoren eine entscheidende Rolle spielen, ob diese einen Urlaub im Ausland planen oder nicht. Letztlich kann aber die Rolle des internationalen Tourismus für Wachstumsprozesse in Entwicklungsländern entschieden bestätigt werden. So zeigen die Ergebnisse dieses Kapitels eindeutig, dass die Zahlungsbereitschaft für Auslandstourismus überproportional mit steigendem Einkommen ansteigt. Insofern macht es für Entwicklungsländer Sinn, in den Tourismussektor zu investieren, um die mit steigendem Welteinkommen zunehmenden Tourismusausgaben zu attrahieren.

Um die Nachfrage- und Angebotsseite von Tourismusströmen kombiniert zu betrachten, wird im Kapitel 4 ein Schätzmodell gewählt, das die relevanten Determinanten des Herkunfts- als auch des Ziellandes integriert. Inhaltlich wird in diesem Kapitel der Einfluss der kulturellen – speziell religiösen – Prägung auf die weltweite Tourismusnachfrage in die USA als weltgrößtem Zielland internationaler Touristen untersucht. Für die empirischen Schätzungen wird ein aus der Physik abgeleitetes Gravity-Modell verwandt Neben den Basisvariablen *Masse* (hier: jeweiliges BIP des Landes) und *Entfernung* (Distanz zwischen den jeweiligen Hauptstädten und Washington, D.C.) wurden weitere Variablen integriert, um die

exogenen Determinanten internationaler Touristenströme zu messen. Das sind zum Beispiel eine gemeinsame Sprache, die Insellage und Grenzstatus, spezielle Regelungen für VISA, relative Lebenshaltungskosten, Situation der Menschen- und Bürgerrechte. Abgesehen von den empirischen Resultaten, zeigt sich, dass die Gravity-Analyse ein sehr gutes Instrument darstellt, internationale Handelsströme zu untersuchen. Die Hauptforschungsfrage war, ob die Mehrzahl der Touristen eher ins Ausland fährt, um andere Kulturen kennen zu lernen oder ob kulturelle (und politische) Unterschiede eher abschreckend auf das Reiseverhalten wirken. Anhand der empirischen Resultate kann man die erste These verneinen, da eine große kulturelle Nähe zwischen dem Heimat- und dem Zielland einen hochgradig positiven Einfluss auf die Touristenströme zwischen diesen beiden Ländern haben. Konkret wurden diese Ergebnisse zunächst auf eine Vielzahl geografischer Variablen kontrolliert. Dennoch zeigte sich, dass Touristen aus Ländern mit einer gemeinsamen Sprache (Englisch) und demselben (hohen) Grad an Bürgerechten eher in die USA reisen als Touristen aus anderen Ländern. Vor allem konnte eine klare Evidenz für die religiöse Prägung der Touristen festgestellt werden. Reisende aus christlich geprägten Ländern (und hier besonders Protestanten und Katholiken) präferieren die USA als Reiseland wesentlich stärker als beispielsweise Muslime. Wie bereits aufgezeigt, wurden diese Ergebnisse um die Effekte unterschiedlicher Pro-Kopf-Einkommen und etwaiger Reisebeschränkungen für Bürger aus bestimmten Ländern kontrolliert. Da die in einem Land vorherrschende Religion vor allem auch ein Ausdruck einer jahrhundertealten gemeinsamen kulturellen Prägung ist, bestätigt das die These, dass Touristen bei der Wahl ihres Urlaubsziels, entgegen den üblichen Werbebotschaften, in der Mehrzahl doch eine ihnen bekannte kulturelle und politische Umgebung suchen.

Zum Abschluss dieser Dissertation wird mit Hilfe eines endogenen Wachstumsmodells aufgezeigt, ob und wie Biodiversität über den Transmissionsriemen Tourismus auf wirtschaftliches Wachstum in Entwicklungsländern wirken kann. Dazu wurde zunächst ein theoretisches handelsbasiertes Modell, abgeleitet aus einem Standard-Wachstumsmodell von Lucas (1968), entwickelt. Darin wird gezeigt, dass ein langfristiges konvergierendes Wirtschaftswachstum auch für ein Tourismusland, das annahmegemäß geringere Wachstumsraten als ein Industrieland aufweist, möglich ist. Um dieses Ergebnis darzustellen, müssen beide Länder am internationalen Güter- und Servicehandel

teilnehmen und die Nachfrage nach Tourismusdienstleistungen einer hohen Einkommenselastizität unterliegen. Dies ist empirisch der Fall (siehe Kapitel 3). Das Modell zeigt, dass eine ökonomische Wachstumsstory, gestützt auf die Tourismuswirtschaft, realisierbar ist. Diese ist dabei nicht auf einen höheren physikalischen Output (z.B. mehr Hotels), sondern auf ein inhaltlich höherwertiges Tourismusangebot angewiesen. Allerdings erfordert das die Entwicklung eines nachhaltigen Tourismus, der die vorhandene Biodiversität nutzt, aber nicht übernutzt. Die Wirkung der Biodiversitätsausstattung auf die Tourismuseinnahmen der jeweiligen Länder wird ebenfalls empirisch untersucht. Dabei zeigt sich auch hier eine positive Wirkung von Biodiversität auf die komparativen Vorteile in der Produktion von Tourismusdienstleistungen in ärmeren Ländern. Folgerichtig konnte aufgezeigt werden, dass die Tourismuseinnahmen positiv von einer intakten und negativ von einer gefährdeten Biodiversität beeinflusst werden. Wird stattdessen die Wirkung auf die bloße Anzahl der einreisenden Touristen (Indikator für nicht nachhaltigen Massentourismus) getestet, lassen sich diese Ergebnisse nicht bestätigen. Prüft man in einem zweiten Schritt empirisch die Wirkung von nachhaltigem bzw. nicht nachhaltigem Tourismus auf das zukünftige Wirtschaftswachstum, bestätigen sich empirisch die theoretischen Überlegungen, dass nur nachhaltiger Tourismus Wachstumsprozesse auslösen kann. Die Ergebnisse zeigen klar auf, dass eine Spezialisierung auf Tourismus in Ländern, die reichhaltig mit Biodiversität ausgestattet sind, wirtschaftliche Wachstumsprozesse befördern kann. Dies gilt aber nur, solange diese Biodiversität nachhaltig, das heißt nicht verbrauchend, genutzt wird.

Zusammenfassend lässt sich folgende Politikempfehlung formulieren: Obwohl Tourismus das Potential hat, eine positive wirtschaftliche Entwicklung in Länder, die sich auf diese Industrie spezialisieren, zu befördern, zeigen die (Untersuchungsergebnisse, dass sowohl in den Heimat- als auch in den Zielländern einige spezielle Bedingungen dafür erfüllt sein müssen. Da Tourismus ein superiores Gut ist, spielt erstens das Pro-Kopf-Einkommen in den Ausgangsländern eine wichtige Rolle. Nur wenn dieses dauerhaft steigt (wobei die absolute Höhe des Wirtschaftswachstums keine entscheidende Rolle spielt), ist ein entsprechender Wachstumsmechanismus für die Empfängerländer von Tourismus möglich. Zudem muss natürlich eine ausreichende kulturelle Offenheit in den Heimatländern für Tourismus vorhanden sein. Unter Bezug auf die Tourismusexportländer (Zielländer)

ist das interessanteste Ergebnis dieser Dissertation, dass Biodiversität, stellvertretend für „Schöne Natur“, neben dem kulturellen Angebot und der Gewähr von innerer Sicherheit im Zielland, ein bedeutender Angebotsfaktor ist. In Verbindung mit dem wirtschaftlichen Wachstumspotential von Tourismus zeigt dies den hohen ökonomischen Wert von Biodiversität auf. Damit dieser Wachstumsmechanismus funktionieren kann, muss allerdings eine wichtige Voraussetzung unbedingt erfüllt sein: Die Verfügungsrechte an der Biodiversität müssen zwingend privaten oder öffentlichen (Land-)Besitzern zugeteilt werden, um diesen den ökonomischen Anreiz zu geben, „ihre“ Natur ausschließlich nachhaltig zu nutzen.

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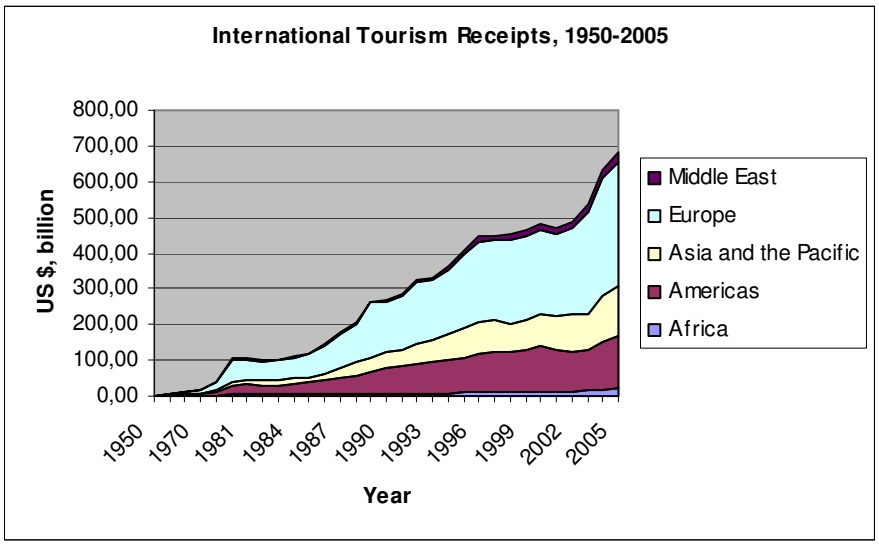
1 Introduction

1.1 Some Facts on Tourism

Tourism has become one of the most remarkable socio-economic phenomena in the last one hundred years. While in the first half of the last century tourism was an activity only for a small group of predominantly wealthy people, it has become a mass phenomenon after World-War II, particularly since the 1970s. As shown in figure 1-1, there is a steady increase in the absolute amount of tourism receipts since the year 1950, with significant decreases in the late 1970s (due to the oil crisis) and after the terrorist attack in September 2001, followed by slight declines during the Gulf War in the early 1990s and the global economic recession in the mid-1980s (see also Li at al. 2005). Considering the last years, between 1995 and 2007 tourism growth averaged more than 4 per cent per year, in spite of the stagnation between 2001 and 2003 due to terrorism, SARS and the following economic downturn. Also in real (inflation-adjusted) terms, this enormous growth trend is still present (figure 1-2). The number of international arrivals evolves from around 25 million international arrivals in 1950 to an estimated 806 million in 2005, which corresponds to an average annual growth rate of 6.5 per cent (World Tourism Organization 2009).

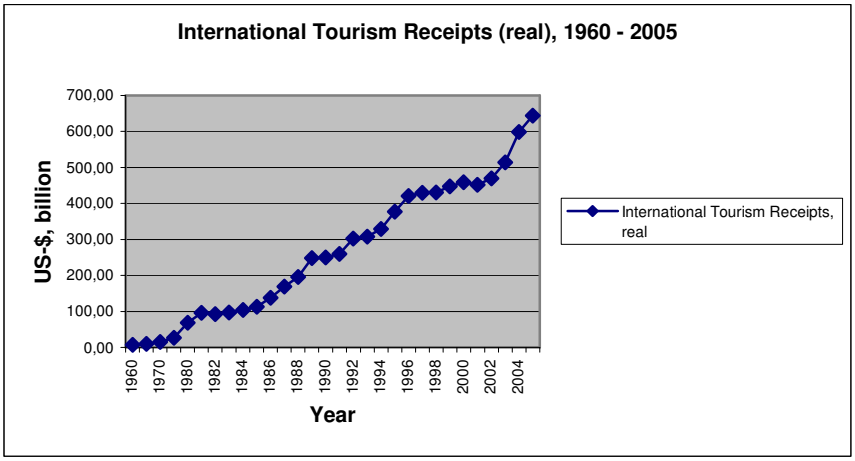
Figure 1-1: International Tourism Receipts 1950-2005



Source: World Tourism Organization (2009), Own compilation and calculations.

Although domestic tourism currently accounts for approximately 80 per cent of all tourism receipts (Neto 2003, p. 212), there is increasing interest in international tourism. Nowadays, it can be considered as a vital dimension of global integration and trade, and has (now) become the world's largest source of foreign exchange receipts (World Tourism Organization 2007b). According to the latest figures compiled by the World Tourism Organization (2008), international tourism receipts grew to US$ 856 billion (625 billion Euro) in 2007, corresponding to an increase in real terms of 5.6 per cent in 2006. Receipts from international passenger transport are estimated at US$ 165 billion, adding up the total international tourism receipts (including international passenger transport, i.e. visitor exports) to more than US$ 1 trillion, which is almost US$ 3 billion a day. This represents approximately 6 per cent of worldwide exports of goods and services. Considering service exports exclusively, the share of tourism exports on total services exports has increased to nearly 30 per cent. Hence, tourism has become an important part of international trade. Moreover, the export income generated by international tourism ranks fourth; after fuels, chemicals and automotive products. It is one of the main income sources as well as the number one export category for developing countries, which creates employment and opportunities for development (World Tourism Organization 2008, p. 3ff).

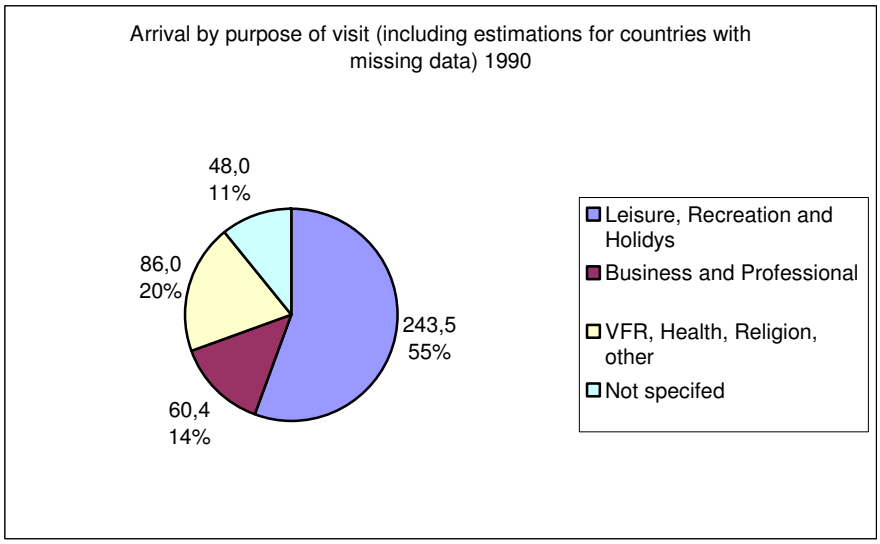
Figure 1-2: International Tourism Receipts (real) 1960-2005



Source: Own estimations. Data are from World Tourism Organization (2009).

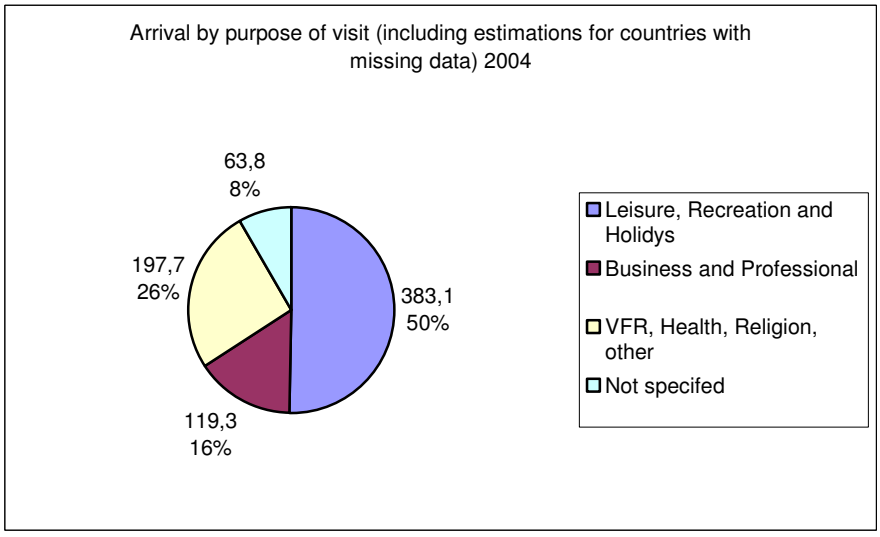
For a better understanding of the characteristics of the tourism industry it seems to be useful to highlight some stylized facts on this service sector. According to figure 1-3, in 1990 the largest share (55 per cent or 243.5 million visitors) of all tourism arrivals was related to classical leisure and holiday trips. While business travel counted for around 14 per cent (60.4 million visitors) visiting friends and relatives (VFR), health and religion travel with 20 per cent (86 million visitors) was the second largest incentive to travel. In the first instance, this is due to the enormous amount of religious trips; namely pilgrimage.

Figure 1-3: Arrivals by Purpose of Visit 1990



Source: World Tourism Organization (2005), own compilation and calculations.

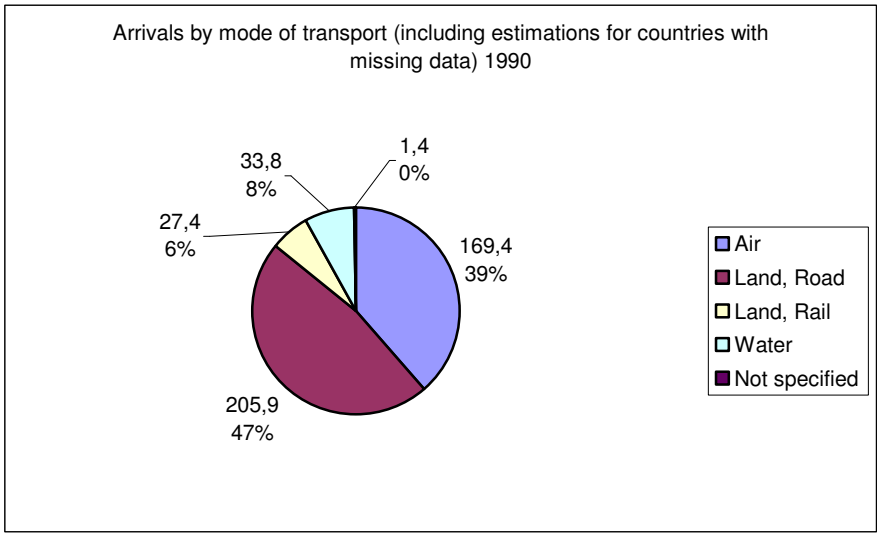
Figure 1-4: Arrivals by Purpose of Visit 2004



Source: World Tourism Organization (2005), own compilation and calculations.

Compared to 2004 (figure 1-4) it is important to notice that (except from minor modifications) the share of leisure and holiday trips (with an increased absolute number of 383.1 million visitors) has decreased by 5 percentage points to 50 per cent of tourism arrivals while the ratio of VFR, health and religion travel has increased by the same amount and counts for more than a quarter of all tourism arrivals in 2004. The main underlying driver for this development is (probably besides a greater worldwide religious orientation) the fact that there was a strong decrease of especially short range flight fares in the last 20 years. That is why the Muslim pilgrimage to Mecca (hajj) in particularly has become cheaper in the last two decades and more Muslims travel on religious purposes. Price reductions in flight fares also drive the demand for VFRs: Cheaper flights enable more people to visit there relatives worldwide. Interestingly, the ratio of business trips remains stable and presumably shows that the demand for this kind of travel has a low elasticity of prices and income.

Figure 1-5: Arrivals by Mode of Transport 1990

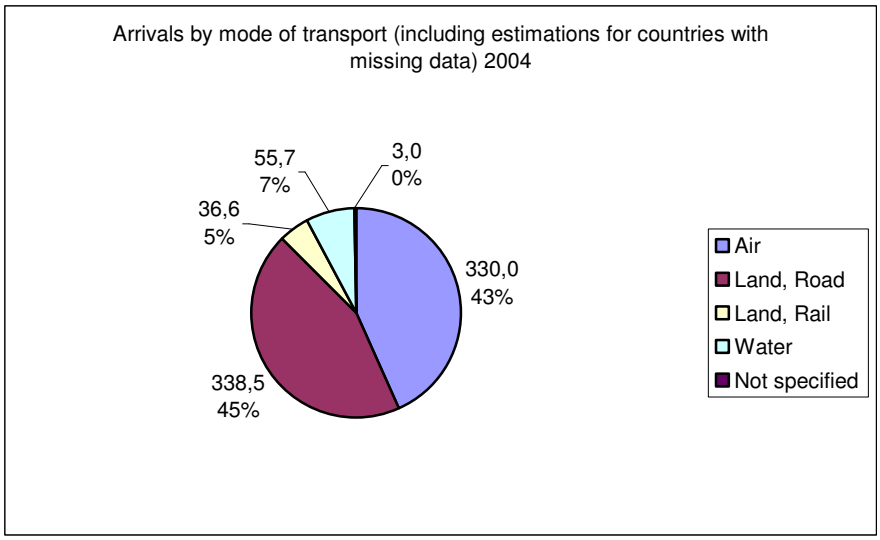


Source: World Tourism Organization (2005), own compilation and calculations.

In a next step, the tourism arrivals by mode of transport will be considered. According to figure 1-5, it does not astonish that in 1990 land transport by car counted for a share of around 47 per cent (205.9 million visitors) on total arrivals which was the primary position among the transport modes. Transport by air ranked second with 39 per cent (169.4 million) of all visits. Water and rail played rather a minor role in

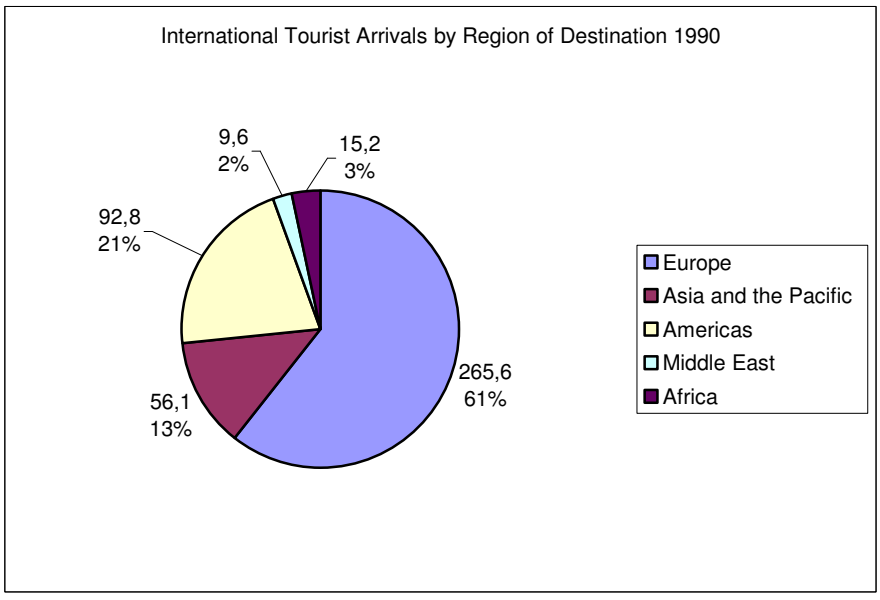
transporting tourists. By contrast, with a share of 43 per cent, air transport has risen up to the amount of road transport which counts for 45 per cent (335.5 million visitors) of total transport in 2004 (figure 1-6). Accordingly, the share of transport by water and rail has declined to 7 and 5 per cent respectively. As stated above, this development relies on the relative decline in air transport fares in the last decade. Especially for weekend trips and short breaks more and more tourists have chosen flights via so called 'low cost airlines' instead of travelling per rail or car.

Figure 1-6: Arrivals by Mode of Transport 2004



Source: World Tourism Organization (2005), own compilation and calculations.

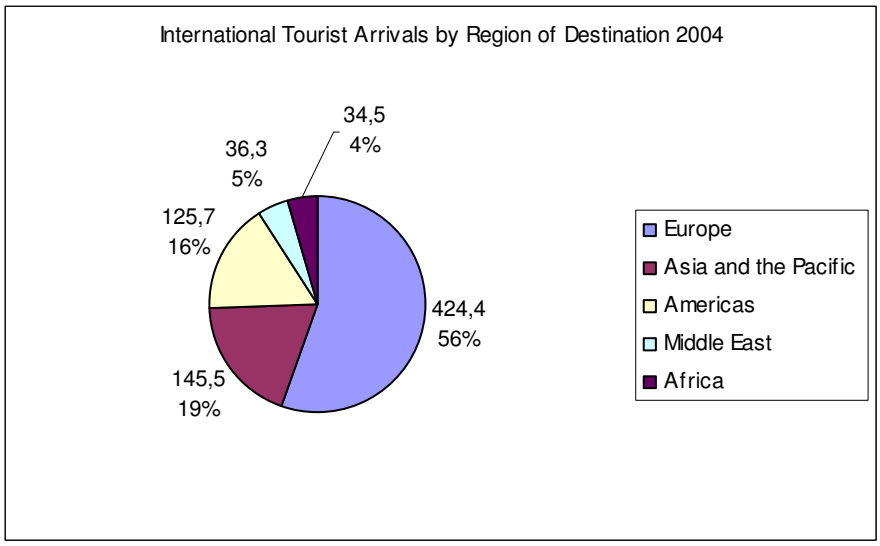
Figure 1-7: International Tourism Arrivals by Region of Destination 1990



Source: World Tourism Organization (2005), own compilation and calculations.

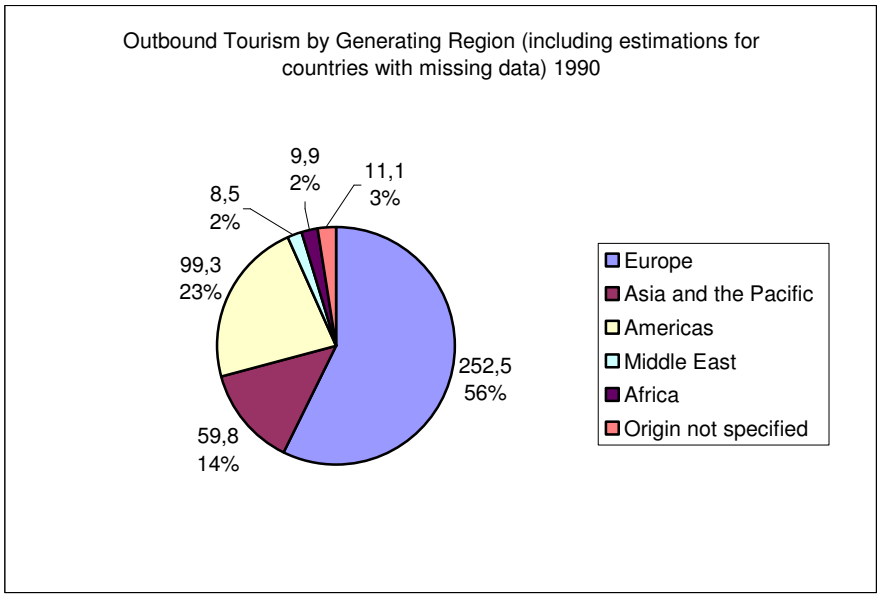
Next, the regions of tourism will be considered. As displayed by figure 1-7, Europe was the main inbound tourism destination with a share of around 61 per cent of total arrivals in 1990, followed by the Americas (21 per cent) and Asia and the Pacific region with 13 per cent of all inbound tourists. Africa (3 per cent) and the Middle East (2 per cent) were negligible. Compared with the figures in 2004 (figure 1-8) it is interesting to notice that arrivals in Europe and the Americas fell to 56 and 16 per cent respectively and Asia and the Pacific (19 per cent) ranks now second to Europe. In almost the same manner, tourism flows into Africa (4 per cent) and the Middle East (5 per cent) grew. As the main country's of origin are also in Europe (compare figure 1-9), this development suggests that long distance travel to Asia increases with increasing world income. While the top 15 destinations absorbed 98 per cent of all international tourist arrivals in 1950, in 1970 the proportion was 75 per cent, and decreased further to 57 per cent in 2007, reflecting the emergence of new destinations, many of them in developing countries (World Tourism Organization 2008). This gives us a first hint that the tourism industry in developing countries especially could benefit from increasing tourism demand. Besides cheaper flight fares, the sharp decline of prices for food and accommodation in Asian countries after the Asia crisis could be another reason for this movement.

Figure 1-8: International Tourism Arrivals by Region of Destination 2004



Source: World Tourism Organization (2005), own compilation and calculations.

Figure 1-9: Outbound Tourism by Generating Region 1990



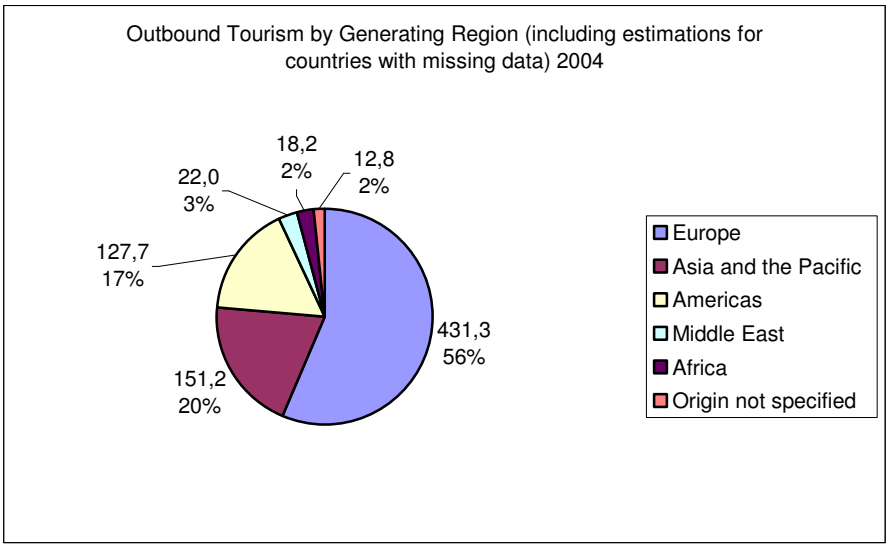
Source: World Tourism Organization (2005), own compilation and calculations.

Inversely, the outbound measures show us nearly the same picture as the inbound tourism arrivals: The Americas (23 per cent) generated the second largest outbound flows compared with Europe with a share of 56 per cent in 1990, followed by Asia (14 per cent) and Africa and the Middle East (2 per cent each) (figure 1-9).

Compared to 1999, the tourism shares of most regions remain stable in 2004 (figure 1-10). Moreover, there is a shift from the Americas to Asia (17 per cent and 20 per cent in 2004). Despite the Asia Crisis in the late 1990s, the increasing tourism demand for Asian countries as now second largest tourism generating region is not astonishing when taking the enormous economic development of especially China, India and the so called tiger states like Malaysia and Taiwan into account. As shown in figure 1-8, the continents with the highest amount of outbound tourism are recipients of the highest amounts on tourism arrivals as well. Besides the effects of cultural similarity (see Vietze 2009), the results show clearly that most tourist travel in countries nearby and potential for an increasing development of long distance travel is given.

However, Europe remains as the most relevant tourism region, both in terms of region of origin and of destination.

Figure 1-10: Outbound Tourism by Generating Region 2004



Source: World Tourism Organization (2005), own compilation and calculations.

1.2 The Literature on Tourism in General

Along with this phenomenal growth in demand for tourism in the world over the past five decades the interest in tourism research is rising. While twenty years ago there were only a handful of academic journals that published tourism-related research, there are now more than 70 journals that serve a growing research community covering more than 3000 tertiary institutions across five continents (Song and Li 2008). According to a comprehensive survey by Li et al. (2005), 420 studies on tourism were published during the period 1960–2002. The main focus of that survey is on the econometric approach. Hence, the majorities of these studies focus on both qualitative and quantitative techniques to model and forecast the demand for tourism in various destinations. The earliest tourism demand study can be traced back to the 1960s and was notably written by Guthrie (1961) followed by Gerakis (1965) and Gray (1966).

Why did research on tourism become such an important research area in the field of (service) trade? There is some evidence that especially in developing countries international tourism as superior good may well become an important factor for economic development, as demand increases by more than proportionally with world income. Additionally, international tourism may push the political leaders in the country of destination to approve more civil rights and open the country for international trade (e.g. Lim 1997b; Sinclair 1998; Deloitte & Touch et. al 1999; Brau

et. al 2003; Neto 2003; Vogt 2008; Freytag and Vietze 2009, 2010; Vietze 2009). Yet, the link between tourism receipts and economic development in the literature is not complete at all. Namely there is a research gap in modelling economic development via tourism. First steps are done by Brau et al. (2003); Lanza et al. (2003); Lanza and Pigliaru (1994, 2000) which are based on Lucas's (1988) two sector endogenous growth model. To round this work, a theoretical growth model is developed in section 5 of this thesis (see also Freytag and Vietze 2010). As previous empirical studies regarding this effect are only done on a limited sample scale (e.g. Brau et al. 2003; Eugenio-Martin et al. 2004; Arezki et al. 2009), more empirical evidence for the growth-enhancing effect of sustainable tourism, basing on a broad sample of 130 countries, is also presented in this chapter.

As tourism is considered to be a relevant factor for development, another important question to answer is which determinants can push the demand for tourism in the countries of origin as well as destination In this thesis, we try to investigate the determinants which explain the huge differences in the tourism flows of international travel between countries.

Modeling tourism demand in order to empirically analyze the effects of various determinants as well as accurate forecasting of future tourism demand were two major focuses of tourism demand studies in the past four decades (Song and Li 2008). Since then, a large number of empirical studies on tourism demand have been published in a number of reviews; Crouch (1994a, 1994b, 1994c, 1994d, 1995, 1996) examined about 80 econometric studies of international tourism demand covering the period 1961-1993[1]. He identified via meta-analysis' also a range of differences between these studies that explain the variations in the findings principally with respect to demand elasticities (Crouch 1994a, 1994b, 1995, and 1996). By reviewing 100 papers published during the period 1961-1994, Lim (1997a, 1997b) discusses the choice of dependent and explanatory variables as well as the functional specifications and data used for the empirical analysis of tourism demand. Further on, Lim (1999) calculates the fixed (respective random) effect sizes in a meta-analysis of selected 70 studies, attempted to generalize the interdependency between international tourism demand and income, transportation cost, and other

[1] In his extensive literature research Crouch (1994c) find more than 300 publications during this period.

tourism related prices. There are other tourism surveys, but most of them are less valuable with respect to included papers (Li et al. 2005).[2] In the latest review, Song and Li (2008) only concentrate on the most recent 121 publications since 2000 (these include 119 articles published between 2000 and 2006 and 2 emerging in 2007). According to this survey, the latest developments of quantitative forecasting techniques can be summarized in three categories: simple time-series models, the econometric approach (cross-county and panel techniques), and other emerging methods such as artificial intelligence techniques. Although recent studies show that the newer and more advanced empirical techniques tend to result in improved explanation power under certain circumstances, no clear-cut evidence shows that any model can consistently outperform other models in the accuracy of explanation and forecasting competition (Song and Li 2008, pp. 217). Nevertheless, the authors conclude that one of the major advantages of the econometric cross country approaches over simple time-series models lie in their ability to analyze the causal relationships between the tourism demand (dependent) variable and its impact factors (explanatory variables). Econometric cross country/region analyses are empirically useful for the interpretation of the change in tourism demand from an economist's (and not sociological case study) perspective, providing policy recommendations in a general manner as well as evaluating the effectiveness of the existing tourism policies.

Panel data analyses, which are sometimes constructed as gravity models, have some advantages over the time series econometric models, as they incorporate much richer information from both time-series and cross-sectional data. This approach also provides more degrees of freedom in the model estimation and reduces the problem of multicollinearity. In spite of its advantages, the panel data approach has currently uncommonly been applied to tourism demand analysis. Song and Li (2008) found only four panel data studies in the post-2000 literature: Ledesma-Rodríguez et al. (2001) use the panel data method to model the demand for Tenerife tourism. Additionally, Naudé and Saayman (2005) and Roget and Gonzalez (2006) both use panel data to examine demand for tourism in 43 African

[2] Sheldon and Var (1985) consider only 11 studies in their review, all but one of them published before 1978. Uysal and Crompton (1985) provide an overview of various forecasting tourism studies, but with no insight into individual studies. Forty empirical studies published throughout three decades have been reviewed by Witt and Witt (1995), but all prior to 1992.

countries and the demand for rural tourism in Galicia, Spain, respectively. Likewise, Sakai et al. (2000) analyze the effects of demographic change on Japanese people's travel propensity by using this approach.

As far as the impact factors are concerned, recent econometric studies of tourism demand have shown that 'hard' economic factors (e.g. tourists' income, tourism prices in a destination country relative to those in the country of origin, tourism prices in competing destinations (i.e., substitution effects due to price and exchange rate differences)) are the most important determinants of tourism demand. By examining the above mentioned reviews on tourism demand modeling, it is important to notice that nearly all of the authors concentrate on economic factors by explaining tourism demand. There seems to be a research gap concerning the impact of geographical and socio-cultural determinants – especially in the countries of origin – on tourism demand. Since research on tourism demand modeling relies on secondary data, the availability of the data determines the coverage of the examined geographical areas to a large extent. In the past, the USA and Western Europe, as traditional international tourism markets, were the most popular researched countries, from both the perspective of destination and origin country and still attract considerable attention in recent empirical research. Overall, most of the studies rather concentrate on a minor group of countries or regions then on comparisons at a worldwide scale including more than 200 countries (see Lim 1997b; Zhang and Jensen 2007; Song and Li 2008).[3]

1.3 Structure of the Thesis

Like in several sectors of consumer demand, attitudes, believes and the political environment may also influence the worldwide demand for tourism. Therefore, among others, this thesis concentrates on geographical and socio-cultural factors of tourism demand in both the country of origin and destination on a worldwide scale.

Hence, the aim of the thesis is to find the relevant determinants of tourism demand, economical, geographical and socio-cultural factors as well. In a second step we

[3] These findings are consistent with previous reviews such as Li et al. (2005) and Lim (1999).

analyze whether and how (sustainable) tourism can be a trigger for economic development.

Concretely, in this thesis: (i) We will firstly investigate the pull factors of tourism demand in the country of origin. Besides other (economic) factors we review the impact of geographical variables on the tourism receipts in a respective country. The impact of biodiversity as a proxy for "nice nature" on tourism receipts will be analyzed in particular. (ii) In a second step, we take a look on the other side of the medal – the push-factors of tourism. In other words, to get more insights into the social behavior of tourists the determinants of outgoing tourism in the countries of origin, measured via tourism expenditures per capita (respectively per GDP) will be econometrically investigated. (iii) To combine both the impact factors in the country of origin and the country of destination empirically, in a third section we run a gravity model with a panel dataset, including the most expected economical, geographical and cultural determinants of tourism (arrivals). In our analysis we concentrate on one country of destination (and 208 countries of origin), the USA, which cover nearly all types of tourism, because of its geographical dimension, natural and cultural richness and good infrastructure. Additional, the USA is the world's top tourism destination country measured by absolute tourism receipts (number three in the world considering absolute number of tourism arrivals, see World Tourism Organization 2006). Furthermore, the USA as destination country provides the most comprehensive country to country tourism flow data. (iv) In the fourth and last main part of the thesis, the potential for sustainable economic development via tourism will be reviewed. To deal with this issue, we will present a tourism specific theoretical growth model and investigate the policy requirements for sustainable growth empirically by distinguishing between the demand factors of sustainable and unsustainable (mass-) tourism respectively.

The above mentioned topics are covered in the following four articles:

'Biodiversity and International Tourism: A Story of Comparative Advantage' (2009), co-authored by Andreas Freytag and published in *The Open Political Science Journal* 2, pp. 23-34.

'What's Pushing International Tourism Expenditures?' (2009), published in *Jena Economic Research Paper*, 14/2009, pp. 1-24, forthcoming in *Tourism Economics* 2011.

'Cultural Effects on Inbound Tourism into the USA: A Gravity Approach' (2008), published in *Jena Economic Research Paper*, 37/2008, pp. 1-33.

'Can Nature Promote Development? The Role of Sustainable Tourism for Economic Growth' (2010), co-authored by Andreas Freytag and published in *Jena Economic Research Paper*, 08/2010, pp. 1-32.

In the first paper "*Biodiversity and International Tourism: A Story of Comparative Advantage*", it is analyzed whether biodiversity is increasing the receipts of tourism and thus is beneficial for developing countries (DCs). By using the standard Heckscher-Ohlin trade theory framework, the underlying assumption is that a rich biodiversity (whereby which the most DCs are well endowed) provides a comparative advantage in exporting tourism services. The model is supported by an empirical analysis. The main findings are that first, DCs being abundant in biodiversity seem to have a comparative advantage in (sustainable) tourism, that second, incidence of birds as the probably best explored taxonomic group has a positive impact on inbound tourism receipts per capita, and that third, the rate of endangered to total birds is negatively influencing tourism receipts. Additionally, important pull factors of tourism demand like the cultural richness and the per capita income (as a proxy for level of development) in the country of destination are considered. Earlier versions of this article have been published as Freytag and Vietze (2006, 2007) and were presented at the Public Choice Society Meeting 2006 held in March 2006 in New Orleans, Louisiana, USA. The current version is published as Freytag and Vietze (2009) in *The Open Political Science Journal*.

In the second paper "*What's Pushing International Tourism Expenditures?*" the socio-economic determinants which contribute to outbound tourism expenditures in countries of origin are discussed. A strict robust positive impact of all economic factors like the per capita income and the openness to trade on tourism expenditures per capita as well as on tourism expenditure per GDP are found. There seems to be somewhat like a mutual openness to tourism as countries which are able to attract high inbound tourism receipts per capita also having high outbound tourism expenditures per capita as well. A further important finding is that people in

democratic countries spend a higher share of income for traveling abroad. The results give an encouraging hint that it makes sense for developing countries to invest in the tourism sector as an increasing willingness to pay for outbound tourism goes hand in hand with an increasing per capita income in the world. This paper has been published as Vietze (2009) and is forthcoming in *Tourism Economics* (Vietze 2011).

In the third paper *"Cultural Effects on Inbound Tourism into the USA: A Gravity Approach"* the effects of cultural – and particular religious – factors on tourist flows into the USA as the world largest tourism destination are discussed. To estimate this question empirically an augmented gravity equation is run. The results give evidence that cultural proximity between the country of origin and the country of destination has a positive effect on the tourism flows between these countries. In particular, after controlling for a set of geographic variables, it is shown that people from countries with the same language (English) and the same (high) governmental ranking like the USA, travel more into the USA for holiday than those from other countries. Overall, it is clear and stable (controlled) evidenced that tourists from Christian countries prefer the USA as a holiday destination much stronger than people from countries with a different religious imprint. This supports the argument that people wishing to go on holiday to countries with a similar cultural and political background. This article is published as Vietze (2008) and was presented at the UNWTO International Conference of Tourism: "Knowledge as value advantage of tourism destination" held October 2008 in Malaga, Spain.

In the fourth paper *"Can Nature Promote Development? The Role of Sustainable Tourism for Economic Development"* it is analyzed whether biodiversity is enhancing the development process in developing countries (DCs) via increasing tourism receipts in a trade based endogenous growth framework. The underlying assumption is that a rich biodiversity – only if used sustainably – provides a comparative advantage in tourism for most DCs. The main empirical findings are that biodiversity while being significantly and positively correlated with inbound tourism receipts in DCs, has no significant relation with tourist arrivals. This can be interpreted as an indicator that mass tourism is not influenced by biodiversity whereas individual tourism (as a superior good) is. Consequently, it is possible to show empirically a positive influence of sustainable tourism on economic growth. Therefore, it may be a

promising development strategy to invest in biodiversity and attract high budget tourists. This article is published as Freytag and Vietze (2010).

After the presentation of the above mentioned papers – in the actual submitted format of the respective journal – in the next four chapters; in the fifth section we derive some concluding remarks. Further on, a short outlook on future research questions addressed to the topic of this thesis is given.

2 Biodiversity and International Tourism: A Story of Comparative Advantage

2.1 Introduction

In this chapter we discuss tourism as good of international service trade. In particular, the determinates of tourism supply are in the focus of our analysis; to wit we explain differences in tourism flows with the pull factors in the countries of destination. Why did we do this?

As international tourism receipts represents approximately 6 per cent of worldwide exports of goods and services (World Tourism Organization 2006), international tourism may well become an important factor for economic development which depends on a "terms of trade effect" as long as demand increases by a higher rate than world income (see chapter 5). In other words, tourism is beneficial for growth if the international terms of trade move in favour of tourism services. This is the case if tourism is a superior or luxury good, such that consumers' demand increases strongly with rising income (income elasticity of demand higher than one) (Lim 1997b; Brau et al. 2003, p. 16; Divisekera 2003; Eilat and Einav 2004, p. 1325). In particular, it stimulates new economic activity because tourists demand a number of goods and services: e.g. food, accommodation, transportation, entertainment and local handcrafts as souvenirs. Because the tourism sector is labor intensive, an increase in employment can be expected (Nijkamp 1998; Sinclair 1998; Deloitte & Touch et al. 1999; Neto 2003, p. 4ff). Another indirect effect is that international tourism may push the political leaders in the country of destination to establish good governance, grant more civil rights or open the country for international trade. These assumed effects are particularly relevant for developing countries (DCs), which often have high rates of unemployment, "problematic" governments and difficulties in entering international trade. Recent studies investigate empirically the effects of tourism on economic growth. For instance, Brau et al. (2003) analyze if specializing in tourism is an appropriate growth strategy for least developed countries (LDCs). They assess the relative growth performance of 14 "tourism countries" within a sample of 143 countries, observed during the period 1980-95. Using standard OLS

cross-country growth regressions, they show that the tourism countries grow significantly faster than all the other sub-groups considered in their analysis (OECD, Oil, LDC, small countries). Moreover, the authors find that other growth factors – low base value of per capita GDP, high saving/investment propensities or high openness to trade – do not significantly contribute to the positive performance of the tourism countries. Hence, they find that tourism specialization is an independent determinant for economic growth (Brau et al. 2003, p. 11-17). Another empirical study supports and confirms this result. Eugenio-Martin et al. (2004) examine the relationship between tourism and economic growth with an analysis based on a panel data approach focusing on Latin American countries between 1985 and 1998. They estimate the relationship between economic growth and an increase in the number of tourist arrivals per capita conditional on main macroeconomic variables. The findings show that the tourism sector is a driver of economic growth in medium or low-income countries, though not necessarily in developed countries (Eugenio-Martin et al. 2004, p. 5-11). This is particularly relevant in the light of climate change. It will certainly not be desirable that all developing countries take the same development path like the old western economies, as this development was linked with rapidly rising environmental damages in the past. So a leapfrogging economic development via tourism may be an answer to this trade-off. We will further discuss this in chapter 5.

Because of these assumed positive effects tourism may have on economic development, a first question to answer is which determinants can promote the demand for tourism. There are many explaining factors for international tourism arrivals such as nature, price level, safety[4], infrastructure and educational level.[5] Entertainment and sightseeing in a certain region or country also play a prominent role in the decision making process of tourists for a destination (Lim 1997b). Proxies for sightseeing and entertainment activities may be the number of beaches, bars, sport facilities, museums, memorial sites, the quantity and quality of accommodation

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[4] Eilat and Einav (2004) show in three-dimensional panel data analysis on the determinants of international tourism that the political risk is quite important for the choice of destination, while the price level only matters for tourism to developed countries.

[5] Eugenio-Martin et al. (2004) try to explain tourist arrivals conditional on GDP and other control variables such as safety, prices and educational level as well as investment in infrastructure empirically. Their results provide evidence that low-income countries seem to need adequate levels of infrastructure, education and development to attract tourists, while medium-income countries need high levels of social development like health services and relatively high GDP per capita levels. Finally, the results show that the price level of the destination, in terms of exchange rate and PPP is irrelevant for tourism growth.

facilities and the like. In addition, geographical aspects such as the number of directly neighboring countries or the distance to rich countries may play a role.

The focus of our examination is laid upon the factor nature, in particular on the question of whether and to what extent biodiversity[6], as a directly influencing factor for sightseeing activities (safaris etc.) and an indirectly influencing factor for "nice nature", determines the demand for tourism, as it is assumed in a number of theoretical papers (e.g. Nijkamp 1998; Muir-Leresche and Nelson 2000; Ashley and Elliott 2003; Creaco and Querini 2003; Valente 2005). Zhang and Jensen (2005) confirm in a panel data analysis dealing with the supply-side of tourism flows that country fixed effects are highly relevant for the destination choice. They conclude – albeit without a proof – that this result depends on the natural endowment and cultural heritages of the respective country. Naidoo and Adamowicz (2005) evaluate tourists' and foreign residents' demand for elevated biodiversity levels (increased numbers of bird species to be watched) conducting a choice experiment in Uganda. They wanted to determine how preferences for particular protected areas are formed relative to other protected areas attributes. Their analysis provides evidence that biodiversity *per se*, i.e. the number of different species in a given situation, contributes to nature based tourism by enhancing the attractiveness of a protected area to tourists. This is a very relevant outcome not only for ecological purposes but also for economic development, as it further supports the view that the alleged trade-off between the economy and the environment is not a necessary phenomenon of development. Because it may be assumed that developing countries are relatively rich in biodiversity, it can be an important precondition for a growing tourism industry, which then contributes to sustainable development in these countries. A rich biodiversity may provide a comparative advantage for tourism in the developing world.

Economic growth, trade and especially tourism (e.g. Nijkamp 1998; Berno and Bricker 2001; Neto 2003) may also have a negative impact on biodiversity. As trade and tourism – in particular through the introduction of damaging invasive exotic species – can affect the local biodiversity negatively, there may be rebound effects

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[6] Biodiversity is differentiated in the standard literature into ecological, organism and genetic diversity (Heywood 1995). Although our variable introduced below ($BIRDS$) relates to organism diversity, we have in mind a more general concept of biodiversity covering the three subcategories.

for a nature based tourism industry (e.g. McAusland and Costello 2004; Polasky et al. 2004).[7] Thus, if it can be shown that biodiversity is beneficial for tourism and economic development, it is sensible to invest into biodiversity or create incentives to protect biodiversity.

This chapter builds upon this literature and concentrates on the determinants of tourism in an empirical analysis. To deal with this problem, we first present theoretical considerations and derive three hypotheses about the relation between biodiversity (measured as the number of bird species in a country) and international tourism. In section 2.3, we empirically assess the hypotheses in cross-country regressions. Finally, we draw cautious policy conclusion with respect to biodiversity conservation and development (section 2.4).

2.2 Theoretical Foundations

As the aim is to explain the determinants of international tourism, the analysis is based upon a standard Heckscher-Ohlin framework in international trade. Consider a world formed of two small countries; country B (well endowed with biodiversity) and country C (relatively rich of capital). Each country is characterized by a two sector economy which produces manufactures and tourism with two factors of production: capital (C) and biodiversity (BD). Trade then is based on differences in factor endowment.

The assumption of biodiversity being a factor instead of a result of production is not standard (see e.g. Brander and Taylor 1997, 1998; Hannesson 2000; Polasky et al. 2004; Smulders et al. 2004). These authors treat nature as a product. However, for the problem discussed in this paper, it is highly plausible to treat biodiversity as a factor rather than as a product: tourists are only rarely interested in the number of species. In general, they consume services such as recreation, sightseeing and education. Nature is an input to provide these services. Moreover, assuming that the

[7] For general empirical assessments of the relation between biodiversity and economic welfare see Naidoo and Adomowicz (2001); Asufu-Adjaye (2003); Barbier and Bulte (2004); Lomborg (2004) as well as Freytag et al. (2009).

property rights are assigned correctly, biodiversity can be analytically treated like any given factor of production. If property rights exist, the factor has a positive price.

The factor prices are determined differently for both factors. The capital market is decisive for the interest rate as the price for capital. This is standard. The price for the factor biodiversity is the marginal cost of preserving nature. This assumption has important implications for the long-run use of this factor, in particular as a market for biodiversity does not exist without political support. Without a positive price, there is the danger of an overuse, as biodiversity then can be treated as a common pool property that is used by anyone but owned and preserved by no one. Thus, the assignment of property rights plays a major role for the factor price and factor use. In our case it is important that someone claims biodiversity as private property.

The two goods are produced with different factor intensities. Manufactures are produced relatively capital intensively, while the production of tourism requires relatively more biodiversity. In autarky, both countries produce both goods and reach a social optimum under different relations of the prices of factors and goods. Next, we assume that these countries engage in international trade.[8] In a Heckscher-Ohlin world, international trade will lead the individuals in the two countries to specialize according to their comparative advantage. Thus, country B focuses on the production of tourism, while country C produces relatively more manufactures.[9] The trade implications of this model are the following: country B exports tourism services via mode 2 (consumption of foreign services abroad) of GATS (General Agreement on Trade in Services). In exchange for the consumption of tourism, the citizens of country C export manufactures. We will use this result in hypothesis 1, claiming that countries with biodiversity abundance have a comparative advantage in tourism.

After discussing the concept of comparative advantage, we now focus on absolute tourism flows. Both the second and third hypotheses deal with absolute tourism receipts and therefore critically depend on the problem of factor prices. First consider that the property rights of capital (and biodiversity) are correctly defined in country C, but the property rights for biodiversity in country B are not exactly assigned. In that

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8 To simplify we do not consider trade-induced habitat effects (see Smulders et al. 2004).

9 We do not solve a formal model, as an equilibrium resulting in new world market prices for the traded goods with factor price equalisation is not in our focus.

case biodiversity is a common property and it is impossible to exclude consumers from consumption of biodiversity, but these consumers compete for the consumption. Hence, it is rational for the individual consumer to overuse biodiversity. If property rights on biodiversity are not assigned correctly to private or public (land-) owners, its factor price is zero as the formation of prices for the good biodiversity is impossible if there is nobody who owns and therefore can sell or buy this good. Country B thus faces the typical problem of a common property and nature will be overused. Yet, if a species is completely extinct it can not be recovered (Asufu-Adjaye 2003, p. 182). The supply of tourism increases, the price for this service is lower than needed to regenerate the factor and nature will be overused. It takes time to regenerate biodiversity. In the long run, this effect leads to a decrease in international tourism receipts as the input factor degenerates. As factor prices tend to not be equalized in this situation country B may even experience a loss from trade (Brander and Taylor 1998; Smulders et al. 2004). We use this result in hypothesis 2 in a general manner by claiming that an overuse of biodiversity reduces absolute tourism exports of country B.

By contrast, the third hypothesis is based on a long-term political calculus in country B. This approach leads to a correct assignment of property rights not only for capital, but also for biodiversity; positive factor prices exist in both countries for both factors. The holders of biodiversity have an incentive to reproduce their resource and to prevent an overuse of it. Therefore, trade is taking place according to comparative advantage. Hypothesis 3 claims that the absolute international tourism receipts are positively influenced by the degree of biodiversity in a country.

2.3 Determinants of Tourism: Cross-Country Empirical Evidence

This section of the paper is dedicated to an assessment of the three hypotheses of our theoretical considerations in a cross-country analysis[10]. **First**, we claim that countries with abundant biodiversity endowment are likely to export tourism services; they attract high tourism receipts because they have a comparative advantage in tourism services. There should be a positive correlation between the degree of

[10] For countries used in the analysis see Appendix 1-A.

biodiversity and a measure reflecting comparative advantage, namely the revealed comparative advantage (RCA) for the tourism industry T in country i in the year 2003. The RCA-index is calculated as follows: $RCA(1)_{Ti} = \ln \frac{X_{Ti} / M_{Ti}}{\sum X_i / \sum M_i}$, were X_T are the inbound tourism receipts, M_T are the outbound tourism expenditure, both reported by World Tourism Organization (2007b). The variables X and M are the total amount of goods and services exported and respectively imported by country i (WTO 2006).[11] This hypothesis will be assessed by estimating the influence of proxies for biodiversity and some control variables on the RCA in a cross country analysis using a simple OLS model.[12]

The **second hypothesis** reflects the short-term perspective of a biodiversity abundant country. Assuming that a permanent biodiversity loss diminishes the export in tourism of the very country at least in the long run, we assess how a proxy for potential biodiversity loss and therefore for a wrong or incomplete assignment of the property rights of biodiversity influences the inbound tourism receipts per capita. The literature review of econometric tourism demand models show that there is not a standard measure of tourism flows (see also Vietze 2009). The majority of the studies in this area define international tourism demand by using one of the following measures: the number of foreign visitors crossing the border (tourism arrivals), or the tourism receipts (respective tourism expenditures)[13] (Proença and Soukiazis 2005). As the paper concentrates on the determinants of inbound tourism the dependent variable in this study is – like in many tourism analyses (Song and Li 2008)[14] – the

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[11] Another measure reflecting revealed comparative advantages for the tourism industry T in country i is calculated as follows: $RCA(2)_{Ti} = \ln \left[X_{Ti} / \sum X_{Ti} \Big/ X_i / \sum X_i \right]$, were X_{T_i} are the inbound tourism receipts in 2003, reported by World Tourism Organization (2007b). The variables X_i is the total amount of goods and services exports by country i (in 2003), reported by WTO (2006). By calculating also this RCA-index we estimate the same model below. The results are similar, and holds stable throughout the four regressions. This is not astonishing as both RCA-Indices are highly correlated ($corr(RCA(1)_{Ti}; RCA(2)_{Ti}) = 0.8747$).

[12] It has to be noted that RCA scores may be distorted by trade policy measures. Given that we do not have better indicators, we have to accept this problem and be cautious when deriving policy conclusions.

[13] The number of nights spent by visitors from abroad and the length of stay of visiting tourists is also used.

[14] Crouch (1994d) indicates that of the 85 tourism studies reviewed, 48 per cent chose tourists arrivals as the measure of demand. To control the size effect we use tourism receipts as per capita measure.

flows of inbound tourism receipts per capita for 2003 (TR) as reported by the World Tourism Organization (2007b) for 208 countries. In tourism studies '*the dependent variable is an aggregate of several separate activities definable in money terms and not a quantity as in the conventional way of estimating such coefficients*' (Kanellakis 1975, p. 17). Yet, the matter of an appropriate demand measure is further compounded by the fact that tourism demand in monetary terms represents both an amount of expenditure and the quality of consumption and is, therefore, not unproblematic (Smeral 1988; Crouch 1994d). As tourism arrivals do not control for either the length or the spending intensity (actual value consumed) of the tourist stay at the individual destination, measuring demand in real monetary terms is preferable (Anastasopoulos 1984; O'Hagan and Harrison 1984). Hence, flows of tourism receipts (respectively expenditures) are superior to flows of tourism arrivals (Zhang and Jensen 2007; Vietze 2008). The proxy for a substantial biodiversity loss is the ratio of endangered bird species to bird species in a country (see below). For this estimation, we expect a negative sign. The necessary data is available for more than 160 countries. The controls are the same as in hypothesis 1.

The **third hypothesis** of the theoretical section is that sustainable tourism is a superior good and can "in the long run" create substantial export receipts in tourism, if the regeneration of the natural resource BD is taken seriously and the property rights of biodiversity are assigned completely. We assess whether inbound tourism receipts per capita are determined by the same exogenous variables as above, with the exception that we use the number of bird species per square kilometer in a country as a proxy for the absolute biodiversity endowment (per size) instead of one for endangered biodiversity in relation to all biodiversity as above. We expect a positive influence of biodiversity endowment on inbound tourism receipts. Furthermore, we use a proxy for property rights of biodiversity as well as a number of control variables to asses their influence on inbound tourism receipts. Beside those used in hypotheses 1 and 2 these mainly consist of institutional variables (see below).

The most important exogenous variables (variable $BIRDS$ and $ENBIRDS$) as proxies for biodiversity and its loss respectively are measured by the number of bird species living in the country for the year 2003, as documented by BirdLife International (2005). Birds are suitable indicators for biodiversity for several reasons (Riecken

1992; DO-G 1995; Boening-Gaese and Bauer 1996; Plachter et al. 2002; Gregory et al. 2003; BirdLife International 2004; Naidoo and Andamowicz 2005), especially for studies on a global scale (Bibby et al. 1992; Burgess et al. 2002):

- Individual birds usually have large home ranges in complex habitats that require specific structures for several parts of the life-cycle (e.g. nesting sites, hibernation sites). Thus, they respond often very sensitively to changes in their habitat (e.g. due to economic efforts or due to nature protection efforts).
- Many species are carnivorous, representing high positions in the food chain. Thus, they also need a complexly structured habitat, fulfilling the requirements for a high prey density. Consequently, many bird species are considered as "flagship species" (Lawton et al. 1998) whose presence indicates the presence of a species-rich animal and plant community.
- Birds may represent the best-known animal taxon, and an avifauna is usually available not only for countries, but also for other geographical or political units.
- The number of bird species can not be politically instrumentalized (Metrick and Weitzman 1998; Rawls and Laband 2004), as long as the counting is done independently.

An alternative to the use of number of species for monitoring changes in biodiversity is a biodiversity index relying on individual countries' richness as favored by Magurran (2004) and by Bruckland et al. (2005). The theoretical rigor of their argument is convincing, but our indicator ($BIRDS$) is the only indicator which is available worldwide on country scale. The variable $BIRDS$ is expressed as number of bird species in relation to the size of the country in square kilometers (km^2) as it is done by Asufu-Adjaye (2003). In addition to $BIRDS$, we calculate the ratio of endangered bird species to all bird species in a country (variable $ENBIRDS$). To use $ENBIRDS$ is sensible. It indicates the incentives in a country to preserve nature and represents the common pool property.[15] The list of endangered birds is applied world-wide. Therefore, even if some distortions are in the list, this holds for all

[15] One may argue that the government in a country with a high number of endangered species is aware of the problem and has avoided extinction so far. Following this argument, the opposite interpretation seems to be justified: countries are concerned about endangered species; otherwise the list would be shorter. For us, this is a very apologetic interpretation. We argue that endangered birds are endangered because governments do not take them into account and not the other way round.

countries similarly. These two variables are statistically not interdependent (see table 2-2). Other exogenous control variables are the following:

- real GDP per capita in current US-$ for the year 2000 ($GDP2000$) and 2003 ($GDP2003$), source is Heston et al. (2006) and IMF (2006),
- the length of the coast line (in km) in relation to the size of the country in square km ($COAST$) as a proxy for beaches, source is CIA (2005),
- the number of UNESCO World Heritage sites in relation to the size of the country in square km (WHS). This variable is used as control for the influence of important historical and cultural sites on tourism. Source is the German Commission for UNESCO (2005),
- the distance of the country (approximate geographic center) to the equator in grad (longitude) (EQ) as a proxy for differences in climate, source is CIA (2005),
- the size of the country ($SIZE$), source is CIA (2005),
- the population of the country (POP), source is Heston et al. (2006),
- the number of national borders ($BORD$), source is CIA (2005),
- life expectancy (LE) as a proxy for the safety and the quality of the health system of a destination, source is CIA (2005),
- the World Bank governance indicators in 2002 for control of corruption ($CCORR$), political stability ($POLST$), rule of law (LAW) and voice and accountability ($VOICE$); all of these also as proxy for the safety of a destination, source is Kaufmann et al. (2006).
- the ratio of IUCN category I-IV protected areas per total land area of the country ($IUCN$) as an additional proxy for assigned property rights of biodiversity to public land owners, source is WRI (2006),
- finally the number of internet accesses per thousand inhabitants (NET) as a proxy for communication possibilities, source is World Bank (2007).

The descriptive statistics referring to revealed comparative advantage of tourism exports (RCA), inbound tourism receipts per capita (TR), bird species in relation to the size of the country ($BIRDS$), the ratio of endangered bird species to all bird species ($ENBIRDS$) and the number of UNESCO world heritage sites in relation to the size of the country (WHS) are reported in table 2-1.

Table 2-1: Descriptive Statistics Chapter 2

	MIN	MAX	Mean	Median	Std-dev.	N
RCA	-3.660	3.2079	0.5879	0.5671	1.1054	126
TR	0.0177	12,352	815.65	121.81	2,089.3	167
BIRDS	3.69E-05	1.1969	0.0662	0.0038	0.1823	202
ENBIRDS	0.0000	0.4943	0.0709	0.0516	0.0701	203
WHS	0.000	0.0394	0.0004	5.74E-06	0.0030	191

Source: Own estimations.

Because it is apparent that the sample does not have disturbances with identical variance, we generally run a White-Heteroskedasticity residual test and use an adjusted OLS-estimator robust to heteroskedasticity in these estimations. We also test for reverse causality between the dependent variable and explanatory variables, running a Granger causality test between $BIRDS$ and tourism receipts per capita (TR). According to this test, we cannot reject the hypothesis that TR does not Granger cause $BIRDS$ but we can reject the hypothesis that $BIRDS$ does not Granger cause TR. Therefore, it appears that Granger causality runs one-way from $BIRDS$ to TR and not the opposite way. Another problem may be multicollinearity, in particular high correlation between the World Bank governance indicators as control variables. To avoid this problem, we do not use all indicators simultaneously. Including a set of dummies and time invariant variables (above all the variables $BIRDS$ and $ENBIRDS$ which are counted in a four year frequency (Birdlife International 2008) in our estimation model, a country fixed effects panel estimation cannot be applied. A panel model is also not possible, regarding low time series data availability (WHS, $BIRDS$). As it is our intent to explain the heterogeneity in tourism demand within the world with exogenous socio-geographic variables, we cannot apply the '*fixed-effects modeling [as] a result of ignorance*' (Cheng and Wall 2005, pp. 54). Instead, according to Wei and Frankel (1997), we endeavor to estimate the exact effects of geographical variables (EQ, $SIZE$, $COAST$) that are time constant. The inclusion of country dummies will undermine these efforts, because the time-constant geographical variables are hidden from analysis as they are subsumed into the fixed effects (see also Vietze 2008). A widely described problem in pooled panel

estimations, with respect to fixed effects estimations, is the problem of omitted variables (e.g. Cheng and Wall 2005). However, because of the structure of our data, we *must* include country and time constant variables (EQ , $SIZE$, $BIRDS$, and WHS). Thus, we use an ordinary least square estimation model.

The correlation matrix of the main explanatory variables is presented in table 2-2.

Table 2-2: Correlation Matrix Chapter 2

	BIRDS	ENBIRDS	WHS	GDP2000	GDP2003	LE	CCORR	POLST
BIRDS	1.000							
ENBIRDS	0.1675	1.000						
WHS	-0.0242	-0.1342	1.000					
GDP2000	0.2499	0.1190	0.3062	1.000				
GDP2003	0.1336	-0.0131	0.3420	0.9365	1.000			
LE	0.1368	0.2847	0.3470	0.6485	0.5552	1.000		
CCORR	0.2233	0.1287	0.3009	0.8845	0.8605	0.5680	1.000	
POLST	0.1494	0.1248	0.1860	0.6524	0.6183	0.4676	0.7700	1.000
LAW	0.1837	0.1556	0.3263	0.8734	0.8449	0.6071	0.9682	0.8147
VOICE	0.0592	0.1598	0.3330	0.6966	0.7118	0.5437	0.7898	0.7397
EQ	-0.1526	-0.0668	0.3636	0.5382	0.5697	0.5503	0.5417	0.5167
COAST	0.6202	0.2155	0.0024	0.3473	0.2709	0.2491	0.2893	0.2380
BORD	-0.2206	-0.2594	-0.0685	-0.2224	-0.1786	-0.1628	-0.2451	-0.2274
POP	-0.0538	0.1631	-0.0787	-0.0455	-0.0372	0.0716	-0.0465	-0.0755
SIZE	-0.0935	0.1697	-0.1888	0.1519	0.1174	0.1240	0.1034	0.0151
IUCN	-0.0298	0.0757	-0.0078	0.0602	0.0701	0.0541	0.0608	-0.0352
NET	0.2282	0.1764	0.3044	0.8715	0.8446	0.6249	0.8556	0.6660

	LAW	VOICE	EQ	COAST	BORD	POP	SIZE	IUCN	NET
BIRDS	0.1837	0.0592	-0.1526	0.6202	-0.2206	-0.0538	-0.0935	-0.0298	0.2282
ENBIRDS									
WHS									
GDP2000									
GDP2003									
LE									
CCORR									
POLST									
LAW	1.000								
VOICE	0.8289	1.000							
EQ	0.5761	0.5433	1.000						
COAST	0.2733	0.1747	0.0101	1.000					
BORD	-0.2278	-0.2650	0.0378	-0.3003	1.000				
POP	-0.0085	-0.0647	0.0075	-0.0496	0.4059	1.000			
SIZE	0.0971	0.0486	0.0459	-0.1049	0.2966	0.5294	1.000		
IUCN	0.0762	0.119	-0.1939	0.0703	0.0890	-0.0323	-0.0087	1.000	
NET	0.8580	0.7602	0.5792	0.3445	-0.2506	-0.0369	0.1472	0.0942	1.000

Source: Own estimations.

In the following empirical assessments, we work with all countries available in the sample. We do not distinguish between developing and developed countries.

2.3.1 Biodiversity and Comparative Advantage

The first hypothesis states that biodiversity is influencing the comparative advantage of countries. The higher the biodiversity abundance in a country, the higher is the RCA-index for tourism in this country. We add the current GDP per capita as a proxy for the state of development (expected sign negative), the number of World heritage sites (positive) and the length of the coastline (positive) as control variables. For a test of this hypothesis, we apply the following OLS estimation:

M1

$$RCA_i = \beta_0 + \beta_1 BIRDS + \beta_{1+j} x_{1+j} + \varepsilon_i$$

$$x_{1+j} \text{ representing controls, namely } GDP2003, WHS \text{ and } COAST$$

Table 2-3: Biodiversity and Revealed Comparative Advantage

	I	II	III	IV
Constant	0.467***	0.742***	0.741***	0.724***
	(4.803)	*(6.741)*	*(6.684)*	*(6.469)*
BIRDS	2.597***	2.628***	2.767***	2.415***
	(4.267)	*(4.627)*	*(3.963)*	*(3.161)*
GDP2003		-3.09E-05***	-3.08E-05***	-3.08E-05***
		(-4.483)	*(-4.438)*	*(-4.436)*
WHS			-41.3	-56.5
			(-0.394)	*(-0.535)*
COAST				0.487
				(1.127)
R²adj	0.1218	0.2365	0.2296	0.2314
N	125	124	123	123

Dependent variable is the RCA-index in 2003 as calculated above.
Absolute t-values in parenthesis.
* Significant at the 90 percent level.
** Significant at the 95 percent level.
*** Significant at the 99 percent level.

The interpretation of table 2-3 is fairly simple. The abundance of biodiversity has a positive impact on the RCA-index. Countries with a rich biodiversity have a comparative advantage in tourism services and are able to exploit it. At the same

time, these countries have a relatively low GDP per capita, implying that the potential for convergence is given. Both results make sense and are in line with the theoretical reasoning. These two results remain robust, even if we introduce further control variables, i.e. the number of UNESCO world heritage sites and the length of the coastline. The latter variables do not improve our estimates, which is probably due to the fact that the RCA index is directed at relative trade flows. These variables may rather influence absolute flows (tables 2-4 and 2-5).

2.3.2 Biodiversity and Tourism Receipts: The Short-Term Perspective

The next function we estimate is directed at absolute receipts from tourism, i.e. trade flows. Therefore, it can be interpreted as an aggregate demand function for tourism services by foreigners. As we take the short-term perspective, we analyze the loss of biodiversity. We expect a negative impact of potential biodiversity loss, namely the share of endangered bird species in all bird species living in a country, on inbound tourist receipts per capita. The additional determinants of inbound tourism receipts of a country depend on roughly the same exogenous control variables as in model 1. However, we expect that the GDP per capita in the host country is positively influencing inbound tourism receipts per capita, as foreigners expect certain standards in the host country. As tourists plan some time in advance (Lim 1997a, 1997b), we use data of 2000. Similarly, life expectancy can be interpreted as a proxy for personal security and the quality of the country's health system (positive). The distance to the equator increases the attractiveness for tourist.

M2

$$TR_i = \beta_0 + \beta_1 ENBIRDS + \beta_{1+j} x_{1+j} + \varepsilon_i$$

$$x_{1+i} \; representing \; controls, namely \; GDP2000, WHS, LE, EQ \; and \; COAST$$

Table 2-4: Endangered Biodiversity and Tourism Receipts: Empirical Evidence

	I	II	III	IV
Constant	38.5	-856*	-874***	-1,149**
	(0.383)	*(-1.843)*	*(-3.630))*	*(-2.875)*
ENBIRDS	-2,228**	-3,035*	-2,896*	-4,616**
	(-2.001)	*(-1.843)*	*(-1.831)*	*(-2.055)*
WHS	250,281***	273,977***	276,187***	275,827***
	(14.360)	*(16.638)*	*(17.212)*	*(12.687)*
GDP2000	0.052***			
	(3.772)			
LE		21.78***	22.28***	28.33***
		(3.933)	*(3.772)*	*(3.393)*
EQ		0.029	-0.58	
		(0.007)	*(-0.128)*	
COAST	223.8	85.9		198.3
	(1.226)	*(1.108)*		*(1.143)*
R^2adj	0.5843	0.4859	0.4872	0.3700
N	159	149	149	161

Dependent variable is the amount of Tourism Receipts per capita in 2003.
Absolute t-values in parenthesis.
* Significant at the 90 percent level.
** Significant at the 95 percent level.
*** Significant at the 99 percent level.

The results support our second hypothesis. A potential biodiversity loss discourages international tourism; the result is robust when other control variables are added. The same holds with the positive impact of GDP on inbound tourism receipts and the number of world heritage sites. Whereas the latter are attracting foreign demand for domestic tourism services, potential biodiversity loss is deterring tourists. However, the explanatory power of other variables (with the exception of life expectancy) is relatively low, but the signs are as expected.

2.3.3 Biodiversity and Tourism Receipts: The Long-Term Perspective

Again we estimate an aggregate demand function for tourism services by foreigners, employing all of the foregoing and some additional exogenous variables to explain inbound tourism receipts of a country. Instead of biodiversity loss, we employ actual biodiversity abundance ($BIRDS$). We expect a positive influence from the presence

of bird species to inbound tourism receipts per capita. For the rest of the control variables we also expect a positive sign.

M3

$$TR_i = \beta_0 + \beta_1 BIRDS + \beta_{1+j} x_{1+j} + \varepsilon_i$$

$$x_{1+i} \text{ representing controls, namely } GDP2000, WHS, LE, CCOR, POLST, LAW, VOICE, EQ, COAST, BORD, IUCN \text{ and } NET$$

Table 2-5: Biodiversity and Tourism Receipts: Empirical Evidence

	I	II	III	IV	V	VI	VII	VIII	IX
Constant	-145.7	595.7***	-203.9	-211.21	-71.35	296.8***	301.7***	306.0***	352.5***
	(-1.488)	*(-3.184)*	*(-0.725)*	*(-0.722)*	*(-1.552)*	*(5.519)*	*(4.850)*	*(5.457)*	*(4.607)*
BIRDS	1,905**	2,447**	2,149**	2,167**	1,004.1***	1,803**	2,856*	1,793**	2,044**
	(2.056)	*(2.340)*	*(2.068)*	*(2.048)*	*(3.004)*	*(1.993)*	*(1.895)*	*(2.029)*	*(2.055)*
WHS	219,390***	236,164***	236,556***	236,690***	916,134**	245,049***	232,126***	236,934***	234,538***
	(9.663)	*(10.599)*	*(10.679)*	*(10.499)*	*(2.069)*	*(12.236)*	*(10.033)*	*(11.647)*	*(9.938)*
GDP2000	0.048***								
	(3.459)								
LE		9.90***	6.31*	5.98*					
		(3.423)	*(1.912)*	*(1.888)*					
CCORR						372.7***			
						(4.074)			
POLST							290.7***		
							(3.783)		
LAW								386.6***	
								(4.193)	
VOICE									3754.7***
									(3.690)
EQ		9.10*	11.07**	11.47**	2.001				
		(1.972)	*(2.333)*	*(2.143)*	*(1.464)*				
COAST	131.8	0.593	-21.55	-19.88					
	(0.832)	*(0.015)*	*(-0.660)*	*(-0.608)*					
BORD			-58.12**	-59.58**					
			(-2.160)	*(-2.301)*					
IUCN				1.837	8.97*				
				(0.418)	*(1.788)*				
NET					0.8528***				
					(4.594)				
R^2adj	0.6128	0.5311	0.5394	0.5364	0.5131	0.5912	0.5676	0.5916	0.4240
N	159	149	149	149	117	159	152	159	160

Dependent variable is the amount of Tourism Receipts per capita in 2003.
Absolute t-values in parenthesis.
* Significant at the 90 percent level.
** Significant at the 95 percent level.
*** Significant at the 99 percent level.

The results in table 2-5 indeed support the third hypothesis. Those countries rich in biodiversity are attracting high inbound tourism receipts per capita. This result is absolutely robust across all nine estimations. Our finding implies that it is sensible to assign the property rights of biodiversity to preserve biodiversity in the long run. The ratio of IUCN protected areas per total land area is used as an additional proxy for (imperfect) public assigned property rights of biodiversity, because in such protected

areas the overuse of biodiversity is not permitted, the not exhaustible use for tourism purposes however is. This variable shows the right sign but is not significant, except in estimation V in which $IUCN$ is significant at the 90 % level. Nevertheless, the result is encouraging as anecdotal evidence shows. Muir-Leresche and Nelson (2000) describe that in the past 30 years, Namibia and South Africa have given private landowners full control (and the full opportunity to profit) over the use of wildlife of their land. Consequently, wildlife tourism on private land has boomed. This task has had more success in promoting biodiversity in the southern African region than any other policy measure.

The other control variables, high GDP per capita ($GDP2000$) or high life expectancy (LE), good governance expressed with the World Bank governance indicators ($CCORR$, $POLST$, LAW, $VOICE$), as proxy for safety are relevant predictors for tourists' choice of a destination.[16] A high number of world heritage sites (as control for the 'cultural endowment' of a country) seemed to be beneficial for inbound tourism. For example, Rome and Athens but also Mexico, Peru and Guatemala would rank high in terms of cultural and historical outstanding UNESCO world heritage sites that stimulate substantial amounts of there tourism. Moreover, a mild climate (increasing distance to the equator) and good communication possibilities (a high rate of internet access) are also important for the demand for tourism, as tourists care for complementary goods and services. The higher the number of national borders the lower are the tourism receipts. Because long-range travelers generate high tourism receipts but will be discouraged by cross-border mass tourists, this finding is astonishing only at first glance, as the number of national borders is a typical determinant promoting the demand for mass-tourism (low travel costs), which is often not linked with high tourism receipts (see chapter 5).The variable length of the coast-line in relation to the size of the country (as a proxy for beaches) does not add much to the explanatory power of the model.

[16] As in regression model 2) we do not use $GDP2000$, LE, $CCORR$, $POLST$, LAW and $VOICE$ simultaneously in the same estimation because they are highly correlated. This counts also for LE and $CCORR$, $POLST$, LAW and $VOICE$. See Table 2-2.

2.4 Summary and Policy Conclusions

In this paper we discuss how biodiversity contributes to trade structures. While we are able to find a robust positive impact of biodiversity on the comparative advantage in tourism services in poor countries, the growth potential of sustainable tourism can be seen indirectly via absolute inbound tourism receipts per capita. These are positively influenced by the richness of biodiversity and negatively determined by a potential biodiversity loss. These results support the idea that sustainable tourism is growth friendly, although it do not provide strong evidence. It is necessary to learn more about price and income elasticities for sustainable tourism. This is done in chapter 3. Nevertheless, our results give us an indirect and encouraging hint that it makes sense for developing countries to preserve their biodiversity by assigning the property rights of these natural resource to private or governmental land owners or even to invest into more biodiversity.

3 What's Pushing International Tourism Expenditures?

3.1 Introduction

In chapter 2 we discussed the determinants influencing the attractiveness of a destination country. However, to derive answers whether and how tourism can contribute to sustainable development, the influencing factors of both – the demand and the supply side – of this industry must be understood. Consequentially, the second step in getting insights into the tourism industry is to take a look on the countries of origin and in particular the socio-economic parameters that influence tourists' demand of traveling abroad in particular.

Introductorily, to highlight the importance of the trading good 'tourism' some figures on total tourism expenditures from the introduction are presented. According to the World Tourism Organization (2007b), international tourism expenditures grew to US$ 856 billion (625 billion Euro) in 2007, corresponding to an increase in real terms of 5.6 per cent in 2006. Receipts from international passenger transport are estimated at US$ 165 billion, adding up the total international tourism revenues (including international passenger transport, i.e. visitor exports) to more than US$ 1 trillion, which represents approximately 6 per cent of worldwide exports of goods and services. Table 3-1 gives a comparison of the top ten largest tourism countries of origin respective destination with the world's top trade countries in 2002 (year of latest collected non estimated country data). The table shows that most of the countries that rank first in tourism expenditures also rank first as tourism recipient and trade countries. Due to the increasing economic power of the tourism industry and its potential for the economic development of developing countries (DCs), it seems reasonable to highlight the determinants of tourism demand.

Table 3-1: Top Ten Tourism and Trade Countries

Rank	2002 Absolute Tourism Expenditures		2002 Absolute Tourism Receipts		2002 Absolute Trade (export + import)	
	Country	mio. USD	Country	mio. USD	Country	bill. USD
1	USA	58.044	USA	66.605	USA	1896.3
2	Germany	52.483	France	32.329	Germany	1106.8
3	UK	41.511	Spain	31.731	Japan	753.9
4	Japan	26.656	Italy	26.672	France	661.1
5	France	19.460	China	20.385	UK	624.9
6	Italy	16.841	UK	20.375	China	620.8
7	China	15.398	Germany	19.243	Italy	494.0
8	Netherlands	12.921	Turkey	11.901	Canada	479.9
9	Hong Kong	12.418	Austria	11.239	Netherlands	464.1
10	Canada	11.679	Canada	10.691	Belgium	411.4

Data Source: World Tourism Organization (2007b), WTO (2003).

Therefore, this chapter 3 concentrates on demand factors of outbound tourism expenditures. To deal with this issue, a literature review on tourism demand models follows in the next section. Based on this review we derive five hypotheses in section 3.3 which will be empirically analyzed in section 3.4 using data from the World Tourism Organization (2007b). Section 3.5 concludes chapter 3.

3.2 Literature Review

In this section we briefly discuss the importance of tourism for the developing processes by reviewing the literature about tourism supply and demand modeling. In DCs international tourism as a superior good may well become an important factor of economic development as demand increases above average to income (income elasticity above one) (e.g. Brau et al. 2003; Eilat and Einav 2004; Croes and Vanagas Sr. 2005; Garín-Muňoz 2006; Vogt 2008). Because in every destination tourists demand a number of goods and services e.g. food, accommodation, transportation, entertainment and local handcrafts as souvenirs, it stimulates new economic activity. To satisfy this demand, especially in Least Developed Countries (LDCs), the current level of production needs to increase. Thus, tourism provides

many more positive effects on the economy besides an increase in production and income as direct effects in tourism production. Since the tourism sector is labor intensive this tends towards an increase in employment in most sectors (Lim 1997b; Nijkamp 1998; Deloitte & Touch, iied and odi 1999; Neto 2003). Another indirect effect is that international tourism may enforce the political leaders in the country of destination to approve more civil rights or open the country for international trade. Indeed, these expected positive effects which are particularly relevant for LDCs, with mostly high rates of unemployment, low levels of GDP per capita, bad governance and difficulties in entering the world market, require the development of *sustainable* tourism (Freytag and Vietze 2007).

In the light of these assumed positive effects tourism may have on economic development, an important research question to address is which determinants can pull and push the demand for tourism in countries of destination, respective origin. There are some explaining pull-factors for international tourism arrivals such as nature, price level, safety[17], infrastructure and educational level[18]. Also entertainment and sightseeing tours in a certain region or country play a prominent role in the destination choice of tourists. Proxies for visiting tourism sights and entertainment activities may be such countable factors in the country of destination like the number and quality of beaches, bars, sport facilities, museums, memorial sites, the quantity and quality of accommodation facilities and the like. The existence of an embassy of the origin country also seems to enhance the attractiveness of a destination (Gil-Pareja et al. 2007). In addition, geographical aspects such as the number of directly neighboring countries or the distance to rich countries may play a role. Especially, a high level of biodiversity as a direct impact factor for sightseeing activities (safari tours etc.) and an indirect influence for “nice nature”, determines the demand for tourism positively (e.g. Nijkamp 1998; Muir-Leresche and Nelson 2000; Ashley and Elliott 2003; Creaco and Querini 2003; Croes and Vanagas Sr. 2005; Valente 2005;

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[17] Eilat and Einav (2004) show in three-dimensional panel data analysis on determinants of international tourism that the political risk is quite important for the choice of destination, while the price level only matters for tourists to developed countries.

[18] Eugenio-Martin et al. (2004) try to explain tourist arrivals conditional on GDP and other control variables such as safety, prices and educational level, and investment in infrastructure empirically. Their results provide evidence that low-income countries seem to need an adequate level of infrastructure, education and development to attract tourists, while medium-income countries need high levels of social development like health services and relatively high GDP per capita levels. Finally, the results show that the price level of the destination country in terms of exchange rate and purchasing power parity is irrelevant for tourism growth.

Garín-Muñoz 2006; Freytag and Vietze 2006, 2009, 2010). Zhang and Jensen (2007) confirm by a panel data analysis, dealing with the supply-side of tourism flows, that the country fixed effects are highly relevant for the destination choice. They conclude – albeit without a proof – that this result depends on the natural endowment and cultural heritages of the respective country. Freytag and Vietze (2006, 2009) empirically analyzed whether a rich biodiversity is a comparative advantage of tourism countries. They find that LDCs seem to have a comparative advantage in nature based tourism, and that the incidence of birds as the probably best explored taxonomic group has a positive impact on inbound tourism receipts per capita.

Consequently, some tourism researchers concentrate also on the role of destination development. For instance Prideaux (2000) shows how the transport system is relevant for destination developments. Murphy et al. (2000) and Melián-González and García-Falcón (2003) examine the role of products and services to destination competitiveness. They find that several supply-side related factors (such as accommodation quality, resources, destination environment, tourism infrastructure, and perceived trip value) can influence tourist's intention to return. Beerli and Martín (2004) tested and validated the same factors from a sociological perspective and conclude that the experience accumulated by former traveling, and the socio-demographic circumstances in the country of origin, result in tourist' being more tolerant when assessing the destination because they know other realities of tourism that serve as points of comparison. These results are in line with most empirical works which analyze differences in perceived image depending on cultural factors in the countries of origin (e.g. Vietze 2008). Similar results have also been developed considering the effects of tourist's motivation and satisfaction on destination loyalty (Yoon and Uysal 2005) and the lifecycle of an area (Moore and Whitehall 2005), as both studies find that non-economic effects (i.e. geographical, or cultural variables) also important in explaining tourism demand. Contrarily, Dwyer and Forsyth (1994) find a positive relation between foreign investments and the ability to attract foreign tourism flows and expenditure to the destination country. Many other studies have focused on destination marketing, the image of a destination and market positioning analysis and competitiveness (Crouch and Ritchie 1999; Uysal et al. 2000; Chen and Uysal 2002; Ritchie and Crouch 2003; Enright and Newton 2004, 2005; Trauer and Ryan 2005; Yoon and Uysal 2005). For an overview of the most important explanatory variables of tourism flows, especially from a country-of-destination

perspective see Crouch (1994d), Lim (1997a, 1997b, 1999), Zhang and Jensen (2007), and Song and Li (2008).

We analyze determinants which seem to explain the huge differences in the *expenditures* for international travel between countries. The focus of our examination lies in the push factors – or the demand-side – of international outbound tourism. The analysis of tourism-expenditures has prevailed in the literature as the appropriate framework to estimate the international tourism trade between two or several pairs of countries (Askari 1971; Barry and O'Hagan 1972; Crouch 1994c, 1994d, 1999; Witt et al. 1994; Lim 1997a, 1997b, 1999; Morley 1998; Sinclair 1998; Croes and Vanagas Sr. 2005; Garín-Muñoz 2006; Vietze 2008; Vogt 2008). In most cases, these demand models, in which just one or a few destinations are included, measure price- and income elasticities of tourism receipts from a country of origin to a particular country of destination. Although the demand for international tourism is influenced by many factors, nearly all of these tourism demand studies focus on economic factors, primarily income, in estimating fluctuations of tourism expenditures (Lim 1997b, 1999; Zhang and Jensen 2007; Song and Li 2008).

3.3 Hypotheses

This section of the paper is dedicated to derive five hypotheses from the considerations in the tourism demand literature above. Our question is whether and which explanatory variables exist beside the assumed impact of per capita income. We assess this question for a broad sample of host countries without considering a specific origin – destination relation. Of course, demand-side models can not explain tourism flows in general as unlike as supply-side models can do this. But beside the great impact of the attractiveness of the potential country of destination, socio-economic factors in the country of origin as well play a crucial role in the decision of traveling abroad or not.

According to most demand models we claim in a **first hypothesis** that a high GDP per capita is one of the main drivers for outbound tourism expenditures per capita. This is standard in modeling tourism demand as shown by Lim (1997a, 1997b, 1999), and Song and Li (2008). In order to control for most exogenous geographic effects

we add the country's size, the population (in relation to the size of the respective country), and the number of land borders to this *basic model*, as these variables may have a direct impact on tourism expenditures (see Gil-Pareja et al. 2007; Zhang and Jensen 2007). As the country area limits the free space available, a higher population density may affect tourism expenditures positively (Walsh 1997; Proença and Soukiazis 2005). Therefore, a negative impact of country size on tourism expenditure is expected as we also argue that people in bigger countries travel abroad to a lesser extent than people in smaller countries. Moreover, we expect a positive impact of direct land borders on international tourism expenditures as it is assumed that a high number of neighboring countries enhances the opportunities for traveling abroad. Contrarily, the attractiveness of domestic tourism of a country as the main competition of outbound tourism is included in the basic model. For this purpose we include most important geographical factors of inbound tourism as tested empirically by Freytag and Vietze (2009, 2010); the length of coastline, the number of UNESCO world heritage sites (both in relation to the country's size), and the distance to equator (see Freytag and Vietze 2006, 2007; 2009; for an overview of inbound tourism determinants see Crouch 1995, Lim 1997a, 1997b, Li et. al. 2005). It is assumed by the literature above that UNESCO World Heritage Sites and the length of coastline have a negative impact on outbound tourism expenditures, while the effect of distance to equator is unclear.

The **second hypothesis** reflects the impact of important sociological, namely demographical and educational factors, on tourism expenditures. Therefore, we expand our basic model mentioned above to test whether life expectancy and literacy rate in the country of origin has an impact on traveling abroad. The hypothesis of the *socio-economic model* is as follows: As an indicator for a high quality of life, a good health system and the absence of crime and armed conflicts, we use the life expectancy rate as a non monetary proxy for the "level of development" of a country. We argue that tourism is a superior or luxury good so that tourism expenditures should also increase with the developmental level. Additionally, education may affect the ability to travel positively, as some intercultural skills are required to travel abroad (see e.g. Lim 1997b; Seddighi and Theocharous 2002; Phakdisoth and Kim 2007). In other words, our second hypothesis states that there should be a positive correlation between the life expectancy as well as the literacy rate and the amount of tourism expenditures per capita.

The **third hypothesis** is expressed in our *openness model* which claims that outbound tourism in general demands both an open economy and an open society. While the openness to international trade is measured directly by the ratio of external trade to GDP, we measure the openness of the country's society regarding to tourism via the tourism receipts per capita of the respective country. Our hypothesis is that openness to trade as well as tourism receipts per capita affect tourism expenditures positively. While openness to trade is also used by Zhang and Jensen (2007), measuring an open society via tourism receipts per capita is unusual in foregoing studies on tourism. More specific, this hypothesis is new in tourism research and will be investigated empirically below. The theoretical ground for expecting a positive correlation between tourism receipts and expenditures is that there may exist something like a cultural openness or hospitableness for tourism, which affects the development of the domestic tourism industry as well as the demand for outbound tourism. Moreover, table 3-2 shows that a couple of countries with the highest amount of tourism expenditures per capita are recipients of the highest per capita amounts on tourism and merchandise and service trade as well.

Table 3-2: Top and Least Ranked Eleven Tourism and Trade Countries

Rank	2002 Tourism Expenditures per Capita		2002 Tourism Expenditures per Capita		2002 Tourism Receipts per Capita	
	Country	Country	Country	USD per capita	Country	USD mio. per capita
1	Luxembourg	Luxembourg	Cayman Islands	5892.622	Luxembourg	155.432
2	Bermuda	Bermuda	Aruba	3504.854	Hong Kong	72.127
3	Aruba	Aruba	Macao	2696.065	Singapore	72.074
4	Iceland	Iceland	San Marino	1800.681	Ireland	60.296
5	United Arab Emirates	United Arab Emirates	US. Virgin Islands	1592.068	Belgium	55.948
6	Hong Kong	Hong Kong	Luxembourg	1548.112	Netherlands	42.659
7	Kuwait	Kuwait	Bahamas	1534.014	Austria	34.236
8	Neth. Antilles	Neth. Antilles	Bermuda	1489.183	Denmark	34.148
9	Norway	Norway	Antigua and Barbuda	1458.008	Switzerland	34.092
10	Austria	Austria	Neth. Antilles	1443.103	Norway	32.602
11	Denmark	Denmark	Palau	1233.623	Neth. Antilles	28.774
. . .	. . .	. . .	. . .	. . .	. . .	. . .
198	Malawi	Malawi	Papua New Guinea	3.2615	Sudan	0.1642
199	Sudan	Sudan	Malawi	3.1222	Madagascar	0.1341
200	Nepal	Nepal	Myanmar	3.0601	Tanzania	0.1331
201	Guinea	Guinea	Uzbekistan	2.8792	Myanmar	0.1221
202	Burundi	Burundi	Ethiopia	2.4606	Nepal	0.1124
203	Niger	Niger	Pakistan	1.8990	Uganda	0.1022
204	Bangladesh	Bangladesh	Bangladesh	1.1918	Sierra Leone	0.0959
205	Cambodia	Cambodia	Nigeria	1.1177	Central African Rep.	0.0947
206	Myanmar	Myanmar	Tajikistan	0.7528	Rwanda	0.0656
207	Ethiopia	Ethiopia	Burundi	0.7512	Ethiopia	0.0590
208	Tajikistan	Tajikistan	Congo, Dem. Rep.	0.2914	Burundi	0.0384

Data Source: World Tourism Organization (2007b), WTO (2003).

To test the openness of the society more explicitly, we formulate a *governance model* which assumes that civil and political rights affect tourism expenditures positively. Therefore, the **fourth hypothesis** claims that good governance is positively correlated with tourism receipts per capita (similar Phakdisoth and Kim 2007; Vietze 2008). Besides the tautological effect that freedom to travel is an immediate outcome

of political freedom, we argue that good institutions in the country of origin can obtain people to travel in foreign countries as they can be sure that their property's (and – of course – relatives) are in a good order when returning.

The **fifth hypothesis** focuses on information possibilities: A high level of information infrastructure in the country of origin could be beneficial for outbound tourism, as it helps the searching and booking of potential holiday destinations. Consumers cannot examine the quality of tourism supply before purchasing, as it is an intangible product. Tourists therefore face higher risk and uncertainty when demanding tourism products than buying other, more tangible products. Consequently, their need for reliable information about the destination, the airline and the like is stronger than that of consumers of material products. By good information and communication infrastructure tourists are able to gain additional information on their holiday trip in advance. In other words, we expect a positive impact of the availability of information possibilities on outbound tourism expenditures. Thus, our further called *information-infrastructure model* is also standard in modeling tourism demand (e.g. Lim 1997a, 1997b, 1999; Phakdisoth and Kim 2007; Song and Li 2008).

3.4 Empirical Evidence

The following section of this chapter is dedicated to an assessment of theoretical hypotheses. While the first part gives an overview about the data that is used, the following part presents a regression model and the estimated outcome. In the third part we extent the model to eliminate the strong impact of the per capita income on tourism expenditures per capita.

3.4.1 The Data

Although the majority of studies use tourism arrivals, the literature review on econometric tourism demand models show that there is no single standard used measure of tourism flows, the majority of the studies in this area define international tourism demand by using one of the following measures: The number of foreign

visitors crossing the border (tourism arrivals), the number of nights spent by visitors from abroad, tourism receipts (respective tourism expenditures), or the length of stay of visiting tourists (Crouch 1994c, 1994d; Li et al. 2005; Proença and Soukiazis 2005; Song and Li 2008). This paper concentrates on the determinants of outbound tourism of the country of origin. The dependent variable is – as in lots of tourism analyses (Song and Li 2008)[19]– the flows of outbound tourism expenditures (in the year 2002) (TE); as reported by the World Tourism Organization (2007b) for 208 countries.[20] As stated by Kanellakis (1975, p. 17) '*the dependent variable [in tourism studies] is an aggregate of several separate activities definable in money terms and not a quantity as in the conventional way of estimating such coefficients*'. However, the issue of an appropriate demand measure is further circumscribed by the fact that tourism demand in monetary terms represents both an amount of expenditure and the quality of consumption as well and is therefore not unproblematic (Smeral 1988; Crouch 1994d). As tourism arrivals do not control for either the spending intensity (actual value consumed) or the length of the tourist stay at the destination country, measuring demand in real monetary terms is preferable (Anastasopoulos 1984; O'Hagan and Harrison 1984). Hence, flows of tourism expenditures (respectively receipts) is superior to flows of tourism arrivals (Zhang and Jensen 2007; Vietze 2008).

From the five hypotheses derived in the last section we set up the empirical models on demand factors in the country of origin as follows. As mentioned above, in most analyses (see Lim 1997a, 1997b; Song and Li 2008) GDP per capita of the country of origin (in purchasing power parity; year 2002; data source is IMF 2007) (GDP) is pointed out as the most important factor which has an impact on the peoples decision to travel abroad. According to our hypotheses a set of political, geographical and trade indicators is added. The *basic model* contains the following variables:

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[19] Crouch (1994d) indicates that of the 85 tourism studies reviewed, 48 per cent chose tourists arrivals as the measure of demand. To control the size effect we use tourism expenditures as per capita measure. Li et al. (2005) compared studies published in the 1990's to tourism demand studies prior to 1990, and find that Tourist arrivals was and still is the most common measure, followed by tourist expenditure.

[20] The currently latest data available are from 2003, but these are mostly estimations. We use data from the year 2002 which are updated in 2008 and by now contains only fixed measures and no estimated content (World Tourism Organization 2008).

- the number of inhabitants (in 2002) in relation to the size of the respective country (POP) as the population density in the country of origin may affect the inhabitants to travel abroad (Heston et al. 2006);
- the size of the country ($SIZE$) in square kilometers (CIA 2008); and
- the number of national borders ($BORD$) as a proxy for the geographical situation of the country of origin (island or landlocked) (CIA 2008).

The variables below proxy determinants that affect the demand for domestic tourism (see Freytag and Vietze 2009, 2010), which is the main alternative to outbound tourism.

- the length of the coast line (in km) in relation to country size in square km ($COAST$) as a proxy for beaches (CIA 2008);
- the number of UNESCO world heritage sites (in 2002) in relation to country size in square km (WHS) as a proxy for the important historical and cultural sites on tourism (UNESCO 2005); and
- the distance of the country to the equator in degree of longitude (EQR) as a proxy for climate in the country of origin (CIA 2008).

Regarding the *socio-economic model* the following variables are introduced in the regression:

- the life expectancy (in 2002) (LE) as a proxy for safety and quality of life in the country of origin (CIA 2008); and
- the literacy rate (LIT) as a proxy for the educational standard which is expected to be an important factor in determining the ability to travel to foreign countries (CIA 2008).

To run our *openness model*, we use the following variables:

- the inbound tourism receipts per capita (TR) in 2002, as important variables affecting the cultural openness or hospitableness for outbound tourism (World Tourism Organization 2007b); and
- the openness to trade measured as the sum of imports and exports in relation to GDP in 2002 ($OPEN$), because tourism as part of trade in services is highly sensible to open markets (Heston et al. 2006).

As it is our aim to investigate the impact of the quality of governance and institutions in the origin country on tourism demand, our *governance model* include

- the World Bank governance indicators (in 2002) for Control of Corruption ($CCORR$), Effectiveness of Governance ($GOVEFF$), Political Stability ($POLST$), Rule of Law (LAW) and Voice and Accountability ($VOICE$) (Kaufmann et al. 2006).

Moreover, our focus is on the examination of the effect of information and communication infrastructure in the country of origin on tourism. Our *information-infrastructure model* states that a higher quality of information infrastructure could promote tourist's ability to travel to foreign countries, as tourists gain more information in advance. The following variables are included in the regression:

- the number of internet (NET) and telephone (TEL) accesses as well as TV sets (TV) in the year 2002 (all measured in per thousand inhabitants) as proxies for information access (World Bank 2007).

The descriptive statistics referring to the main variables outbound tourism expenditures per capita ($TE^{p.C}$), outbound tourism expenditures per GDP ($TE^{p.GDP}$), tourism receipts per capita (TR), GDP per capita (GDP) and openness to trade ($OPEN$) are reported in table 3-3.

Table 3-3: Descriptive Statistics Chapter 3

	MIN	**MAX**	**Mean**	**Median**	**Standard dev.**	**N**
$TE^{p.C}$	0.30	4751.89	274.28	53.32	587.74	158
$TE^{p.GDP}$	0.0003	0.0960	0.0142	0.0093	0.0157	151
TR	0.17	11797.11	552.67	70.04	1486.04	167
GDP	525.71	59191.91	9420.30	5555.56	10031.98	177
$OPEN$	2.02	369.65	87.88	82.36	48.39	183

Source: Own estimations.

In foregoing studies, ordinary least-squares (OLS) multivariate regression analysis has been the most widely used estimation technique. According to Crouch (1994d), its advantages include to carry out “what if” forecasting, the ability to model cause and effect, and to provide statistical measures of accuracy and significance. That is why OLS-regressions are the most used technique in estimating tourism demand (compare Li et al. 2005).

However, to use an OLS model some statistical conditions must be fulfilled. In statistics, a frequent assumption in linear regression is that the disturbances ε_i have the mean zero and same variance; and are uncorrelated. If this is the case, then – according to the Gauss-Markov theorem – the ordinary least-squares (OLS)-estimates of β_i satisfy the assumption of being BLUE (best linear unbiased estimator), which means that an OLS regression is required. If not, heteroskedasticity in the estimated residuals will occur. Although, this does not cause OLS coefficient estimates to be biased nor inconsistent; but the variance (and standard errors) of the coefficients tends to be underestimated, which is inflating t-scores and sometimes making insignificant variables appear to be statistically significant. Heteroskedasticity-consistent standard errors (HSCS), first proposed by White (1980), are used to deal with this problem by altering normally-distributed standard errors. For estimation purpose, a HCSE adjusted *general least square* (GLS)-model is applied.

As it is presumably that our cross-country variables are heterogeneous we generally run White-Heteroskedasticity residual tests. These tests approve our assumption in all regressions. Thus, the White (1980) – HCSE adjusted GLS-estimator will be used in these estimations. We use a linear-estimation model, assuming that the relationship between the output and its determinants is linear. Lim (1997b) summarized the key features of the *linear model*s: it is computationally straightforward when there is temporal aggregation of the dependent variable; it does not permit the random errors in the equation to be normally distributed; both the dependent variable and the set (or subset) of explanatory variables are expressed in levels; and it has constant marginal effects and variable elasticities. Furthermore, the non-adoption of a specific estimation model (e.g. a log function) allows taking an unprepossessed view on the impact factors of tourism demand.

Including a set of time invariant variables (e.g. $SIZE$, EQR, WHS, and $BORD$) in our regression, a country fixed effects panel estimation cannot be applied. Additional, as it is our aim to explain the heterogeneity in tourism expenditures within the world with exogenous socio-geographical variables, we cannot apply the '*fixed-effects modeling [as] a result of ignorance*' (Cheng and Wall 2005, p. 54). Instead, according to Wei and Frankel (1997), we endeavor – like in chapter 2 – to estimate the exact effects of geographical variables that are time constant. The inclusion of country dummies will undermine these efforts; because the time-constant geographical variables are hidden from analysis as they are subsumed into the fixed effects (see also Vietze 2008). Moreover, due to data availability it is impossible to construct a relevant time series. However, because of the structure of our data, we must include time constant variables. A widely described problem in least square estimation with respect to fixed effects panel estimations is the problem of omitted variables (e.g. Cheng and Wall 2005). As shown in this section the adjusted R-squared in all estimations is relatively high; so that the dependent variable is described almost completely by the chosen explanatory variables; and the issue of omitted variables can be neglected. Not negligibly, it is impossible to estimate a panel as we do not have valid time-series data for most of our variables; especially for the proxy variables of governance and information possibilities. To sum up, the HCSE adjusted GLS-modeling estimation is applied. However, to demonstrate the stability we use subsets of the equation in the most regressions stated below.

3.4.2 The Model and the Results

The first question assesses which determinants influence the demand of outbound tourism expenditures in the year 2002 *per capita* ($TE^{p.C}$) for 208 countries[21], as it is reported by the World Tourism Organization (2007b). To analyze this issue, the hypotheses one to five will be estimated empirically. We assume that the demand for tourism, measured by tourist's expenditures, is a function of the country of origin's characteristics or the demand side. For a test of these variables we apply the following three HCSE adjusted GLS estimation models (hypotheses one to three):

[21] List of countries see Appendix 1-A. Due to data availability some countries must be excluded in the respective regressions.

Hypothesis 1:

M0

$$TE_i^{p.C} = \beta_0 + BasicModel + \varepsilon_i$$
$$BasicModel = \beta_1 GDP_i + \beta_2 POP_i + \beta_3 SIZE_i + \beta_4 BORD_i + \beta_5 COAST_i + \beta_6 WHS_i + \beta_7 EQR_i$$

Hypothesis 2:

M1

$$TE_i^{p.C} = \beta_0 + BasicModel + SocioEconomicModel + \varepsilon_i$$
$$SocioEconomicModel = \beta_8 LE_i + \beta_9 LIT_i$$

Hypothesis 3:

M2

$$TE_i^{p.C} = \beta_0 + BasicModel + OpennessModel + \varepsilon_i$$
$$OpennessModel = \beta_{10} OPEN_i + \beta_{11} TR_i$$

The results in table 3-4 do indeed support most of our hypotheses. People in countries with a high per capita income spend more money on outbound tourism than others. This result is – not very astonishing – absolutely robust across all four estimations presented below. So Hypothesis 1 can be confirmed. It is also shown that the more attractive domestic tourism in a country is the lesser are outbound tourism expenditures. The negative signs for WHS and $COAST$ are significant and confirm our expectations. Distance to the equator (EQR) is not stable during the four estimations, but it seems that countries with colder climate (a higher distance to equator) provoke their people to travel to foreign countries. The variable $SIZE$ shows the expected negative sign. The larger sized a country the less attractive it is for the inhabitants to travel abroad. Furthermore, the results confirm that a high population density (inhabitants in relation to the size of the respective country) pushes tourism expenditures.

Table 3-4: Outbound Tourism Expenditures per Capita: Basic-, Socio-Economic- and Openness Model

	M 0	M 1a	M 1b	M 2
Const	-122.69**	-471.91***	-138.92	-380.18***
	(-2.046)	*(-3.281)*	*(-1.346)*	*(-2.748)*
GDP	0.043***			0.0341***
	(3.392)			*(2.257)*
POP	*0.088***	0.150***	0,159***	0.006
	(2.351)	*(5.930)*	*(5.616)*	*(0.092)*
SIZE	-4.34E-05*	-1.88E-05*	-1.52E-05	-2.76E-05**
	(-1.874)	*(-1.683)*	*(-1.375)*	*(-2.312)*
BORD	19.16	-24.698**	-31.577**	27.99**
	(1.274)	*(-1.996)*	*(-2.410)*	*(2.079)*
COAST	6.770	59.701	59.167	-191.07*
	(0.154)	*(0.373)*	*(0.313)*	*(-1.916)*
WHS	-18,313.3*	-60,180.0***	-61,448.5***	-40,230.0***
	(-1.775)	*(-4.929)*	*(-4.446)*	*(-3.216)*
EQR	-4.241	9.580***	10.990***	-3.601
	(-1.268)	*(3.231)*	*(3.735)*	*(-1.441)*
LE		8.217***		
		(3.590)		
LIT			250.68**	
			(2.148)	
OPEN				2.956**
				(2.161)
TR				0.164**
				(2.060)
R^2adj	0.6458	0.1954	0.1797	0.7553
N	141	145	144	135

Dependent variable: Amount of tourism expenditures per capita in 2002.
Absolute t-values in parenthesis.
* Significant at the 90 per cent level.
** Significant at the 95 per cent level.
*** Significant at the 99 per cent level.

As also shown by table 3-4, the higher the number of national borders ($BORD$) the higher are the tourism expenditures per capita in the respective country. That is the expected sign and confirms that people will be pushed to travel abroad if there are more countries in the neighborhood. Similar results are displayed by some studies

dealing with this issue using gravity models (e.g. Eilat and Einav 2004; Kimura and Lee 2006; Gil-Pareja et al. 2007; Phakdisoth and Kim 2007; Vietze 2008).

The socio-economic model examines Hypothesis 2. Since GDP, LE, and LIT are highly correlated (with values of around $corr_{(GDP;i)} = 0.9$), it is statistically impossible use them simultaneously in the estimation.[22] Therefore, at this is the standard method in empirics, we must drop out GDP from these models in order to estimate subsets of the respective model. This is only done for empirical reasons and does not mean neglecting the overwhelming effect of GDP on tourism demand. Life expectancy (LE) shows the expected positive sign; this can be interpreted as follows: People in higher developed countries spend more money for outbound tourism. Moreover, the literacy rate (LIT), a chosen proxy for the educational level of a country, is positively correlated with tourism expenditures. So the socio-economic model seems to be credible to explain the demand factors of tourism.

Confirming hypothesis 3, one of the main result is that countries with a high amount of inbound tourism receipts per capita (TR), and a high merchandise trade volume ($OPEN$) also have large outbound tourism expenditures per capita. This displays that there are joint factors like the openness to trade and the openness to meet other cultures and people which are responsible factors to explain tourism expenditure flows. Countries which are able to attract many foreigners (and their money) to get in for holidays also have a higher request for outbound tourism. The same holds for the openness of a country to international trade. This gives the clear hint that in an open society people are also more open to travel abroad. To investigate this more explicitly, in a last regression we test the openness of the society more directly by using the World Bank governance indicators as a proxy for good institutions. As claimed in hypothesis 4, we test if these institutions have a positive impact on the amount of money people spend for outbound tourism. The impact of the institutional quality on outbound tourism expenditures is examined by the following regression[23]:

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[22] Compare correlation matrix in Appendix 2-A.

[23] As described above $GDP, CCORR, GOVEFF, LAW, POLST, and\ VOICE$ are highly correlated, so that we can not use them simultaneously in the estimation. A subsets of the model will be estimated; each regression with one of the governments indicator. Therefore we run these models without GDP and estimate subsets of the respective models as well. Compare correlation matrix in Appendix 2-A.

Hypothesis 4:

M 3

$$TE_i^{p.C} = \beta_0 + BasicModel + GovernanceModel + \varepsilon_i$$

$$GovernanceModel = \beta_{12} CCORR_i + \beta_{13} GOVEFF_i + \beta_{14} LAW_i + \beta_{15} POLST_i + \beta_{16} VOICE_i$$

Table 3-5: Outbound Tourism Expenditures per Capita: Governance Model

	M 3a	M 3b	M 3c	M 3d	M 3e
Const	128.25**	172.86***	63.348**	122.44*	42.40
	(-2.156)	*(2.662)*	*(2.447)*	*(1.726)*	*(0.696)*
POP	0.103***	0.092**	0.115***	0.153***	0.166***
	(3.698)	*(2.582)*	*(4.339)*	*(6.863)*	*(7.082)*
SIZE	-2.80E-05*	-2.89E-05*	-2.54E-05	-1.60E-05	-1.93E-05*
	(-1.674)	*(-1.715)*	*(-1.571)*	*(-1.446)*	*(-1.645)*
BORD	8.233	-1.530	3.820	-15.883	-12.495
	(0.657)	*(-0.119)*	*(-0.313)*	*(-1.132)*	*(-0.903)*
COAST	66.75	33.21	-4.084	-49.34	104.28
	(0.556)	*(0.201)*	*(-0.033)*	*(-0.263)*	*(0.692)*
WHS	-34,890.1**	-35,208.1**	-44,049.0***	-57,036.1***	-67,082.2***
	(-2.520)	*(-2.101)*	*(-3.426)*	*(-4.988)*	*(-5.867)*
EQR	2.652*	2.208	2.470	7.115***	8.477***
	(1.784)	*(1.427)*	*(1.590)*	*(3.473)*	*(3.531)*
CCORR	295.59***				
	(4.539)				
GOVEFF		287.73***			
		(3.920)			
LAW			299.66***		
			(4.343)		
POLST				177.41***	
				(3.093)	
VOICE					154.83***
					(3.259)
R^2adj	0.3423	0.3171	0.3253	0.2271	0.2138
N	145	145	145	139	145

Dependent variable: Amount of tourism expenditures per capita in 2002.
Absolute t-values in parenthesis.
* Significant at the 90 per cent level.
** Significant at the 95 per cent level.
*** Significant at the 99 per cent level.

As shown by the regression results in table 3-5 the existence of good institutions has a positive impact on the amount of tourism expenditures per capita. People in countries with a high level of civil rights (LAW), stable ($POLST$) and effective governance ($GOVEFF$), low corruption ($CCORR$) and a high level of freedom to speak ($VOICE$) spend more money for foreign tourism than such with bad

institutions. First, it is shown that the demand to travel abroad is directly affected by the level of civil rights and political freedom. In other words, freedom to travel is an immediate outcome of political freedom. Second, this circumstantiates our argument that people in open-minded societies are deciding more often to spend their holidays abroad.[24] These results approve our hypothesis 4. The other variables remain stable during the five estimated subsets. The expected outcome referring to the distance to equator (EQR) can be verified: People from countries situated in the temperate zone (a higher distance to equator) decide more often traveling to foreign (warmer?) countries.

Finally, we argue that information possibilities play a crucial role in explaining outbound tourism expenditures. To investigate this argument in hypothesis 5, we run the following model:

Hypothesis 5:

M 4

$$TE_i^{p.C} = \beta_0 + BasicModel + InformationModel + \varepsilon_i$$
$$InformationModel = \beta_{17} NET_i + \beta_{18} TEL_i + \beta_{19} TV_i$$

Although the data availability for these variables are rather low and some countries had to be excluded from the regression (except for the model 4b), the results in table 3-6 show clearly that the amount of (travel-) information is important for tourism expenditures. The more information facilities as measured by internet (NET), telephone (TEL), television (TV)[25] per thousand inhabitants are available within the country of origin the more people can inform themselves on foreign travel opportunities. Of course, there are common causes like the level of development so that one should not over-interpret these results. However, hypothesis 5 can be confirmed. Again, we run these models excluding GDP, and estimate subsets of the respective model, as GDP, NET, TEL, and TV are highly correlated.[26]

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[24] Of course, there may be common causes like the countries GDP per capita, since good institutions often causes high GDP per capita in the respective country.

[25] We also ran regressions dealing with the impact of daily newspapers, radios and PC's, each per thousand inhabitants, on tourism expenditures. The results were quite similar.

[26] Compare correlation matrix in Appendix 2-A.

Table 3-6: Outbound Tourism Expenditures per Capita: Information-Infrastructure Model

	M 4a	**M 4b**	**M 4c**
Const	-62.52	-89.72	-70.08
	(-1.139)	*(-1.328)*	*(-1.271)*
POP	0.085*	0.106***	0.152***
	(1.681)	*(4.645)*	*(3.698)*
SIZE	-2.51E-05*	-4.13E-05**	-2.02E-05
	(-1.820)	*(-2.020)*	*(-1.618)*
BORD	9.758	10.265	-0.164
	(0.657)	*(0.737)*	*(-0.019)*
COAST	1,023.5	-34.31	662.27
	(1.622)	*(-0.402)*	*(1.225)*
WHS	571,687.6	-45,550.3***	1,069,506
	(1.038)	*(-5.459)*	*(1.571)*
EQR	1.062	-2.848	0.798
	(0.586)	*(-1.020)*	*(0.632)*
NET	1.054***		
	(5.495)		
TEL		1.884***	
		(3.601)	
TV			0.633***
			(4.340)
$R^2 adj$	0.5763	0.4460	0.5319
N	115	145	107

Dependent variable: Amount of tourism expenditures per capita in 2002.
Absolute t-values in parenthesis.
* Significant at the 90 percent level.
** Significant at the 95 percent level.
*** Significant at the 99 percent level.

To eliminate the rather overwhelming impact of the GDP per capita we apply further regression analysis. We use the same data and exogenous variables but measuring the impact of the exogenous variables on the amount of tourism expenditures per *unit of GDP.*

3.4.3 Model Extension

As shown in the previous section the GDP per capita has the major impact on outbound tourism expenditures per capita. To control this effect and test the assumed elasticity of this service good, we use in contrast to section 3.4.2 the dependent variable Tourism Expenditures *per GDP* ($TE^{p.GDP}$) in the following estimations. This is also common even though infrequent in tourism studies (Lim 1997a, 1997b; Song and Li 2008). As in all former regressions we run a White-Heteroskedasticity residual test (White, 1980). This test displays that all estimations with the dependent variable *Outbound Tourism Expenditures per GDP* are not heteroskedastic. That is why we use an OLS model, which is in line with the BLUE conditions.

Calculating with the same independent variables as above and expecting the same signs, we regress the variables and indicators as in the previous chapter and assume the same hypotheses 1 till 5. Thus the regression models are as follows:

Hypothesis 1:

M0 $TE_i^{p.GDP} = \beta_0 + BasicModel + \varepsilon_i$

Hypothesis 2:

M1 $TE_i^{p.GDP} = \beta_0 + BasicModel + SocioEconomicModel + \varepsilon_i$

Hypothesis 3:

M2 $TE_i^{p.GDP} = \beta_0 + BasicModel + OpennessModel + \varepsilon_i$

As table 3-7 displays, the findings support our hypothesis 1 to 3, similarly to the estimation results for tourism expenditures per capita shown by table 3-4. The variables openness to trade ($OPEN$) and tourism receipts per capita (TR) are positively related to outbound tourism expenditures per GDP. Peoples with a high cultural (TR) and economic ($OPEN$) openness are willing to spend a higher income share for traveling abroad. As a proxy for the quality of life the variable life

expectancy (LE) has a positive impact on outbound tourism expenditures as well as the literacy rate (LIT) but the impact is still insignificant.

Table 3-7: Outbound Tourism Expenditures per GDP: Basic-, Socio-Economic- and Openness Model

	M 0	M 1a	M 1b	M 2
Const	0.0074***	-0.0065	0.0029	0.0008
	(3.214)	*(-0.899)*	*(0.566)*	*(0.290)*
GDP	8.98E-07***			5.79E-07***
	(7.155)			*(4.387)*
POP	3.83E-06***	5.78E-06***	6.24E-06***	2.23E-06
	(2.845)	*(3.798)*	*(4.102)*	*(1.452)*
SIZE	-1.14E-09**	-7.28E-10	-6.24E-06	-6.73E-10
	(-2.257)	*(-1.253)*	*(-1.064)*	*(-1.448)*
BORD	-0.0002	-0.0008	-0.0010*	1.47E-05
	(-0.563)	*(-1.597)*	*(-1.950)*	*(0.037)*
COAST	-0.0069	0.0052	0.0046	-0.0006
	(-1.346)	*(0.894)*	*(0.762)*	*(-0.117)*
WHS	-0.2331	0.1199	0.4313	-1.035
	(-0.208)	*(0.093)*	*(0.329)*	*(-0.975)*
EQR	-7.07E-05	0.0002**	0.0002**	-3.13E-05
	(-0.920)	*(2.056)*	*(2.373)*	*(-0.431)*
LE		0.0003**		
		(2.335)		
LIT			0.0100	
			(1.534)	
OPEN				7.07E-05***
				(2.715)
TR				6.22E-06***
				(4.413)
R^2adj	0.4548	0.2747	0.2579	0.5670
N	141	141	140	135

Dependent variable: amount of tourism expenditures per GDP in 2002.
Absolute t-values in parenthesis.
* Significant at the 90 percent level.
** Significant at the 95 percent level.
*** Significant at the 99 percent level

The most important finding is that rich countries (in terms of per capita income) spend a higher share of national income for outbound tourism than poorer ones. An increase in GDP will raise the demand for outbound tourism and increase the tourism expenditures by an elasticity exceeding one. This supports the assumption that

outbound tourism is a luxury good.[27] Or in other words: Wealthy people (and countries as well) have a higher demand for outbound tourism the richer they are. This finding is interesting with respect to the role of tourism for economic development. An increasing GDP in developed countries may enforce the impact of tourism as a trigger for development in DCs. As tourism destination countries are mostly countries with a lower per capita GDP (Freytag and Vietze 2007), an increasing world GDP can improve their ability to attract foreign exchange receipts via tourism income.

Except for the distance to equator (EQR) which has a positive impact on outbound tourism expenditures per GDP, the proxies $COAST$ and WHS for an attractive domestic tourism in a country are still insignificant; contrarily to the first regression using tourism expenditure per capita. The remaining variables, particularly population density (POP) and country size ($SIZE$), show the expected sign. These results show that the "closer" the people in a country live, the smaller the respective country, and the colder the climate is, the higher is the share of income expensed for outbound tourism.

Similarly to the regression results in table 3-5 on the impact of institutional factors on per capita measures of tourism expenditure, we establish the following regression to investigate the impact on tourism expenditures per GDP as stated below:

Hypothesis 4:

M 3 $$TE_i^{p.GDP} = \beta_0 + BasicModel + GovernanceModel + \varepsilon_i$$

The results in table 3-8 evidence that countries with good governance (measured by a high level of civil liberties, freedom to speak and a low level of corruption) have a higher share of outbound tourism expenditure per GDP than countries with worse institutions. This result confirms the theoretical assumptions claimed by hypothesis 4: If people are less afraid about the security of their relatives and (real estate) property at home, they spend more of their income for traveling abroad; regardless whether they are able to save money for insurances or time to protect their belongings. The

[27] See also Brau et al. (2003), Eilat and Einav (2004), Croes and Vanagas Sr. (2005), Garín-Muñoz (2006), Freytag and Vietze (2007), Vogt (2008).

other variables show the expected signs (POP, $SIZE$, and EQR) or are not significant ($BORD$, $COAST$, and WHS).

Table 3-8: Outbound Tourism Expenditures per GDP: Governance Model

	M 3a	M 3b	M 3c	M 3d	M 3e
Const	0.0127***	0.0135***	0.0127***	0.0117***	0.0099***
	(5.197)	*(5.121)*	*(5.365)*	*(4.188)*	*(3.733)*
POP	4.17E-06***	4.21E-06***	4.57E-06***	5.73E-06***	6.35-06***
	(2.973)	*(2.840)*	*(3.263)*	*(3.847)*	*(4.255)*
SIZE	-9.05E-10*	-8.87E-10	-8.37E-10	-6.16E-10	-6.61E-10
	(-1.731)	*(-1.625)*	*(-1.589)*	*(-1.090)*	*(1.144)*
BORD	-5.83E-05	-0.0004	-0.0002	-0.0006	-0.0006
	(-0.126)	*(-0.837)*	*(-0.341)*	*(-1.103)*	*(-1.193)*
COAST	0.0065	0.0053	0.0044	0.0031	0.0063
	(1.231)	*(0.967)*	*(0.812)*	*(0.520)*	*(1.078)*
WHS	0.0876	0.2603	-0.0097	-0.2433	-0.0160
	(0.075)	*(0.214)*	*-(0.008)*	*(-0.181)*	*(-0.012)*
EQR	-1.47E-06	1.22E-05	-1.24E-05	0.0001	0.0002**
	(-0.019)	*(0.144)*	*(-0.154)*	*(1.372)*	*(2.081)*
CCORR	0.0080***				
	(6.023)				
GOVEFF		0.0070***			
		(4.805)			
LAW			0.0082***		
			(5.738)		
POLST				0.0051***	
				(3.329)	
VOICE					0.0036**
					(2.255)
R^2adj	0.4068	0.3567	0.3948	0.31131	0.2728
N	141	141	141	135	141

Dependent variable: amount of tourism expenditures per GDP in 2002.
Absolute t-values in parenthesis.
* Significant at the 90 percent level.
** Significant at the 95 percent level.
*** Significant at the 99 percent level.

Finally we test for the impact of information possibilities on tourism expenditure per GDP by the following regression as indicated by our hypothesis 5:

Hypothesis 5:

M 4 $TE_i^{p,GDP} = \beta_0 + BasicModel + InformationModel + \varepsilon_i$

Table 3-9: Outbound Tourism Expenditures per GDP: Information-Infrastructure Model

	M 4a	**M 4b**	**M 4c**
Const	0.0059**	0.0078***	0.0061**
	(2.196)	*(3.210)*	*(2.041)*
POP	3.30E-06	4.20E-06***	5.35E-06**
	(1.339)	*(2.957)*	*(2.056)*
SIZE	-1.43E-09**	-1.11E-09**	-1.12E-09*
	(-2.134)	*(-2.077)*	*(-1.715)*
BORD	0.0001	-0.0003	-0.0002
	(0.258)	*(-0.694)*	*(-0.439)*
COAST	0.0311	0.0055	0.00216
	(1.016)	*(1.033)*	*(0.647)*
WHS	3.998	-0.8653	19.63
	(0.149)	*(-0.720)*	*(0.690)*
EQR	1.33E-05	-5.65E-05	3.70E-05
	(0.150)	*(-0.659)*	*(0.335)*
NET	3.32E-05***		
	(3.554)		
TEL		4.02E-05***	
		(5.696)	
TV			1.68-05**
			(2.179)
R^2adj	0.3689	0.3931	0.3261
N	113	141	106

Dependent variable: amount of tourism expenditures per GDP in 2002.
Absolute t-values in parenthesis.
* Significant at the 90 percent level.
** Significant at the 95 percent level.
*** Significant at the 99 percent level.

As already shown by table 3-6 on tourism expenditure per capita, the model results in table 3-9 also indicate the significantly high impact of information infrastructure on the amount of outbound tourism expenditures (per GDP). A high level of information opportunities in the respective country increases the share of income tourists spend for outbound tourism. These results are significant for all three sub samples (NET, TEL and TV and show the expected positive sign. The other variables except for population density (POP) and country size ($SIZE$) are insignificant. These results confirm our fifth hypothesis that a good information infrastructure in the country of origin is beneficial for outbound tourism, as potential tourists are able to inform themselves on the choices of the tourism industry in the destination countries and enable them to book accommodations and the like in advance.

In summary, all five hypotheses in the extended model can be confirmed. This means that besides the positive impact of the per capita income (and the life expectancy), openness to trade and tourism as well as a high level of institutional quality and information possibilities affect outbound tourism expenditures *per GDP* positively, too.

3.5 Conclusions

In this paper we discuss the determinants which contribute to outbound tourism expenditures. While we are able to find a strict robust positive impact of all economic factors like GDP per capita and the openness to trade on the tourism expenditures per capita as well as tourism expenditures per GDP, most of the sociological factors e.g. the literacy rate and the control variables for the attractiveness of domestic tourism show rather a weak significance. However, there seems to be somewhat like a mutual openness to tourism as countries which are able to attract high inbound tourism receipts per capita having high outbound tourism expenditures per capita as well. A further important finding is that people in democratic countries with a high level of civil rights and good political stability spend a higher share of income for traveling abroad. Additionally, good information possibilities in the country of origin encourage foreign travel. These results support the idea that there are also important factors in the country of origin promoting foreign tourism besides the expected impact

of the per capita income. Nevertheless, our results on tourism expenditures per GDP shows that it makes sense for developing countries to sustainable invest in the tourism sector as an increasing willingness to pay for outbound tourism goes hand in hand with an increasing per capita income in the world.

4 Cultural Effects on Inbound Tourism into the USA: A Gravity Approach

4.1 Introduction

As tourism may be a relevant factor for development (see chapter 5), an important question to answer is which determinants can push demand and supply respectively for tourism in the countries of origin as well destination. In the foregoing sections of this thesis, it is shown that there are differences in tourism flows within the world that cannot be explained with economic factors exclusively. Consequently, in chapter 4 we try to analyze which joint determinants influenced the huge differences in the tourism flows of international travel between countries with emphasis on non-economic factors. In chapter 2 (supply side) and chapter 3 (demand side) we examine these effects in separate models on worldwide scale. In this chapter we combine both approaches in one model. Though, the main focus of our analysis is on the push factors (or the demand-side) of international outbound tourism, the pull factors are also considered. Technically, we do this by using an gravity approach to analyse the tourism flows on country-to-country base.

Although, the demand for international tourism is influenced by many factors, nearly all foregoing tourism demand studies concentrates on economic determinants, primarily income, in estimating fluctuations within tourism (Lim 1997a, 1997b; Zhang and Jensen 2007). In this examination, focus is on the explaining variables besides the expected influence of per capita income when one neglect the great impact of the attractiveness of the potential country of destination by observing only one (dominant) destination country. Our question is, which impacts do socio-economic factors have in the country of origin in the decision making process of traveling abroad.

Like in several sectors of consumer demand, attitudes, believes and the political environment may also influence the tourism demand. The aim of this paper is to analyze the impact of cultural, especially religious and political factors, because they cover a strong common cultural background, on tourism flows from all countries into

the USA. Although, some literature about religion and economic well-being (e.g. Heath et al. 1995) exists, papers dealing with the impact of religious believe on travel decisions are currently lacking. So, Vukonic (1996) pictures in his book the interaction between "Tourism and Religion". Even though this is the first book that starts identifying the interdependency between tourism and religion, it consists primarily of the authors' observations and reflections rather than objective statistical descriptions. Furthermore, Vukonic (1996) discusses the topic how religion can influence tourism primarily with – particularly Catholic – pilgrimages and not on broader scales. Also in Hindu societies, pilgrimages play an important role in explaining travel movements (Singh 2004). Cohen (2003) focuses more on the differences between religious travel and "normal" tourism when analyzing the reasons why American Jewish students come to study in Israel. His main result is that students who are interested in the Jewish religion (and that's why decide to study in Israel) are not interested in Israel's heritage sites; while those who come primarily as tourists to see the country and meet its residents are often not very religious. One can interpret this finding as a hint that religion is not the main reason for destination decisions of tourists. Running also a case study in Israel, Poria et al. (2003) came to different results. In their study tourists' visitation patterns to the Wailing Wall in Israel a heritage site of religious significance, were explored. The results indicate that tourists' visitation patterns are linked to tourists' religion and their strength of religious belief *per se*; but indeed it is the culture in which participants live which constructs the meaning tourists' associates with the site. In the first instance, this provides relevant information for the tourist management of heritage sites. Thus, it also supports our argument, that religion is a suitable indicator for the cultural proximity of societies. Mattila et al. (2001) investigate the influence of religion on tourism a complete other angle of view. They examine the impact of religion (and gender) on the behavior of college students during spring break holidays. Results indicate that Non-Catholic Christians (Protestants) have the lowest potential engaging in health-risk behavior (like excessive drinking) which is mostly an integral part of spring break holidays. This can explain the differences in these special kind of tourism flows within the USA.

Instead of undertaking case studies on specific religious influences on the tourism environment of sites or regions, we run a global panel estimation to get a more general insight into this relationship. Chapter 4 is organized as follows. While section

4.2 describes the model in detail, section 4.3 presents the data. The results will be discussed in section 4.4. Finally, section 4.5 concludes this chapter.

4.2 The Model

In this paper, we estimate the impact of socio-geographical factors in the country of origin on tourism by using a gravity model. Founded by Newton, gravitation is the physical force that increases with mass and decreases with distance. In physics, the gravitation force F_{ij} between two bodies is given by:

(1) $$F_{ij} = G\frac{m_i m_j}{r_{ij}} \quad ,$$

where G is the gravitational constant ($G = 6{,}674\ 28\ (\pm 0{,}00067)\ 10^{-11}\ \ {}^{\mathrm{m}^3}\!/_{\mathrm{kg\ s}^2}$), m_i is the mass of body i, m_j is the mass of body j and $d_{i,j}$ is the distance between i and j. In economics, gravity models have a long established history in the analysis of flow data, not least because of their strong empirical success in explaining international trade. In general, such models treat trade flows between two countries as being direct proportional to the product of their economic size (usually expressed as the absolute GDP) and inversely on the distance between them. The commonly used form of the model, developed independently by Tinbergen (1962) and Pöyhönen (1963), in international trade is:

(2) $$TX_{ij} = \beta_0 (Y_i)^{\beta_1} (Y_j)^{\beta_2} (D_{ij})^{\beta_3} f(A_{ij}) u_{ij}$$

where TX_{ij} is the (value) of the trade flow between country i and country j, Y_i respectively Y_j is the value of GDP in i (j), D_{ij} is the distance between (the capitals or the economic centers) of country i and j, $f\left(A_{ij}\right)$ is a function of additional variables which either promote (e.g. sharing a trade block, a common cultural background) or constrain (e.g. tariffs, adjustment costs) the flow between i and j, and u_{ij} is a log-normally distributed error term (e.g. Tomkins and Twomey 2000; Durbarry 2000; Gil-Pareja et al. 2007; Serrano 2007). Durbarry (2000) and Gil-Pareja et al. (2007) conclude that with the exception of for instance Linneman (1966) or

Bergstrand (1985), the equations estimated in the empirical literature have been ad hoc specifications. Although, the first gravity models of trade come without a theoretical foundation, this has changed. Linneman (1966), Anderson (1979), Bergstrand (1985, 1989, 1990) and Helpman and Krugman (1985) assert that the gravity equation is a reduced form of a general equilibrium model in which countries' income represents the productive capacity of the exporter (supply side) and the absorptive capacity of the importer (demand side), and distance approximates transport costs (e.g. Song and Witt 2000; Naude and Saayman 2005). It was a fundamental finding as Bergstrand (1985) demonstrates that in a realistic assumption without a perfect international substitutability of goods in production and consumption, the gravity equation usually estimated omits some relevant price variables, implying a serious misspecification of the model. According to Eilât and Einav (2004) and Gil-Pareja et al. (2007), we therefore include the PPP conversion factor as a measure of the relative cost of living in the destination, with respect to the origin country. So we can take into account the variation in prices between the countries as well as the variation in real exchange rates over time. In addition to international trade flows, the gravity equation has also been applied to a range of ''social interactions'' such as migration, regional studies or foreign direct investment. The gravity model has also been applied in the field of tourism. The general specification form of the gravity model for econometric estimation (see e.g. Mátyás 1998; Durbarry 2000; Eilât and Einav 2004; or Gil-Pareja et al. 2007) takes the following form[28]:

$$\ln TA_{ijt} = \alpha_i + \lambda_j + \delta_t + \beta_1 \ln Y_{it} + \beta_2 \ln Y_{jt} + \beta_3 \ln D_{ij} + \beta_{ijt} A_{ijt} + u_{ijt}, \quad (3)$$

where TA as dependent variable is the absolute amount of tourists traveling from country i to country j in the year t; Y_{it} is the absolute GDP in the country of origin i in year t and Y_{jt} is the absolute GDP in the country of destination j in year t; D_{ij} is the geographical distance between (the capital of) country i and country j; and A_{ijt} are additional explanatory variables with variation in all three dimensions i, j and t. A_{ijt} is given as logarithmized variable, except for dummy variables. The variables α_i,

[28] As in all studies stated above, we solve the equation (2) by expressing the variables in natural logarithm.

λ_j and δ_t represents the country (country of origin i and country of destination j), respectively the time fixed effects as well as u_{ijt} represents the white noise disturbance term.

Including a set of dummies and time invariant variables (above all for the distance between the two countries) in our gravity model, country fixed effects panel estimation cannot be applied. In addition, the variable Y_{jt} (GDP of destination country) is cross-time fix, as we use the USA as the only country of destination (see section 4.3), so that we also cannot use period fixed effects. This is also not required, regarding the short time range of five years. Thus, we use a pooled panel least square estimation model, which however allows an increase in degrees of freedom and better estimators' large sample properties than an OLS estimation model (Sequeira and Campos 2005; see also Heath et al. 1995). A widely described problem in pooled panel estimations, with respect to fixed effects estimations, is the problem of omit variables (e.g. Cheng and Wall 2005). However, because of the structure of the gravity approach, we *must* include country (and time) constant variables and that is why we use pooled panel estimation. Yet, as shown in section 4.4 the adjusted R-square in all estimations is comparatively high (with values of around 0.8); so that the dependent variable is described nearly complete by our explanatory variables; and the problem of omit third can be rejected. Furthermore, there should not be hidden endogeneity between the explanatory variables in our regression, as we use predominantly geographical variables which are strictly exogenous.[29] Another problem with fixed effects models is, according to Cheng and Wall (2005, pp. 54) that '*It is in this sense that fixed-effects modeling is a result of ignorance: We do not have a good idea which variables are responsible for the heterogeneity bias, so we simply allow each trading pair to have its own dummy variable.'* As it is our intent to explain the heterogeneity in tourism demand within the world with exogenous socio-geographic variables, we cannot apply this ignorance. Instead, according to Wei and Frankel (1997), we endeavor to estimate the exact effects of geographical variables that are constant over the sample period. The inclusion of country dummies will undermine these efforts, because the time-constant geographical variables are hidden from analysis in that case as they are subsumed

[29] The religion or language could be country GDP demanded, but this counts only in the very long run.

into the fixed effects. Nevertheless, we run an additional random effects model in a sensitivity analysis, supporting the findings of the pooled panel estimation.

4.3 The Data

Due to data availability, we use the USA as the only country of destination in our gravity analysis. For the USA the World Tourism Organization (2007a) provides the most comprehensive country to country tourism flow data, not least because of the relative strict and comprehensive border control for security reasons since September 11, 2001. Furthermore, the USA is the worlds top tourism destination measured by absolute tourism receipts (number three in the world considering absolute number of tourism arrivals; see World Tourism Organization 2006), and cover nearly all types of tourism, because of its geographical dimension, natural und cultural richness and good infrastructure. For the USA, tourism is the major export and import service; with, in contrast to the US balance on merchandises trade, a mostly positive balance on tourism (Vogt 2008). With 208 countries of origin[30], one country of destination and a time period of 5 years (2001-2005) our regression analysis contains 1040 independent observations per variable.

This paper concentrates on the determinants of inbound tourism arrivals into the USA. The dependent variable in this study is – like in the most tourism analyses (Song and Li 2008)[31] – flows of inbound tourism arrivals from 2001 till 2005, as reported by the World Tourism Organization (2007a) for 208 countries. Of course, flows of tourism expenditures (respectively receipts) may be slightly superior to flows of tourism arrivals, as these flows do not control for either the length or the spending intensity (actual value consumed) of the tourist stay at the individual destination. However, wide ranged country to country (country to USA in our case) data of tourism expenditures as well as of receipts are insufficiently available at present to undertake estimations for a large panel of countries, and about all, they are often considered highly inaccurate (Zhang and Jensen 2007). For our study it is, according to Eilât and Einav (2004) and Zhang and Jensen (2007) necessary to accept that

[30] For a list see Appendix 1-A.

[31] Also, Crouch (1994d) indicates that of the 85 tourism studies he reviewed, 63 per cent chose tourists arrivals as the measure of demand.

data on flows measured as tourism arrivals is in some aspects less valid as it only weakly quantifies what should be measured, but in other aspects a more valid indicator as it quite accurately measures tourism flows than receipts.

The most important exogenous variables are the value of absolute GDP (purchasing power parity) from 2001 till 2005 (IMF 2007) ($\ln GDP_{it}$ and $\ln GDP_{USA,t}$) and the distance between the capitals of the countries of origin and Washington, D.C. ($\ln DIST_{i,USA}$), which is measured via Google Earth. Other exogenous socio-economic and geographic variables are the following:

- the PPP conversion factor as a measure of the relative cost of living ($\ln PRICE_{i,USA,t}$) (variation in prices between the countries as well as the variation in real exchange rates) in the country of destination with respect to the origin one; source is IMF (2007) and Heston et al. (2006),
- the distance of the country of origin to the equator in degree of latitude ($\ln EQTR_i$) as a proxy for climate differences in the country of origin which may influence the decision of the destination, source is CIA (2007),
- the country area in square km ($\ln SIZE_i$) as an additional expression (besides GDP) of mass of the gravity model (according to Kimura and Lee 2006), source is CIA (2007),
- a dummy for national land borders ($BORD_i$) to the USA, as Canada and Mexico have a high border traffic with the USA,
- a dummy whether the country of origin is an island ($ISLAND_i$), as proxy for geographic insularity, source is CIA (2007)
- a dummy whether the country of origin is participant of the US Visa Waiver Program, which admit citizens of 27 countries traveling into the USA without a visa ($NOVISA_{it}$). Additionally we add Mexico, Canada and Bermuda as they have similar privileges to alleviate travel to the USA, and Puerto Rico, Guam and the US Virgin Islands as they are part of the United States. We use this as proxy for lesser travel formalities, source is US Department of State (2007),
- the World Bank governance indicators for control of corruption ($\ln CCOR_i$), government effectiveness ($\ln GOVEF_i$), political stability ($\ln POLST_i$), regulatory quality ($\ln REGQUA_i$), rule of law ($\ln LAW_i$) and voice and accountability

($\ln VOICE_i$); all as proxy for the safety of a destination. We use the mean of 2000, 2002 and 2004 as time constant variable for three reasons: First, this indicator is not available for the years 2001, 2003 and 2005; second institutions show a relatively high stability over the five years of interest and third this indicator is normalized at mean zero and a standard deviation of 2.5 for all countries each year (Kaufmann et al. 1999), so time series estimations are impossible. In addition, to allow logarithm we step up the indicator to mean 2.5 with no negative observations. Source is Kaufmann et al. (2006).

As proxy for the variables of particular interest to us, namely the cultural proximity between country of origin and country of destination, we rely (according to the trade model of Heath et al. 1995) on the religious domination of a country because religion covers (beside the belief in God) a strong common cultural background. Additionally, we use a variable for a common language. In particular we apply:

- a dummy if more than the half of the population speaks English or English is the official language ($ENGL_i$), source is CIA (2007),
- and finally the religion preferences as dummy variables for countries where more than 60 per cent are Muslim ($RL-MUSL_i$), Christian ($RL-CHRS_i$) (in some regressions the dummy Christians will be divided in Protestants ($RL-CHPR_i$), Catholic ($RL-CHCA_i$), Orthodox ($RL-CHOR_i$) or strong Christian fragmentation/ separation ($RL-CHSP_i$) as described below) or Others (Buddhist, Hindu, Shinto, Jewish etc.) ($RL-OTHR_i$). We add a further dummy for a strong religious fragmentation and competition ($RL-CONFL_i$) (at least two religions with a membership of 20 per cent in relation to the population of a country), source is CIA (2007).

The descriptive statistics referring to all non dummy variables are reported in table 4-1.

Table 4-1: Descriptive Statistics Chapter 4

	MIN	MAX	Mean	Median	Std-dev.	N
$\ln GDP_{it}$	-1.609	9.420	3.520	3.364	2.148	885
$\ln GDP_{USA,t}$	9.211	9.420	9.306	9.294	0.076	1040
$\ln DIST_{i,USA}$	6.593	9.676	8.950	9.054	0.555	1035
$\ln PRICE_{i,USA,t}$	-2.251	2.376	0.861	0.907	0.626	894
$\ln SIZE_{i}$	0.668	16.653	10.974	11.616	2.940	1030
$\ln EQTR_{i}$	-1.478	4.162	2.899	2.952	0.949	950

Source: Own estimations.

In order to detect possible endogenity, we applied a correlation matrix of the main explanatory variables (see table 4-2). However, no strong endogenity can be detected.

Table 4-2: Correlation Matrix Chapter 4

	$\ln GDP_{it}$	$\ln GDP_{USA,t}$	$\ln DIST_{i,USA}$	$\ln PRICE_{i,USA}$	$\ln SIZE_{i}$	$\ln EQTR_{i}$
$\ln GDP_{it}$	1.000					
$\ln GDP_{USA,t}$	0.039	1.000				
$\ln DIST_{i,USA}$	-0.013	3.52E-18	1.000			
$\ln PRICE_{i,USA,t}$	-0.236	-0.121	0.302	1.000		
$\ln SIZE_{i}$	0.636	-2.32E-17	0.077	0.172	1.000	
$\ln EQTR_{i}$	0.318	4.81E-19	-0.134	-0.272	0.076	1.000

Source: Own estimations.

4.4 Empirical Results

We seek to determine the drivers which are influence the amount of inbound tourism arrivals[32] of 208 countries into the USA between the year 2001 and 2005, as it is reported by the World Tourism Organization (2007a). As described above, in our first regression we add further variables of interest, besides the in gravity models necessarily required variables absolute GDP in the countries of origin (expected sign positive) and the country of destination (expected sign negative), as well as the distance between these countries (expected sign negative).

First of all, we use the PPP conversion factor as a measure of the relative cost of living in the country of destination with respect to the country of origin ($\ln PRICE_{i,USA,t}$). With the USA as only country of destination, this variable shows the relative distance in the purchasing power of the country of origin and the USA. We expect a negative sign, as high (relative-) prices in the country of destination deter people from traveling into this country. According to the trade gravity model of Kimura and Lee (2006), we add the country area ($\ln SIZE_i$) as an additional expression (besides GDP) of mass to the gravity model. We claim, because of the better availability of domestic tourism, that people in bigger countries travel lesser outside than people in smaller countries. We do not include population size as this variable is highly correlated with country area ($corr(pop, size) = 0.81$) as well as with the absolute country GDP ($corr(pop, gdp) = 0.85$). Furthermore, the country's distance to the equator in degree of latitude ($\ln EQTR_j$) as proxy for climate in the host country (no sign expected), is included in our estimation.

The other geographical variables are expressed as binary dummy variables, which take the value of one if the case is given otherwise zero: For national land borders ($BORD_j$) we expect a positive sign, as land borders reduce transportation costs. As in the most trade models (e.g. Gil-Pareja et al. 2007), we expect a negative sign for the island-dummy (takes a value of one if the country of origin is an island) ($ISLAND_i$), as insularity increases transportation costs. The dummy for participant

[32] The Word Tourism Organisation counts the tourism arrivals exclusively for leisure (not business) travel.

countries of the US visa waiver program ($NOVISA_{it}$), that alleviate travel formalities, should indicate a positive relation. Finally within this framework, we study the impact of cultural variables on tourism by including a dummy whether more than the half of the population speaks English, or English is the official language ($ENGL_i$) in the origin countries (expected sign positive, because of the better communication possibilities), and a dummy for each religion (no sign expected) respectively religion conflict (negative).

For a test of these variables, we fist apply the following pooled panel least square estimation:

M1

$$\begin{aligned}\ln TA_{i,USA,t} &= \beta_0 + \beta_1 \ln GDP_{it} + \beta_2 \ln GDP_{USA,t} + \beta_3 \ln DIST_{i,USA} \\ &+ \beta_4 \ln PRICE_{i,USA,t} + \beta_5 \ln SIZE_i + \beta_6 \ln EQTR_i + \beta_7 NOVISA_{i,t} \\ &+ \beta_8 BORD_i + \beta_9 ISLAND_i + \beta_{10} ENGL_i + \beta_{11} RL-MUSL_i \\ &+ \beta_{12} RL-CHRS_i + \beta_{13} RL-OTHR_i + \beta_{14} RL-CONFL_i + u_{i,USA,t}\end{aligned}$$

In a second estimation, we omit the insignificant variable distance to equator to raise the number of observations. In the third and fourth (again without distance to equator) estimation, we run model 2), in which the Christian dummy is subdivided into Catholic, Protestant, Orthodox or a strong Christian fragmentation between this religious denominations.

M2

$$\begin{aligned}\ln TA_{i,USA,t} &= \beta_0 + \beta_1 \ln GDP_{it} + \beta_2 \ln GDP_{USA,t} + \beta_3 \ln DIST_{USA,i} \\ &+ \beta_4 \ln PRICE_{i,USA,t} + \beta_5 \ln SIZE_i + \beta_6 \ln EQTR_i + \beta_7 NOVISA_{i,t} \\ &+ \beta_8 BORD_i + \beta_9 ISLAND_i + \beta_{10} ENGL_i + \beta_{11} RL-MUSL_i \\ &+ \beta_{12} RL-CHPR_i + \beta_{13} RL-CHCA_i + \beta_{14} RL-CHOR_i \\ &+ \beta_{15} RL-CHSP_i + \beta_{16} RL-OTHR_i + \beta_{17} RL-CONFL_i + u_{i,USA,t}\end{aligned}$$

Table 4-3: Absolute Amount of Tourism Arrivals in the USA *(continued next page)*

	I	II	III	IV
$CONSTANT$	38.573***	39.071***	37.716***	38.296***
	(7.084)	*(7.355)*	*(7.059)*	*(7.328)*
$\ln GDP_{it}$	0.961***	0.960***	0.966***	0.965***
	(26.861)	*(27.883)*	*(25.0806)*	*(26.493)*
$\ln GDP_{USA,t}$	-2.468***	-2.502***	-2.476***	-2.502***
	(-2.468)	*(-4.435)*	*(-4.377)*	*(-4.512)*
$\ln DIST_{i,USA}$	-0.954***	-0.974***	-0.894***	-0.919***
	(-10.613)	*(-11.215)*	*(-10.026)*	*(-10.678)*
$\ln PRICE_{i,USA,t}$	-1.016***	-1.072***	-0.996***	-1.052***
	(-9.844)	*(-10.562)*	*(-9.680)*	*(-10.371)*
$\ln SIZE_i$	-0.093***	-0.093***	-0.085***	-0.084***
	(-3.045)	*(-3.123)*	*(-2.700)*	*(-2.694)*
$\ln EQTR_i$	0.022		0.071	
	(0.433)		*(1.356)*	
$NOVISA_{it}$	-0.851***	-0.540***	-0.756***	-0.664***
	(-4.951)	*(-3.305)*	*(-4.420)*	*(-4.017)*
$BORD_i$	1.552***	1.256***	1.173***	1.188***
	(3.878)	*(3.099)*	*(2.949)*	*(2.965)*
$ISLAND_i$	0.395***	0.363***	0.237*	0.319**
	(3.113)	*(2.797)*	*(1.809)*	*(2.454)*
$ENGL_i$	0.802***	0.872***	0.788***	0.848***
	(6.977)	*(7.803)*	*(6.675)*	*(7.324)*
$RL-MUSL_i$	-0.349*	-0.292	-0.259	-0.176
	(-1.695)	*(-1.476)*	*(-1.270)*	(-0.899)
$RL-CHRS_i$	1.090***	1.025***		
	(5.317)	*(5.219)*		
$RL-CHPR_i$			1.566***	1.558***
			(5.885)	*(5.985)*
$RL-CHCA_i$			1.453***	1.414***
			(6.630)	*(6.694)*
$RL-CHOR_i$			0.310	0.438*
			(1.195)	*(1.839)*

	I	II	III	IV
$RL-CHSP_i$			1.167***	1.055***
			(5.378)	*(4.991)*
$RL-OTHR_i$	0.839***	0.917***	0.895***	0.992***
	(3.676)	*(4.059)*	*(3.962)*	*(4.428)*
$RL-CONFL_i$	-0.098	-0.047	0.018	0.079
	(-0.736)	*(-0.364)*	*(0.889)*	*(0.619)*
R^2adj	0.7817	0.7738	0.7900	0.7815
N	803	858	803	858

Dependent variable is the absolute amount of Tourism Arrivals 2001 – 2005.
Absolute t-values in parenthesis.
* Significant at the 90 percent level.
** Significant at the 95 percent level.
*** Significant at the 99 percent level.

The results in table 4-3 do indeed support most of our expectations. The model fits the data very well by explaining almost 80 per cent of the variation of tourist flows. Generally spoken, one can explain tourism flows in this gravity model with a high significance and goodness of fit. Also most of the estimated variables are in general statistically significant, with interesting interpretations. The gravity variables of mass and distance show the expected sign: Tourism flows into the USA increases with the GDP of the country of origin (with a very high t-value of more than 26), while the absolute GDP in the host country and the distance between both countries causes the opposite. More interestingly for our analysis are the additional variables. The relative cost of living in the country of destination with respect to the country of origin ($\ln PRICE_{i,USA,t}$) or in other words, the relative 'distance' in the purchasing power of the country of origin and the USA plays apparently a major role in the decision-making process of international travelers, as it affects tourism flows negatively. While distance to equator is not significant, the variables size (the larger a country is, the less attractive is it for inhabitants to travel outside), the dummy for land border (most people prefer short and cheap ways to their holiday destination) and the dummy for English as main language (besides the better communication possibilities, this is an expression of the preferred cultural proximity) influences the tourism arrivals into the USA, as proposed. Two variables show a significant unexpected sign, the island dummy and the dummy for participants of the US Visa Waiver Program. We reason that, opposed the most other gravity models of international trade, being an island as

origin country is not negative for outbound tourism, as tourists are interested in other natural experiences. While islands for the most tourists are preferred destinations (see Freytag and Vietze 2009), tourists *from* island-countries obviously favor the widespread landscape of the United States. The negative impact of the Visa Waiver Program (VWP) is astonishing. We guess, that is because our other explanatory variables have a stronger impact on tourism flows; especially the dummies for religion, English language and land border. In the most instances, these countries are also participants of the VWP. A second possible reason could be the small size of the most VWP-countries (e.g. Liechtenstein, Luxembourg, Andorra, Austria, Singapore) which come along with low tourism departures and therefore can cause a negative impact in our analysis. The religion dummies – the parameters of special interest because they cover also a common cultural background – give us the hint that cultural factors play an important role in the decision to travel into a country or not. While people from Christian and other non Muslim or Christian countries (Buddhist, Hindu, Shinto, Jews etc. that cover important "western-oriented" countries of origin like China, India, Japan and Israel)[33] prefer the USA as holiday destination, people from Muslim countries do not.[34] A division of the Christian countries into several confessions did not add much additional explanation power to our model, albeit one can see that people from Orthodox countries (mainly Eastern Europe countries) demand lower outbound tourism into the USA. Together with the strong positive impact of the English language this heightened our impression, that for the majority of tourists the destination choice for a holiday country is rather driven by the demand for cultural similarity to the home country, than by the desire to experience quite different other cultures. Presumably, this shows the people's inherent fear of the new and the other.

In the following, we analyze whether this finding is also statable for governmental indicators which indicate civil and political rights. Here, we test the interaction of a same political background more directly. We use the World Bank governance indicators as proxy for institutions. We claim that good institutions in the country of origin have a positive impact on the absolute amount of US tourism arrivals from the respective country, as freedom to travel is a part of political freedom. We do not use

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[33] Moreover, these countries have a significant Diaspora in the United States.

[34] It may be possible that this is also a result of the stronger US entry requirements for people of Muslim countries since September 2001.

$\ln CCOR_i$, $\ln GOVEF_i$, $\ln LAW_i$, $\ln POLST_i$, $\ln REGQUA_i$ and $\ln VOICE_i$ simultaneous in the same estimation, because they are highly correlated. While these government indicators are also highly correlated with GDP per capita (see also Freytag and Vietze 2009, 2010 and Vietze 2009), this does not count for the correlation with the current used variable absolute GDP. That is why we can not use these estimators together in the following model:

M3

$$\begin{aligned}\ln TA_{i,USA,t} &= \beta_0 + \beta_1 \ln GDP_{i,t} + \beta_2 \ln GDP_{USA,t} + \beta_3 \ln DIST_{i,USA} \\ &+ \beta_4 \ln PRICE_{i,USA,t} + \beta_5 \ln SIZE_i + \beta_6 \ln EQTR_i + \beta_7 NOVISA_{i,t} \\ &+ \beta_8 BORD_i + \beta_9 ISLAND_i + \beta_{10} ENGL_i + \beta_{11} RL-MUSL_i + \beta_{12} RL-CHRS_i \\ &+ \beta_{13} RL-OTHR_i + \beta_{14} RL-CONFL_i + \beta_{15} \ln CCOR_i + \beta_{16} \ln GOVEF_i \\ &+ \beta_{17} \ln LAW_i + \beta_{18} \ln POLST_i + \beta_{19} \ln REGQUA_i + \beta_{20} \ln VOICE_i + u_{i,USA,t}\end{aligned}$$

Table 4-4: Institutions and Tourism Arrivals in the USA *(continued next page)*

	I	II	III	IV	V	VI
$CONSTANT$	34.689***	34.410***	34.330***	33.474***	32.986***	34.526***
	(6.588)	*(6.556)*	*(6.545)*	*(6.394)*	*(6.500)*	*(6.743)*
$\ln GDP_{it}$	0.922***	0.886***	0.912***	0.950***	0.884***	0.925***
	(26.856)	*(24.887)*	*(26.305)*	*(27.675)*	*(26.254)*	*(27.827)*
$\ln GDP_{USA,t}$	-2.171***	-2.130***	-2.115***	-2.005***	-2.088***	-2.199***
	(-3.899)	*(-3.835)*	*(-3.814)*	*(-3.625)*	*(-3.892)*	*(-4.056)*
$\ln DIST_{i,USA}$	-1.024***	-1.028***	-1.054***	-1.009***	-0.934***	-0.972***
	(-12.021)	*(-12.111)*	*(-12.352)*	*(-11.512)*	*(-11.304)*	*(-10.912)*
$\ln PRICE_{i,USA,t}$	-0.755***	-0.761***	*-0.724****	-0.745***	-0.741***	-0.810***
	(-6.892)	*(-7.064)*	*(-6.513)*	*(-7.224)*	*(-7.324)*	*(-7.952)*
$\ln SIZE_i$	-0.031	-0.024	-0.022	-0.050*	-0.010	-0.057*
	(-1.025)	*(-0.789)*	*(-0.704)*	*(-1.661)*	*(0.353)*	*(-1.962)*
$NOVISA_{it}$	-0.851***	-0.777***	-0.786***	-0.458***	-0.700***	-0.645***
	(-4.951)	*(-4.667)*	*(-4.735)*	*(-2.960)*	*(-4.481)*	*(-4.108)*
$BORD_i$	1.552***	1.513***	1.433***	1.216***	1.221***	1.229***
	(3.878)	*(3.806)*	*(3.614)*	*(3.240)*	*(3.186*	*(3.162)*
$ISLAND_i$	0.395***	0.390***	0.404***	0.439***	0.432***	0.243*
	(3.113)	*(3.080)*	*(3.192)*	*(3.349)*	*(3.515)*	*(1.937)*
$ENGL_i$	0.749***	0.726***	0.772***	0.693***	0.779***	0.817***
	(6.774)	*(6.564)*	*(7.026)*	*(6.049)*	*(7.339)*	*(7.607)*
$RL-MUSL_i$	-0.216	-0.274	-0.235	-0.023	-0.272	-0.220
	(-1.114)	*(-1.419)*	*(-1.215)*	*(-0.121)*	*(-1.453)*	*(-1.158)*
$RL-CHRS_i$	1.023***	0.974***	1.011***	1.174***	0.851***	0.642***

	I	II	III	IV	V	VI
	(5.327)	*(5.080)*	*(5.280)*	*(6.363)*	*(4.554)*	*(3.317)*
$RL-OTHR_i$	0.840***	0.778***	0.806***	0.981***	0.738***	0.789***
	(3.788)	*(3.505)*	*(3.645)*	*(4.666)*	*(3.441)*	*(3.637)*
$RL-CONFL_i$	-0.050	-0.047	0.100	0.084	-0.016	-0.023
	(-0.396)	*(-0.377)*	*(0.791)*	*(0.669)*	*(-0.136)*	*(-0.191)*
$\ln CCOR_i$	1.067***					
	(6.020)					
$\ln GOVEF_i$		1.104***				
		(6.461)				
$\ln LAW_i$			1.087***			
			(6.219)			
$\ln POLST_i$				0.458***		
				(5.637)		
$\ln REGQUA_i$					1.126***	
					(9.661)	
$\ln VOICE_i$						1.119***
						(8.659)
R^2adj	0.7865	0.7879	0.7865	0.7868	0.7990	0.7921
N	848	848	853	767	853	858

Dependent variable is the absolute amount of Tourism Arrivals 2001 – 2005.
Absolute t-values in parenthesis.
* Significant at the 90 percent level.
** Significant at the 95 percent level.
*** Significant at the 99 percent level.

The interpretation of table 4-4 is fairly simple, as it confirms our expectations. The existence of good institutions in the countries of origin seems to have a positive impact on the absolute amount of US tourism arrivals. People in countries with a high level of civil rights, stable and effective governance, less but sensible regulation, low corruption and a high level of freedom to speak decide to travel more into the USA than such with bad institutions. First, one can see that the demand to travel abroad is directly affected by a high level of civil rights and political freedom. In other words, freedom of travel is an immediate outcome of political freedom. Second, as the USA have very high governmental rankings, this circumstantiates our argument above that people deciding go to holiday in countries with a similar cultural and political background.[35]

[35] Of course, there may be common causes like the countries GDP per capita, since good institutions often causes high GDP per capita in the respective country.

Sensitivity Analysis

In a sensitivity analysis (see table 4-5), we run an additional random effects model. Our aim is to prove, if the findings of the estimations above hold stable a chance of the estimation model. As described in section 4.2, we cannot use a cross section (or cross period) fixed effects model. That is why we use our principal estimation Model 1 (including distance to equator) with cross section random effects. We run also Model 2 and Model 3 with the same outcome as in Model 1, but forgo printing this results as the additional variables of interest (confession dummies in Model 2 and institution dummies in Model 3) show the same – significant – sign, as in the pooled panel model.

Table 4-5: Sensitivity Analysis

	I (Pooled Panel)	II (Random Effects Model)
$CONSTANT$	38.573***	32.051***
	(7.084)	*(2.527)*
$\ln GDP_{it}$	0.961***	0.919***
	(26.861)	*(12.413)*
$\ln GDP_{USA,t}$	-2.468***	-1.757***
	(-2.468)	*-11.601*
$\ln DIST_{i,USA}$	-0.954***	-1.089***
	(-10.613)	*(-5.418)*
$\ln PRICE_{i,USA,t}$	-1.016***	-0.255***
	(-9.844)	*(-3.375)*
$\ln SIZE_i$	-0.093***	-0.095
	(-3.045)	*(-1.475)*
$\ln EQTR_i$	0.022	0.078
	(0.433)	*(0.690)*
$NOVISA_{it}$	-0.851***	0.187
	(-4.951)	*(0.547)*
$BORD_i$	1.552***	1.065
	(3.878)	*(1.163)*
$ISLAND_i$	0.395***	0.307
	(3.113)	*(1.052)*
$ENGL_i$	0.802***	0.817***
	(6.977)	*(3.154)*
$RL-MUSL_i$	-0.349*	-0.052
	(-1.695)	*-0.114*
$RL-CHRS_i$	1.090***	1.412***
	(5.317)	*(3.114)*
$RL-OTHR_i$	0.839***	1.085**
	(3.676)	*(2.137)*
$RL-CONFL_i$	-0.098	*0.036*
	(-0.736)	*(0.120)*
R^2adj	0.7817	-
wght. R^2adj	-	0.4047
random effects	-	x
N	803	803

Dependent variable is the absolute amount of Tourism Arrivals 2001 – 2005.
Absolute t-values in parenthesis.
* Significant at the 90 percent level.
** Significant at the 95 percent level.
*** Significant at the 99 percent level.

The results above support the strength of our findings. Except of the dummy for the US Visa Waiver Program ($NOVISA_{it}$), which shows the opposite, but also insignificant sign, all other main variables remain, with, however, sometimes lower t-values, as in our pooled panel model. Hence, the random effects model also underpins that the amount of absolute tourism arrival into the United States will be influenced positively by the absolute GDP, English as main language and a non Muslim religion (Christian, Buddhist, Hindu, Shinto and Jewish) all in the country of origin; and will be influenced negatively by the geographical distance, the relative distance in the purchasing power between the two countries, the absolute GDP in the USA, and the size of the country of origin. This supports the findings of our preferred pooled panel model.

4.5 *Summary and Conclusions*

In this paper we discuss the effects of cultural – and particularly religious – factors on tourist flows into the USA as the world largest tourism destination. To estimate this empirically, we run an augmented gravity equation. Besides the basic variables size (countries' GDP) and distance (distance between the capitals of the countries of origin and Washington, D.C) we include a set of variables that allows us to control for other important exogenous determinants of international tourism flows (the use of a common language (English); island and border status; special visa facilities; the relative costs of living; the governance situation; etc.). Our results give evidence that the gravity equation is an excellent instrument to explain variations in international tourist flows.

Go tourists on holiday to become acquainted with foreign cultures? Rather not! So, with respect to the aim of the paper, we have found that cultural proximity between the country of origin and the country of destination have positive effects on the tourism flows between these countries. In particular, after controlling for a set of geographic variables, people from countries with the same language (English) and the same high governmental rankings like the USA, show a higher demand for traveling into the USA for holiday than people from other countries. Above all, we have clear and stable evidence that tourists coming from Christian – and here particular from Catholic and Protestant – countries, prefer the USA as holiday

destination much stronger than people from Muslim countries. As a common religion covers a strong common cultural background, these supports our argument that people wishing to go on holiday to countries with a similar cultural and political background. We think, this result is not surprising, as it shows the people's inherent fear of the new and the other.

Further research is necessary to extend the sample to learn more about other countries of destination. Nevertheless, our results give us a direct and crucial hint that culture and religion may play an important role in explaining international trade relations.

5 Can Nature Promote Development? The Role of Sustainable Tourism for Economic Growth

5.1 Introduction

After deriving insights into tourism in general, and the determinants explaining the demand and supply of this service good in particular, this last chapter is dedicated to the potential of tourism for (sustainable) economic development. As addressed in the forgoing chapters, international tourism revenues have become an important source of income also for developing countries. This trend is feeding hopes that the development process can be enhanced without taking the same route as industrialized countries, i.e. via leap-frogging. A huge literature is supporting this view. At the same time, environmentalists fear that increasing tourism destroys significant parts of the environment and reduces biodiversity in developing countries. A worsening environmental quality may be adverse to economic growth; at least in the long run. This concern has increasingly been taken into consideration in development economics. We also consider it by discussing the question of how and to what extent biodiversity can be interpreted as an input for sustainable growth.

Applying a trade based growth-model, we discuss the chance to use biodiversity as a driver of development, thereby overcoming the trade-off between economic and ecological aspects. Based on earlier work by Freytag and Vietze (2009), which shows that (1) biodiversity is constituting a comparative advantage in tourism, that (2) the degree of endangered biodiversity is negatively affecting absolute inbound tourism receipts and that (3) the degree of biodiversity is positively affecting these receipts, we analyze how these results change when we focus on tourism arrivals rather than tourism receipts. This difference may be crucial as both the data for receipts and arrivals do not distinguish between sustainable (individual) and mass tourism. However, we can assume that spending in tourism is faster responding to income increases of potential tourists than the number of arrivals, i.e. their increasing income in countries of origin does not increase the number of arrivals to the same extent as the receipts in the destination countries. Arrivals thereby rather mirror mass

tourism, where receipts can be a proxy for sustainable tourism. Hence, the latter is treated as a superior good, whereas mass tourism is not.

The remainder of this chapter is organized as follows. After a literature review about the effects of tourism on growth (section 5.2), we first theoretically and in a second step empirically analyze how tourism can affect economic growth via biodiversity. Cautious policy conclusions round off the paper in section 5.5.

5.2 Tourism, Environment and Economic Development: The Literature

In developing countries, international tourism may well become a relevant factor for economic development. Two conditions seem crucial for this expectation to materialize: first, this development depends on a "terms of trade effect" as long as demand (and prices) increase by a higher rate than world income. In other words, caused by a low elasticity of substitution (Lanza et al. 2003; Brau et al. 2003) tourism is beneficial for growth if the international terms of trade move in favor of tourism services. This is especially the case if tourism is a superior or luxury good, such that consumers' demand increases strongly with rising income (income elasticity of demand higher than one) (Lim 1997b; Brau et al. 2003, pp. 16; Divisekera 2003; Eilat and Einav 2004, pp. 1325). Second, to allow for sustainable growth, tourism suppliers should take notice of the environment, as it has been shown to be an important input for tourism services. Nature is a directly influencing factor for the demand for tourism, as it is discussed in a number of theoretical papers (e.g. Nijkamp 1998; Muir-Leresche and Nelson 2000; Ashley and Elliott 2003; Creaco and Querini 2003; Valente, 2005). Some empirical papers have confirmed this view (e.g. Zhang and Jensen 2005; Freytag and Vietze 2009). The latter provide empirical evidence that biodiversity[36] *per se*, i.e. the number of different species in a given situation, contributes to tourism revenues by enhancing the attractiveness of an area to

[36] Biodiversity is differentiated in the standard literature into ecological, organism and genetic diversity (Heywood 1995). Although our variable introduced below ($BIRDS$) relates to organism diversity, we would favor a more general concept of biodiversity covering the three subcategories. This is however very difficult to measure and to quantify.

tourists. This is a highly relevant outcome not only for ecological purposes but also for economic development, and further supports the view that the alleged trade-off between the economy and the environment is not a natural companion of development. As it may be assumed that developing countries are relatively rich in biodiversity, it can be an important precondition for a growing tourism industry, which then contributes to sustainable development in these countries. A rich biodiversity may provide a comparative advantage for tourism in the developing world.

On the same token, economic growth, trade and especially tourism may also have a negative impact on biodiversity (e.g. Nijkamp 1998; Berno and Bricker 2001; Neto 2003). As trade and tourism – in particular through the introduction of damaging invasive exotic species – can affect the local biodiversity negatively there may be rebound effects for a nature based tourism industry (e.g. Kanellakis 1975; McAusland and Costello 2004; Polasky et al. 2004; Freytag and Vietze 2009).[37] Thus, if it can be shown that biodiversity is beneficial for tourism and economic development, it is sensible to invest into biodiversity or create incentives to protect biodiversity.

Given that these conditions are met, tourism is likely to stimulate additional economic activity because tourists demand a number of goods and services: e.g. food, accommodation, transportation, entertainment and local handcrafts as souvenirs. Since the tourism sector is labor intensive, an increase in employment can be expected (Nijkamp 1998; Sinclair 1998; Deloitte & Touch et al. 1999; Neto 2003, pp. 4ff). Another indirect effect is that international tourism may push the political leaders in the country of destination to establish good governance, grant more civil rights or open the country for international trade. These assumed effects are particularly relevant for developing countries (DCs), which often have high rates of unemployment, “problematic” governments and difficulties to enter international trade.

Recent studies empirically investigate the effects of tourism on economic growth. Using the number of UN World Heritage sites as an instrument for tourism, Arezki et al. (2009) show positive effects of tourism on economic growth. They do not

[37] For general empirical assessments of the relation between biodiversity and economic welfare see Naidoo and Adomowicz (2001); Asufu-Adjaye (2003); Barbier and Bulte (2004); Lomborg (2004) as well as Freytag et al. (2009).

concentrate on developing countries. Differently, Brau et al. (2003) analyze if specializing in tourism is an appropriate growth strategy for DCs. They assess the relative growth performance of 14 “tourism countries” within a sample of 143 countries, observed during the period 1980-95. Using standard OLS cross-country growth regressions, they show that the tourism countries grew significantly faster than all the other sub-groups considered in their analysis (OECD, Oil, DC, small countries). Moreover, Brau et al. (2003) find that other growth factors – low base value of per capita GDP, high saving/investment propensities or high openness to trade – do not significantly contribute to the positive performance of the tourism countries, concluding that tourism specialization is an independent determinant for economic growth. Confirming this result, Eugenio-Martin et al. (2004) examine the impact of tourism on economic growth with an analysis based on a panel data approach focusing on Latin American countries between 1985 and 1998. They estimate the relationship between economic growth and an increase in the number of tourist arrivals per capita conditional on main macroeconomic variables. The findings show that the tourism sector is a driver of economic growth in medium or low-income countries, though not necessarily in developed countries (Eugenio-Martin et al. 2004, pp. 5-11). Unlike in our analysis below, none of these studies differentiates between sustainable and unsustainable tourism. Hence, they do not discuss long-run effects of tourism. Thus, even given the positive correlation between tourism and short-run growth, mass tourism may not be a growth factor in the long-run. In the following two sections we particularly discuss this problem.

5.3 Trade in Tourism and Economic Development: The Theory

Much of the recent growth literature points to the positive role the more innovative sectors plays in explaining economic growth. If considering countries in autarchy, the more innovative sector growths faster in the long-run. If trade induces different countries to specialize in sectors with different dynamic potentials, and technological spillovers across sectors and countries are not strong enough, then uneven growth will normally be obtained (Grossman and Helpman 1991; Aghion and Howitt 1998). How can policy contribute to a sustainable growth setting via tourism specialization?

To explain the ability of tourism for economic growth in detail, we use and adjust a model that is derived from a series of papers by Brau et al. (2003); Lanza et al. (2003); Lanza and Pigliaru (1994, 2000). These are based on Lucas' (1988) two sector endogenous growth model.

Consider a world formed of two small countries, country T (relative rich of biodiversity B) and country M (relative rich of human capital L). Each country is characterized by a two sector economy producing manufactures and tourism with human capital (L) as given factor of production. Only the production of tourism requires biodiversity (B) as additional input. The assumption of biodiversity being a factor of production is not standard in the literature (e.g. Brander and Taylor 1997, 1998; Hannesson 2000; Polasky et al. 2004; Smulders et al. 2004). Nevertheless, it seems highly plausible to treat biodiversity as factor rather than as product: First, tourists consume services such as recreation and sightseeing. Nature is an input to provide these services. Second, given that property rights are assigned correctly, biodiversity can be analytically treated like any given factor of production.

According to Lucas (1988), the accumulation of human capital via learning by doing is the only engine of growth. The technology to produce the M-and the T-good respectively is:

(1) $y_M = h_M L_M$

and

(2) $y_T = b h_T L_T$,

where h_i ($i = M, T$) is the level of used human capital. Human capital determines the labor productivity of the respective labor force $L_{M,T}$ allocated to the sector. While human capital – with the productivity rate h_i – will be "regenerated" (and accumulated) instantly via learning by doing, the production of tourism T requires an regenerative input, the natural resource biodiversity B with the productivity rate b

and the fixed maximum endowment of $\overline{B}$ $\left(B \leq \overline{B}\right)$.[38] It takes time to regenerate biodiversity. Yet, if a species is completely extinct it cannot be recovered (Asufu-Adjaye 2003, p. 182). As shown in equation (2), to produce tourism T each worker must be endowed with a quantity b of B. The value of b is exogenous and depends on whether property rights are assigned on biodiversity B. This has important implications for the long-run use of this factor, in particular as a market for biodiversity does not exist without political support. If property rights are not assigned correctly, the factor price of B is zero and nature will be overused. Country T then faces a typical problem of a common property. In this case it is impossible to exclude producers from the (unsustainable) utilization of biodiversity, but they compete for biodiversity B. Thus, the assignment of biodiversity property rights plays a major role for the factor price and factor use. Now, to simplify, in the next steps we assume that $b = 1$.

The potential for learning by doing in the respective sector γ_i is constant. We assume in our model that manufacturing as "high technology" is the high skilled sector, so that $\gamma_M > \gamma_T$. This assumption seems to be plausible, as the tourism sector is especially low-skill labor intensive (Nijkamp 1998; Sinclair 1998; Deloitte & Touch et al. 1999; Neto 2003).[39] While all companies in the same sector generate the same knowledge accumulation, there are no intersectoral spillovers. This assumption is in accordance with empirical findings. Moretti (2004) finds by using three alternative measures of economic distance – input/output flows, technological specialization, and patent citations – that spillovers between industries that are economically close are larger than spillovers between industries that are economically distant in terms of human capital intensity of the respective industry. This relates to our model with tourism as part of the "simple service industry" versus manufacturing as human capital intensive industry. In each period, with knowledge accumulations driven by

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[38] There is of course a natural steady decline of the number of species. But these decline rates are – first – very small and not relevant in the short-run; and matter – second – mainly for taxa like mosses, insects and molluscs and not for "tourism relevant taxa" like vascular plants, birds or mammals (Lomborg 2004, pp. 249-257). To simplify the model we assume a fixed endowment of biodiversity.

[39] By supposing tourism as high skill sector, it is also possible to construct economic growth theoretically in the standard model by Lucas (1988). However, it is our aim to show economic growth via tourism as option for (currently) low-skill labor abundant DCs.

learning by doing, increases in h_i are proportional to the sector's labour force. That means that factor movement into one sector leads to a proportional increase of human capital in the respective sector:

(3) $$\frac{\dot{h}_i}{h_i} = \gamma_i L_i .$$

The endowment of the factors biodiversity B and human capital L plays a crucial role in determining the comparative advantages of the respective country. The two goods are produced with different factor intensities. Manufactures M are produced relatively human capital L intensively, while the production of tourism T requires relative more biodiversity B. In autarky, both countries produce both goods and reach a social optimum under different factor and goods price relations. Next, assume that these countries engage in international trade.[40] While countries with low endowment of biodiversity $\overline{B}$ face a constraint in the amount of labor, they can allocate in the tourism sector T (e.g. countries with $\overline{B} < 1$ cannot allocate the whole labor force to T), countries with larger $\overline{B}$ do not. With respect to the mechanism of relative price in autarchy, countries with a larger labor force, subjected to their biodiversity endowment $L_T\left(\overline{B}\right)$, will tend to develop a comparative advantage in T. For countries with smaller $L_T\left(\overline{B}\right)$ the opposite holds. International trade will force the individuals in both countries to specialize according their comparative advantages. Thus, country T focuses on the production of tourism, while country M produces relative more manufactures. The trade implications of this model are the following: country T exports tourism services. In exchange for the consumption of tourism, the citizens of country M export manufactures.

As the production of manufactures requires only human capital L_M, international trade will force all countries to specialize completely according to their comparative advantages, so that the growth rate of a country is then:

(4) $$\frac{\dot{y}_i}{y_i} = \gamma_i .$$

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[40] To simplify we do not consider trade-induced habitat effects (e.g. Smulders et al. 2004).

Hence, as $\gamma_M > \gamma_T$, the growth rate in countries specialized in M is higher than in tourism countries.

Next, international trade also affects the *terms of trade* ($p \equiv {p_T}/{p_M}$), between the two countries. In particular, assuming that preferences are homothetic and identical everywhere, the terms of trade p move at a constant rate in favor of the slowly growing good tourism T; exactly counterbalancing the growth differential between the two countries. So, it can be expected that in the long-run the tourism country grows with the same rate as industrialized countries (in terms of model if $\sigma = 1$), with σ being the elasticity of substitution[41]. With a constant elasticity of substitution, ${\dot{p}}/{p}$ as the rate of change of the price p (p defined as $p \equiv {p_T}/{p_M}$) is equal to $\left({\dot{y}_M}/{y_M} - {\dot{y}_T}/{y_T} \right)\sigma^{-1}$.[42] With complete specialization, under consideration of (4) it follows that

(5) $$\frac{\dot{p}}{p} = \frac{\gamma_M - \gamma_T}{\sigma} > 0 ,$$

which refers to a growth rate of the tourism country of

(6) $$\frac{\dot{y}_T}{y_T} = \gamma_T + \frac{\dot{p}}{p} .$$

All equations above refer to long-run growth rates in presence of the assumed constant b. Now we consider that at a certain point in time in the tourism specialized country T not the maximum endowment of biodiversity $\bar{B}$ is used, from what follows

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41 The elasticity of substitution is definite at $\sigma = -\frac{d\left(\frac{Y_M}{Y_T}\right)}{d\left(\frac{p_T}{p_M}\right)} * \frac{\frac{p_T}{p_M}}{\frac{Y_M}{Y_T}}$. Intuitively σ explains how a consumer's relative choice over consumption items changes as their relative prices change. Or in other words, if the relative prices change at one per cent, by how many per cent changes the consumer's relative choice over consumption.

42 For an exact mathematical derivation of this equation see Lanza et al. 2003, pp. 317ff.

that $b < \bar{b}$. Thereby $\bar{b} \equiv \bar{B}/L$ is the upper bound of biodiversity per unit of labor, if country T is completely specialized in T. If the tourism sector in this country expands, the rate of utilization of its biodiversity B increases too. The short-term growth rate of the tourism economy $\dot{y}_{T_S}/y_{T_S}$ in terms of the manufacturing good M ($_S$ stands for short-term) is now

$$(7) \qquad \frac{\dot{y}_{T_S}}{y_{T_S}} = \gamma_T + \frac{\dot{p}}{p} + \frac{\dot{b}}{b}.$$

As explained more precisely below, in the long-run tourism specialization is harmful (beneficial) for growth if σ is greater (smaller) than one. Comparing with equation (5), manufacturing is the sector with higher growth rates as the elasticity of substitution is $\sigma > 1$. Nevertheless, it is possible that the country specialized in tourism T can growth faster and therefore convergence to the manufacturing country M. Which mechanisms can lead to this result?

In the long-run, the biodiversity utilization growth rate $\dot{b}/b$ approaches to zero once the upper bound of biodiversity per unit of labor $\bar{b}$ is reached. Hence, the growth rate $\dot{y}_{T_S}/y_{T_S}$ can only be observed in the short-run. If a new tourism site (or country) will be developed with unsustainable (mass-) tourism, where at the starting point in time the biodiversity B is not used, a higher short-term growth rate $\dot{y}_{T_S}/y_{T_S} > \dot{y}_M/y_M$ is possible. In that case, the rate of utilization of biodiversity ($\dot{b}/b > 0$) increases significantly during this period, from what follows that

$$(8) \qquad \frac{\dot{y}_{T_S}}{y_{T_S}} = \gamma_T + \frac{\dot{p}}{p} + \frac{\dot{b}}{b} > \frac{\dot{y}_M}{y_M} > \frac{\dot{y}_T}{y_T} = \gamma_T + \frac{\dot{p}}{p}$$

is feasible. It can be seen that the short term growth rate $\dot{y}_{T_S} / y_{T_S} = \gamma_T + \dot{p}/p + \dot{b}/b$ of the country specialized in tourism T *can* be greater than the growth rate $\dot{y}_M / y_M$ of the country which produces manufacturing goods M. Even if $\sigma > 1$ so that $\frac{\dot{p}}{p} < \gamma_M - \gamma_T$, the terms of trade effect cannot outweigh the productivity differential. With an unsustainable over-utilization of biodiversity B, this growth can only be observed in the short-run until the biodiversity utilization growth rate $\dot{b}/b$ tends to become zero when the upper bound of biodiversity per unit of labor $\bar{b}$ is reached. From this point in time t_1, an additional utilization of biodiversity B leads to an overuse of that resource. In other words: the consumption rate of biodiversity by the tourism industry is higher than the regeneration rate of biodiversity. This assumption has important implications for the long-run use of this factor, in particular as a market for biodiversity does not exist without political support. Without a positive price, there is the danger of an overuse, as biodiversity then can be treated as a common pool property. Thus, the assignment of biodiversity property rights plays a major role for the factor price and factor use.

It is an individually rational action of every tourism manager to assume that if she does not use (and thereby overuse) the biodiversity, her competitors will be doing it. Then the supply of tourism increases, factor prices tend to not be equalized, and country B experiences a loss from trade (Brander and Taylor 1998). An incremental degeneration of B, which involves a decrease of the comparative advantage for tourism T in country T, is the reason for this development. Thus, over time this results – because of a decrease of the natural endowment of biodiversity $\bar{B}$ (and therefore a lower biodiversity productivity rate $b < \bar{b}$) – in a lower GDP-growth rate in country T than in country M ($\dot{y}_{T_S} / y_{T_S} \leq \dot{y}_M / y_M$).

By contrast, the long-term interpretation considers the property rights on biodiversity B assigned appropriately in the tourism specialized country. It relies on a terms of trade effect. In other words, tourism is beneficial for growth if the international terms

of trade (p_T / p_M in case of country T) move in favor of tourism services. Essentially, tourism is beneficial for growth if the international terms of trade move fast enough to more than offset the gap in sectoral productivity growth ($\gamma_M - \gamma_T$) so that $\frac{\dot{p}}{p} > \gamma_M - \gamma_T$ and the terms of trade effect can outweigh the productivity differential. From equation (5) follows that this is the case if $\frac{\dot{p}}{p} = \frac{\gamma_M - \gamma_T}{\sigma} > (\gamma_M - \gamma_T)$, so that $\sigma < 1$ is sufficient for this result.

This means that if the relative price for tourism increases at one per cent, the relative demand shift from tourism to manufactures is lesser than one per cent. With goods as different as tourism and manufactures in our model, every reason is given for supposing that the elasticity of substitution will be low. This is related to a low price elasticity of demand for tourism which is evidenced by empirical findings, at least aside from mass tourism.[43] Hence, a steady increase in the relative price of tourism leads to a relative low decrease in tourism demand. So, the gains from tourism increases without (relative) demand expansion like more hotels etc.. This is the case if consumer preferences are such that tourism specialization (or some types of tourism specialization) is highly valued in the international marketplace.

Hence, there is an additional interpretation that yield further theoretical support: Specializing on tourism (under consideration of $\sigma < 1$) could be start a growth mechanism. If the manufactures sector, on which only country M is (completely) specialized, growths faster than the tourism sector in country T, an output shift to T – regarding to income effects – and with it an intensifying of the above mentioned terms of trade "improvement" can be reached. In our two-good-two-country world the output expansion of M (as exclusively produced by this country) can be interpreted as relative increase in income in this country compared to country T. If adding – empirically well supported – non-homothetic preferences to the model, tourism T is a superior or luxury good, such that consumers' demand increases strongly with

[43] Eilat and Einav (2004) empirically find that there is a low price elasticity of demand for tourism to low-GDP destinations, in which tourism are typically no mass phenomenon. Eugenio-Martin et al. (2004) find in an empirical study about the determinants of demand for tourism in Latin America that the relative price of goods and services in a destination is not relevant for the demand of tourism.

increasing income (income elasticity of demand higher than one) (Lim 1997b; Brau et al. 2003, p. 16; Divisekera 2003; Eilat and Einav 2004, p. 1325; Vietze 2009, pp. 21ff). The consequence is a second growth mechanism, namely an increase of the relative demand of tourism by increasing world GDP. Therefore, the human capital accumulation based increase of GDP in country M tends to result in a higher demand for tourism (which is produced by country T). This causes a relative increase in tourism demand by rising relative prices for tourism, due to the above mentioned terms of trade effect.

Thus, the international terms of trade in tourism move fast enough to more than offset the gap in sectoral productivity growth. Then the sum $\dot{y}_T/y_T = \gamma_T + \dot{p}/p$ would steadily be greater than $\dot{y}_M/y_M$, even if the biodiversity utilization growth rate is zero ($\dot{b}/b = 0$). Now we have

(9) $$\frac{\dot{y}_{T_S}}{y_{T_S}} = \gamma_T + \frac{\dot{p}}{p} + \frac{\dot{b}}{b} > \frac{\dot{y}_T}{y_T} = \gamma_T + \frac{\dot{p}}{p} > \frac{\dot{y}_M}{y_M}.$$

Therefore, for a long time a higher rate of GDP-growth in T than in M ($\dot{y}_T/y_T > \dot{y}_M/y_M$) and therefore a convergence from country T to country M is possible.

Summarizing, we can conclude that economic growth based on a fast and unsustainable increase in tourism supply T leads to a short term over-utilization of the free production factor biodiversity B. Thereby it might hide temporarily the logical long-term decline of biodiversity and with it the growth damaging effects of this (mass-) tourism expansion. Nevertheless, long term growth is also possible, if consumers' preferences are such that tourism demand is a superior good on international markets. This second mechanism – which is crucially not based on physical (e.g. more hotels) output expansion, but on higher valued and priced tourism supply – makes tourism based sustainable economic development feasible. Hence, this result rests on sustainable tourism, which is using but is not overusing biodiversity ($b \leq \bar{b}$). While biodiversity is a common good (competition in consumption) with problems described above, "biodiversity watching" is a public good

(no competition in consumption). In turn, this finding suggests the complete allocation of the property rights for biodiversity to private or governmental land owners. If these property rights on B are assigned correctly, rivalry in consumption is likely and a complete exploitation of biodiversity B can be avoided. The land owners' self-interest leads them not to overuse "their" biodiversity.

5.4 Trade in Tourism and Economic Development: The Empirical Evidence

The next step to take is to test the theoretical considerations. We want to know whether biodiversity can contribute to growth via the expansion of sustainable trade. We have to make two distinctions for this purpose: First, we distinguish between OECD and developing countries to figure out whether tourism may be particularly relevant in developing countries. Second, we have to distinguish mass tourism from sustainable tourism; in explaining the drivers of tourism as well as in explaining the potential of tourism for economic growth. Start with the different country groups. In an empirical analysis about the drivers of comparative advantage in tourism and absolute international tourism receipts, Freytag and Vietze (2009) show that biodiversity richness (measured as the number of living and breeding bird species in a country)[44] is contributing to a comparative advantage in tourism (see equation I in

[44] The most important exogenous variables ($BIRDS$ and $ENBIRDS$) as proxies for biodiversity and its loss respectively are measured by the number of bird species in relation to the size of the country in square kilometers (km^2) as done by Asufu-Adjaye (2003). Birds are suitable biodiversity indicators (Riecken 1992; DO-G 1995; Boening-Gaese and Bauer 1996; Plachter et al. 2002; Gregory et al. 2003; BirdLife International 2004; Naidoo and Andamowicz 2005), especially for studies on a global scale (Bibby et al. 1992; Burgess et al. 2002): (1) Individual birds usually have large home ranges in complex habitats that require specific structures for several parts of the life-cycle (e.g. nesting sites, hibernation sites). Thus, they respond often very sensitively to changes in their habitat (e.g. due to economic efforts or due to nature protection efforts). (2) Many species are carnivorous, representing high positions in the food chain. Consequently, many bird species are considered as "flagship species" (Lawton et al. 1998) whose presence indicates the presence of a species-rich animal and plant community. (3) Birds may represent the best-known animal taxon, and an avifauna is available for all countries. (4) The number of bird species cannot be politically instrumentalized (Metrick and Weitzman 1998; Rawls and Laband 2004), as long as the counting is done independently. Additionally, we calculate the ratio of endangered bird species to all bird species in a country ($ENBIRDS$). To use $ENBIRDS$ is sensible. It indicates the incentives in a country to preserve nature and represents the common pool property. The list of endangered birds is applied world-wide. Therefore, even if some distortions are in the list, this holds for all countries similarly. These two variables are statistically not interdependent (see Appendix 4-A). See also Freytag and Vietze 2009.

table 5-2). In addition they show that endangered biodiversity negatively affects the absolute amount of inbound tourism receipts (see equation IV in table 5-2) and that biodiversity richness positively affects the absolute amount of inbound tourism receipts (see equation VII in table 5-2).

Their analysis does not distinguish between industrialized and developing countries. This is done in table 5-2, using their data. Appendix 3-A displays and explains the used data; as well as the data sources. Because it is apparent that the sample does not have disturbances with identical variance, we generally run a White-Heteroskedasticity residual test and use an adjusted OLS-estimator robust to heteroskedasticity in these estimations. We also test for reverse causality between the dependent variable and explanatory variables, running a Granger causality test between $BIRDS$ and tourism receipts per capita (TR). According to this test, we cannot reject the hypothesis that TR does not Granger cause $BIRDS$ but we can reject the hypothesis that $BIRDS$ does not Granger cause TR. Therefore, it appears that Granger causality runs one-way from $BIRDS$ to TR and not the opposite way. Another problem may be multicollinearity, in particular high correlation between the World Bank governance indicators as control variables. To avoid this problem, we do not use all indicators simultaneously. The correlation matrix of all variables is presented in Appendix 4-A. The descriptive statistics referring to revealed comparative advantage of tourism exports (RCA), inbound tourism receipts per capita (TR), tourism arrivals (TA), bird species in relation to the size of the country ($BIRDS$), the ratio of endangered bird species to all bird species ($ENBIRDS$) and the number of UNESCO world heritage sites in relation to the size of the country (WHS) are reported in table 5-1 below.

Table 5-1: Descriptive Statistics Chapter 5

	MIN	MAX	Mean	Median	Std-dev.	N
RCA	-3.660	3.2079	0.5879	0.5671	1.1054	126
TR	0.0177	12,352	815.65	121.81	2,089.3	167
TA	6.000	75,048	3951.8	698.00	9170.6	172
BIRDS	3.69E-05	1.1969	0.0662	0.0038	0.1823	202
ENBIRDS	0.0000	0.4943	0.0709	0.0516	0.0701	203
WHS	0.000	0.0394	0.0004	5.74E-06	0.0030	191

Source: Own estimations.

For OECD-countries as tourism destination, the main driver for comparative advantage (RCA) in tourism is the own GDP per capita, which is not surprising as a high GDP per capita goes along with a high standard of living in the destination (see table 5-2). Equation II and III show that biodiversity as an important driver for comparative advantage in tourism is more relevant for developing countries. The same holds for the relative length of the country's coastline; the other variables display the same overall results. Regarding to the effects of endangered biodiversity on tourism receipts (equation III-VI), one can see that the extent to which biodiversity is endangered is not relevant for OECD-countries but for developing countries all the more. Also the ratio of cultural sites plays an important role in attracting foreign tourists to Non-OECD countries. The last finding is further strengthened by estimations VIII – IX which correspond to the impact of absolute biodiversity richness on tourism demand. As the ratio of WHS do not differ within OECD-countries to a great extent, this result is not surprising. Our variable of interest, the richness of biodiversity in a country, shows the same impact on the absolute amount of inbound tourism receipts for all three estimations. The findings confirm the result that $BIRDS$ is important for absolute tourism receipts in OECD-countries, whereas $ENBIRDS$ impedes tourism exports in developing countries.

Table 5-2: Biodiversity/Endangered Biodiversity and RCA/Tourism Receipts: Empirical Evidence

Model	**I**	**II**	**III**	**IV**	**V**	**VI**	**VII**	**VIII**	**IX**
Dependent Variable	**RCA 2003**	**RCA 2003**	**RCA 2003**	**TR 2003**	**TR 2003**	**TR 2003**	**TR 2003**	**TR 2003**	**TR 2003**
Countries included	All Countries (Freytag and Vietze 2009)	OECD	Non-OECD	All Countries (Freytag and Vietze 2009)	OECD	Non-OECD	All Countries (Freytag and Vietze 2009)	OECD	Non-OECD
Constant	0.724***	1.184***	0.803***	-1,149**	-6,824.1**	-1,114.3**	-1,115.6**	-6,159***	-895.947
	(6.469)	*(3.492)*	*(6.150)*	*(-2.875)*	*(-2.136)*	*(-2.134)*	*(-2.006)*	*(-2.987)*	*(-1.649)*
BIRDS	2.415***	21.324*	*3.029****				2,393.9***	93,534***	2,398.8**
	(3.161)	*(1.797)*	*(4.580)*				*(3.369)*	(25.508)	*(2.372)*
ENBIRDS				-4,616**	1,649.4	-5,510.6*			
				(-2.055)	*(1.080)*	*(-1.953)*			
WHS	-56.500	-375.392	*-60.664*	275,827***	93.0E07*	280,814***	224,830***	-1,317,881	226,318***
	(-0.535)	*(-0.188)*	*(-1.060)*	*(12.687)*	*(1.808)*	*(11.673)*	*(7.446)*	*(-1.691)*	*(8.751)*
GDP2003	-3.1E-5***	-4.1E-5***	-7.8E-5**						
	(-4.436)	*(-3.686)*	(-2.289)						
LE				28.330***	86.189**	28.755**	22.027***	84.632***	18.116*
				(3.393)	*(2.164)*	*(2.483)*	*(2.712)*	*(3.156)*	*(1.902)*
COAST	0.487	*0.871*	*0.597***	198.300	-171.949	208.316	67.322	467.330	79.784
	(1.127)	*(0.220)*	*(1.999)*	*(1.143)*	(-0.085)	*(1.213)*	*(0.535)*	*(0.333)*	*(0.508)*
R^2adj	0.2314	0.3052	0.2018	0.3700	0.4112	0.4089	0.3865	0.9063	0.4237
N	123	29	94	161	30	131	161	30	131

Dependent variable is the RCA-index in 2003; or the amount of tourism receipts per capita in 2003.
See Appendix 3-A; for sources see also Appendix 3-A. For countries see Appendix 1-A.
Absolute t-values in parenthesis.
* Significant at the 90 percent level.
** Significant at the 95 percent level.
*** Significant at the 99 percent level.

This exercise shows the relative importance of tourism for developing countries again as well as the relevance of biodiversity protection. It is not distinguished between different forms of tourism. According to our model however, it is sensible to distinguish two types of tourism at this point. Derived from the definition of sustainable development of the Brundtland-Report (UN 1987), sustainable tourism is a tourism development that meets the needs of the present without compromising the ability of future generations of both, visitors and the tourism industry, to meet their own needs. By contrast, unsustainable (mass-) tourism is based on an output expansion at the expense of future generations through an exhaustible consume of nature and culture.

The outcome of our theoretical model suggests that a developing country can maintain a catching-up process by concentrating on sustainable tourism (with relatively high income and low price elasticity of demand) and using its natural endowment as an input into the production process. To the contrary, mass-tourism is obviously less attractive as it could be characterized by the opposite elasticity structure. Therefore, to compete on this market and to increase income and employment via mass tourism, the output measured in tourist arrivals has to be increased over time. This does not necessarily but probably lead to an overuse of the input factor, in particular as mass-tourism depends neither on biodiversity nor on other elements of highly priced tourism such as culture.

The latter has been shown by Bigano et al. (2005) and is further validated in table 5-3. Instead of the absolute amount of receipts generated through international tourism, we focus on the number of tourist arrivals[45] in 2003 (World Tourism Organization 2007b) in a country as endogenous variable, to specify the potential for development via tourism more exactly. As tourism arrivals count the absolute number of foreigners who come into a respective country for holiday purposes, we use this variable to distinguish between high priced quality tourism and mass-tourism. To control this variable for country size and population, we use these as additional control variables.[46]

$$M0: \quad TA_i = \beta_0 + \beta_1 BIRDS + \beta_{1+j} x_{1+j} + \varepsilon_i$$

$$x_{1+j} \text{ representing controls, namely } GDP2000, WHS, LE, CCOR, POLST, LAW, VOICE, EQ, COAST, BORD, SIZE, POP, IUCN \text{ and } NET$$

[45] This variable is used in lot of other tourism analyses (Song and Li 2008). Crouch (1994d) indicates that of the 85 tourism studies reviewed, 48 per cent chose tourists arrivals as the measure of demand.

[46] The variables are explained in Appendix 3-A.

Table 5-3: Biodiversity and Tourism Arrivals: Empirical Evidence

	I	II	III	IV	V	VI	VII	VII
Constant	-4,307**	-4,841***	-18,434***	-4,902**	-1,565	-2,714	-1,451	-2,420
	(-2.175)	*(-2.678)*	*(-3.034)*	*(-2.205)*	*(-0.925)*	*(-1.473)*	*(-0.856)*	*(-1.428)*
BIRDS	-3.167	-2,245	-135.0	-1,776	-2,836	-974.5	-3,046	-921.6
	(-1.503)	*(-1.007)*	*(-0.067)*	*(-0.219)*	*(-0.525)*	*(-0.129)*	*(-0.563*	*(-0.169)*
WHS	-38,586	-44,311	15,121	11,244,565	163,814	87,300	75,646	92,859
	(-0.738)	*(-0.703)*	*(0.370)*	*(0.883)*	*(0.789)*	*(0.394)*	*(0.366)*	*(0.439*
GDP2000	0.451***	0.419***						
	(3.427)	*(2.842)*						
LE			77.85***					
			(3.151)					
CCORR					4,070***			
					(4.559			
POLST						2,901***		
						(2.840)		
LAW							4,371***	
							(4.590)	
VOICE								3,342***
								(3.753)
EQ		45.84	38.45*	22.8	38.58	99.53*	33.96	84.97*
		(1.457)	*(2.198)*	*(0.630)*	*(0.727)*	*(1.825)*	*(0.635)*	*(1.675)*
COAST	485.3*	578.1*	233.4					
	(1.868)	*(1.931)*	*(1.040)*					
BORD	1,053**	1,101**	1,035*	1,198.2**	1,174***	1,011***	1,186***	1074***
	(2.170)	*(2.054)*	*(1.891)*	*(2.059)*	*(3.718)*	*(2.974)*	*(3.754)*	*(3.351)*
SIZE	0.0005	0.0005	0.0008	0.0005	0.0006	0.0009*	0.0007	0.0005
	(0.690)	*(0.651)*	*(0.956)*	*(0.591)*	*(1.255)*	*(1.825)*	*(1.458)*	*(1.646)*
POP	0.0099	0.092	0.0050	0.0087	0.0079	0.0075	0.0064	0.0075
	(1.509)	*(1.387)*	*(0.770)*	*(1.371)*	*(1.324)*	*(1.171)*	*(1.065)*	*(1.221)*
IUCN		-45.56						
		(-0.548)						
NET				26.51***				
				(3.237)				
R²adj	0.2977	0.2966	0.2505	0.2813	0.2986	0.2339	0.2998	0.2683
N	159	148	149	116	149	143	149	149

Sources: See Appendix 3-A.
Dependent variable is the number of tourism arrivals in 2003. Absolute t-values in parenthesis.
* Significant at the 90 percent level.
** Significant at the 95 percent level.
*** Significant at the 99 percent level.

Table 5-4: Biodiversity and Tourism Arrivals: Empirical Evidence for OECD and Developing Countries

	I	II	III	IV	V	VI
Countries Included	OECD	Non-OECD	OECD	Non-OECD	OECD	Non-OECD
Constant	5,375	-1,332*	-181,79	-5,476***	6,357	80.577
	(0.442)	*(-1.905)*	*(-1.351)*	*(-3.007)*	*(0.524)*	*(0.118)*
BIRDS	-560,509**	-862.62	-220,075	572.06	-325,252	-1,195.5
	(-1.996)	*(-0.729)*	*(-1.025)*	*(0.421)*	*(-1.540)*	*(-0.973)*
WHS	17,101,112	54,130	10,196,492	89,782***	25,206,877	136,237***
	(-0.371)	*(1.475)*	*(0.220)*	*(3.093)*	*(0.556)*	*(7.532)*
GDP2000	0.775	0.175***				
	(1.144)	*(2.903)*				
LE			2,445	84.203***		
			(1.376)	*(2.944)*		
CCORR					4,779	1,661
					(0.827)	*(3.375)*
EQ	-436.72	14.910	-211.19	6.031	-306.45	16.338
	(-1.200)	*(0.784)*	*(-0.921)*	*(0.279)*	*(-0.843)*	*(0.803)*
COAST	-7,440	185.89	-4,998	49.843		
	(-0.235)	*(1.217)*	*(-0.121)*	*(0.351)*		
BORD	3,211*	310.94**	3,381*	336.65**	3,188*	340.1**
	(1.810)	*(2.202)*	*(1.920)*	*(2.182)*	*(1.751)*	*(2.383)*
SIZE	-0.0001	0.0003	0.0002	0.0003	0.0003	0.0003
	(-0.114)	*(0.528)*	*(0.217)*	*(0.452)*	*(0.292)*	*(0.576)*
POP	0.0721	0.0119	0.1045**	0.0110	0.1043***	0.0113
	(1.652)	*(1.461)*	*(2.385)*	*(1.368)*	*(2.894)*	*(1.385)*
R^2adj	0.2459	0.4778	0.2894	0.4390	0.2483	0.4686
N	28	120	28	121	28	121

Sources: See Appendix 3-A.
Dependent variable is the number of tourism arrivals in 2003. Absolute t-values in parenthesis.
* Significant at the 90 percent level.
** Significant at the 95 percent level.
*** Significant at the 99 percent level.

As can be seen in tables 5-3 and 5-4, the additional control variables remain mostly stable and significant ($GDP2000$, LE, $CCORR$, $POLST$, LAW, $VOICE$, NET) whereas both $BIRDS$ as proxy for biodiversity and WHS as proxy for culture lose

their explanatory power.[47] In one case biodiversity has even a significant negative impact on the number of tourists traveling to a country. We find this evidence plausible as arrivals do not say anything about the sustainability of tourism, but rather reflect the share of mass-tourism. The significant positive impact of the number of national borders and length of the coast-line in relation to the size of the country (as proxy for beaches) has on tourism arrivals, is supporting this finding, as low costs for (land-based) travels and nice beaches are typical determinants promoting the demand for mass-tourism. Table 5-3 shows the results for the whole sample, whereas table 5-4 distinguishes between OECD and developing countries. The outcome is similar for both country groups. Mass-tourism is not driven by nature.

This result has serious implications for economic policy concerning tourism. If nature is not relevant for the number of arrivals, a concentration on mass tourism might lead to a neglect of nature by the individual suppliers of tourism. In this case, the regeneration of nature will probably be below the ecologically and economically sustainable and necessary degree, causing a loss of biodiversity and in the long-run also losses from trade (see theoretical section).

Next, we test the growth enhancing potential of mass tourism versus sustainable tourism explicitly. We control the theoretical and previous empirical findings in the literature, concerning the positive impact of tourism on economic development. To do so, we try to explain GDP growth between 2003 and 2006 with tourism arrivals per capita 2003 ($TApCapita$) as variable of mass-tourism, and with tourism expenditures per GDP 2003 ($TRpGDP$) as variable of sustainable tourism respectively. Countries concentrating on mass tourism in the past have a high share of tourists relative to their number of inhabitants (see Model 1 below), whereas countries which extended their tourism sector sustainable obtain high tourism receipts relative to their absolute GDP (see Model 2 below). More explicitly, we explain in the following estimation the rate of GDP growth 2003 to 2006 ($GDPgrowth03-06$) with the variable for tourism and five control variables. As also done by Arezki et al. (2009), we use the empirically most important determinants of economic growth. These comprise the

[47] We do not use $GDP2000$, LE, $CCORR$, $POLST$, LAW, $VOICE$, NET simultaneously in the same estimation because they are highly auto correlated (see Appendix 4-A). This holds also for LE and $CCORR$, $POLST$, LAW and $VOICE$.

absolute GDP per capita ($GDP2003$, regarding the convergence hypothesis we expect a negative sign); the openness to trade ($OpenT$, positive sign expected)[48]; the level of the country's education, measured via the HDI-education sub index ($HDIedu$, positive); the price level of investment goods relative to the price of consumer goods ($Kprice$, negative[49]), and the level of economic freedom (we use the Heritage Foundation Index of Economic Freedom (IEF) and expect a positive sign):

$$M1: \quad GDPgrowth03-06_i = \beta_0 + \beta_1 TApCapita + \beta_{1+j} x_{1+j} + \varepsilon_i$$
$$x_{1+j} \text{ representing controls, namely } GDP2003, OpenT, HDIedu, Kprice \text{ and } IEF$$

$$M2: \quad GDPgrowth03-06_i = \beta_0 + \beta_1 TRpGDP + \beta_{1+j} x_{1+j} + \varepsilon_i$$
$$x_{1+j} \text{ representing controls, namely } GDP2003, OpenT, HDIedu, Kprice \text{ and } IEF$$

The output of the White Heteroskedasticity-Consistent estimation is displayed in table 5-5 below. There is clear evidence that sustainable tourism is growth enhancing. More specific, the higher the share of tourism receipts on countries' GDP the higher is the economic growth in the following three years. On the other side of the coin, mass-tourism (measured as tourism arrivals per domestic inhabitants) is not; but even could deter growth. The coefficient of this relation is negative, although not significant. The other control variables of the growth model show the expected sign (except for IEF) and are significant (except for $Kprice$). An open trade regime and good education possibilities[50] enhance economic growth, which is the greater the lower the starting point (GDP per capita) is.

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48 This variable is also suggested for growth models by Alcala and Ciconne (2004).

49 Klenow and Hsieh (2007) provide evidence that a high relative price of investment goods can impediment economic growth and development.

50 Education is more significant for economic growth in tourism countries (higher share of tourism receipts per GDP) and a simultaneously lower GDP per capita.

Table 5-5: Economic Growth and Countries Specialized in Mass versus Sustainable Tourism

	M1	M2
Constant	0.2002***	0.0922*
	(2.709)	*(1.731)*
TApCapita	-0.0074	X
	(-1.271)	
TRpGDP	X	0.0174**
		(2.415)
GDP2003	-1,92E-06***	-2.17E-06***
	(-3.155)	*(-3.659)*
OpenT	0.0003***	0.0003***
	(3.244)	*(3.207)*
HDIedu	0.0968	0.2030***
	(1.481)	*(4.042)*
Kprice	-0.0092	-8.33E-05
	(-1.481)	*(-0.017)*
IEF	-0.0013	-0.0013*
	(-1.571)	(-1.698)
R^2adj	0.0990	0.1993
N	131	130

Sources: See Appendix 3-A.
Dependent variable is the GDP growth 2003-2006.
Absolute t-values in parenthesis.
* Significant at the 90 percent level.
** Significant at the 95 percent level.
*** Significant at the 99 percent level.

Thus, the lesson for developing countries is pretty clear. It is not sensible to concentrate on mass-tourism. This market segment is not characterized by high income elasticity of demand and does not provide incentives to invest into biodiversity. Rather, developing countries should take measures to preserve nature and invest into sustainable tourism, which could – via gains from international trade – enhance economic growth and has positive effects on biodiversity, as long as it is the abundant factor.

5.5 *Summary and Policy Conclusions*

In this paper we discuss how biodiversity contributes to trade structures and economic growth in an endogenous growth framework. We conclude theoretically that a long-term growth is also possible in a tourism country with a smaller endogenous growth like in industrialized countries, if these countries being engaged in international trade and consumers' preferences are such that tourism demand is highly valued on international markets.

By testing the assumed effects of the countries' biodiversity endowment on the respective received tourism receipts, our theoretical model gains further empirical support. As there is a robust positive impact of biodiversity on the comparative advantage in tourism services in poor countries (stronger than in the OECD), the potential of sustainable tourism can be seen via absolute inbound tourism receipts per capita. These are positively influenced by the richness of biodiversity and negatively determined by a potential biodiversity loss. Contrarily, if we take only the absolute number of tourism arrivals as endogenous variable taking unsustainable (mass-) tourism into consideration instead, the regression result do not hold stable. These results support the idea that only sustainable tourism is driven by biodiversity. By testing the impact of these two different kinds of tourism on economic growth empirically, we conclude that sustainable tourism is beneficial for growth (and therefore for economic development) while unsustainable (mass-) tourism is not growth enhancing in the long-run. To allow for long-term growth, countries must not overuse their nature, here applied as biodiversity, but should use it as a valuable input factor.

Further research is necessary about price and income elasticityies for sustainable tourism. Nevertheless, our results give us an encouraging hint that it makes sense for developing countries to preserve their biodiversity by assigning the property rights of these natural resource to private or governmental land owners or even to invest into more biodiversity.

6 Conclusion of Thesis

Like in several sectors of consumer demand, attitudes, believes, and the political environment may also influence the worldwide demand for tourism. Consequentially, this thesis concentrates on a wider range of determinants including non-economical factors of tourism demand in both the country of origin and destination at a worldwide scale.

So, the aim of the thesis was to show how the most relevant economical, geographical and socio-cultural determinants influence the demand for tourism. The second intent was to analyze whether and how (sustainable) tourism can be a trigger for economic development. The thesis comprises four chapters composed of four single published papers.

First, the pull factors of tourism demand in the countries of origin are analyzed. Thus, the incentives of foreign tourists to travel in a certain country of destination have been investigated. Among others we are able to show a positive impact of biodiversity on the comparative advantage in tourism services in poor countries which is statistically robust. Moreover, the potential of sustainable tourism can be indirectly seen by absolute inbound tourism receipts per capita, as these are positively influenced by the richness of biodiversity and negatively determined by a potential biodiversity loss. These results support the idea that sustainable tourism is growth friendly, although, no strong evidence was provided at this stage of research. Additionally, we find further important pull factors of tourism demand in the country of destination like the cultural richness (UNESCO World Heritage sites) and the per capita income, as a proxy for the level of development. Additionally, it is shown that safety (expressed as high life expectancy and good governance) is a relevant predictor for tourists' choice of a destination. Not least, mild climate and good communication possibilities in a country of destination are also impacting tourism demand positively, as tourists' care for complementary goods and services.

Furthermore in a second step, the determinants which contribute to outbound tourism expenditures in the countries of origin are discussed. In other words, we analyze the push factors of tourism demand. While we find a positive and robust impact of all economic factors considered (like GDP per capita, and the openness to trade) on the

tourism expenditures per capita as well as on tourism expenditures per GDP, most of the sociological factors (e.g. the literacy rate and the control variables for the attractiveness of domestic tourism) show rather a weak significance. However, we could find somewhat like a mutual openness to tourism, as countries which are able to attract high inbound tourism receipts per capita have high outbound tourism expenditures per capita as well. A further important finding of this section is that people living in democratic countries with a high level of civil rights and good political stability spend a higher share of income for travelling abroad. Additionally, the hypothesis that good information possibilities in the country of origin encourage foreign travel can be confirmed empirically by estimating the impact of information infrastructure on tourism demand. These results support the idea that important factors are promoting foreign tourism besides the expected impact of the per capita income in the country of origin. Nevertheless, it is evidenced that it makes sense for developing countries to sustainable invest in the tourism sector as an increasing willingness to pay for outbound tourism goes hand in hand with an increasing per capita income in the world.

To combine supply and demand side of tourism flows, we run an estimation model in chapter 4 which includes the relevant determinants in the country of origin and in the country of destination as well. With regard to the content, the impact of cultural – and particularly religious – factors on tourist flows into the USA as the world largest tourism destination is investigated empirically. As estimation technique an augmented gravity equation is chosen. Besides the basic variables size (country's GDP) and distance (distance between the capitals of the countries of origin and Washington, D.C.) we include a set of variables that allows us to control for important exogenous determinants of international tourism flows (the use of a common language (English); island and border status; special visa facilities; the relative costs of living; the governance situation; etc.). Besides empirical results, the findings give evidence that the gravity equation is an excellent instrument to explain variations in international tourism flows. The main research question was whether tourists go on holiday to become acquainted with foreign cultures. With respect to our empirical results, we are able to reject this hypothesis, as our findings show that cultural proximity between the country of origin and the country of destination has a positive effect on tourism flows between these countries. In particular, by controlling for a set of geographic variables, it has been visible that people from countries with the same

language (English) and the same high governmental ranking like the USA, show a higher demand for traveling into the USA for holiday than people from other countries. Overall, we find clear evidence that tourists coming from Christian – and here particularly from Catholic and Protestant – countries, prefer the USA as a destination for holiday much stronger than people from Muslim countries. As a common religion represent a strong common cultural background, these support our argument that people rather choose countries with a similar cultural and political background for holiday.

As closing chapter of this thesis, we discuss how biodiversity contributes to trade structures and economic growth in a trade based endogenous growth framework. By exploring a theoretical model, we show that long term growth is also possible in a tourism country with smaller endogenous growth as in the industrialized country. Preconditions for this result are that, first, the countries being engaged in international trade and that, second, consumer's preferences are such that tourism demand is highly valued on international markets. This mechanism – which is crucially not based on physical output expansion (e.g. more hotels), but on higher valued tourism supply – makes tourism based sustainable economic development feasible. Though, this demands the development of sustainable tourism, which is using but is not overusing biodiversity. We also investigated the impact of the countries' biodiversity endowment on the respective received tourism receipts empirically. We are able to find a positive and robust effect of biodiversity on the comparative advantage in tourism services in poor countries. Furthermore, the potential of sustainable tourism to enhance economic growth can be seen via absolute inbound tourism receipts per capita. These are positively influenced by the richness of biodiversity and negatively determined by a potential biodiversity loss. Contrary, if we solely take the absolute number of tourism arrivals as endogenous variable for unsustainable (mass-) tourism into consideration instead, the regression result do not hold stable. Moreover in a second step, we are able to show empirically a positive influence of sustainable tourism on economic growth. These findings support the idea that it is possible that specialising in tourism can boost economic growth in countries which are well endowed in biodiversity, but only if biodiversity is used sustainable.

Although tourism is able to enhance economic growth in countries specialized in this industry, our results show that tourism requires some special condition in both the country of origin and the country of destination. First of all, as tourism is evidenced as being a superior good, the development level measured by income in the origin country plays a major role in explaining tourism demand. Though, the cultural openness of a society is an important precondition from the country of origins' point of view. Regarding the tourism exporting countries (countries of destination), the most interesting outcome of this thesis is that biodiversity as proxy for "nice nature" is an important supply factor; besides the countries' cultural heritages and visitor's safety as well. Together with the tourism's potential to enhance economic growth, this reflects the value biodiversity can play for economic development. Hence, the most important requirement for this mechanism is the allocation of property rights on biodiversity to private or public (land-) owners to give them an economic incentive to use "their" nature sustainably.

To evaluate the development potential for developing countries via tourism income, further research is necessary to learn more about price and income elasticities of (sustainable) tourism. At the demand side, research in the form of surveys and experiments on psychological attitudes and the behavior of tourists should be done. As our findings (Freytag and Vietze 2010) show that high income tourists as well as mass tourists have different demand regarding their preferred destination, it is important to research more about the demand of the respective social levels. Moreover, this argument gains further support as Lim (1997b) stated that a large number of socio-economic factors influence the choice of international tourism. With regard to the country of origin, determinants including tourists' attributes (gender, age, educational level, and employment/profession, which may affect trip motives or frequency and leisure time availability); household size (composition of household, and children's age); or the change of population should be further focused. Regarding the destination country, social and sporting events (e.g. Expo, Olympic Games, soccer world cups) are assumed to have major effects on tourism demand. However, this topic is not researched currently. As another important determinant affecting tourism demand are safety conditions (see e.g. Lim 1997b, Freytag and Vietze 2009, 2010), the impact of the threat of terrorism, political unrest, or grounding aircraft strike on tourism flows should be investigated in future research.

Regarding the methodological issue in our gravity analysis (Vietze 2008), it is necessary to extend the sample to investigate other countries of destination. This is directly related to the need of valid country-to-country import-export data on tourism, especially in developing countries. As this is the most crucial issue in extending the research on tourism, the UNWTO has set up the project *Tourism Satellite Account* (TSA). The project aims for matching the national country statistics on tourism data. Moreover, the UNWTO advices the country's national statistical offices to standardize their measurers to generate comparable datasets (UN 2008).

Our results evidence that it is important for developing countries to preserve their biodiversity by assigning the property rights of there natural resources to private or governmental land owners. This seems to be a key issue to extent research on property rights of non-exhaustible natural resources in general, as the specific construction of property rights on biodiversity should be very sensible with regard to their utilization and therefore the produced tourism output.

Appendix

Appendix 1-A: Countries included in the Analysis

Afghanistan
Albania
Algeria
American Samoa
Andorra
Angola
Antigua and Barbuda
Argentina
Armenia
Aruba
Australia
Austria
Azerbaijan
Bahamas
Bahrain
Bangladesh
Barbados
Belarus
Belgium
Belize
Benin
Bermuda
Bhutan
Bolivia
Bosnia and Herzegovina
Botswana
Brazil
Brunei
Bulgaria
Burkina Faso
Burundi
Cambodia
Cameroon
Canada
Cape Verde
Cayman Islands
Central African Rep.
Chad
Chile
China
Colombia
Comoros
Congo, Dem. R.
Congo, Rep. of
Costa Rica
Cote d'Ivoire
Croatia
Cuba
Cyprus
Czech Republic
Denmark
Djibouti
Dominica
Dominican Rep.
Ecuador
Egypt
El Salvador
Equatorial Guinea
Eritrea
Estonia
Ethiopia
Fiji
Finland
France
French Polynesia
Gabon
Gambia
Georgia
Germany
Ghana
Greece
Grenada
Guam
Guatemala
Guinea
Guinea-Bissau
Guyana
Haiti
Honduras
Hong Kong
Hungary
Iceland
India
Indonesia
Iran, Islamic Rep.
Iraq
Ireland
Israel
Italy
Jamaica
Japan
Jordan
Kazakhstan
Kenya
Kiribati
Korea, DPR
Korea, Republic of
Kuwait
Kyrgyzstan
Laos
Latvia
Lebanon
Lesotho
Liberia
Libya
Liechtenstein
Lithuania
Luxembourg
Macao
Macedonia, FYR
Madagascar
Malawi
Malaysia
Maldives
Mali
Malta
Marshall Islands
Mauritania
Mauritius
Mayotte
Mexico
Micronesia
Moldova
Monaco
Mongolia
Morocco
Mozambique
Myanmar
Northern Mariana Is
Namibia
Nepal
Neth. Antilles
Netherlands
New Zealand
New Caledonia
Nicaragua
Niger
Nigeria
Norway
Oman
Pakistan
Palau
Panama
Papua New Guinea
Paraguay
Peru
Philippines
Poland
Portugal
Puerto Rico
Qatar
Romania
Russian Federation
Rwanda
Saint Kitts and Nevis
Saint Lucia
Saint Vincent a t Grenadines
Samoa
San Marino
Sao Tome and Principe
Saudi Arabia
Senegal
Seychelles
Sierra Leone
Singapore
Slovakia
Slovenia
Solomon Islands
Somalia
South Africa
Spain
Sri Lanka
Sudan
Suriname
Swaziland
Sweden
Switzerland
Syria
Taiwan
Tajikistan
Tanzania
Thailand
Togo
Tonga
Trinidad and Tobago
Tunisia
Turkey
Turkmenistan
Uganda
Ukraine
United Arab Emirates
United Kingdom
United States
Uruguay
Uzbekistan
Vanuatu
Venezuela
Vietnam
Virgin Island
Yemen
Zambia
Zimbabwe

Appendix 2-A: Correlation Matrix Chapter 3

	$TE_i^{P.C}$	$TE_i^{P.GDP}$	GDP	POP	SIZE	BORD	COAST	WHS	EQR	LE	LIT	OPEN	TR	CCORR	GOVEFf	LAW	POLST	VOICE	NET	TEL	TV
$TE_i^{P.C}$	1.000																				
$TE_i^{P.GDP}$	0.896	1.000																			
GDP	0.765	0.543	1.000																		
POP	0.509	0.458	0.222	1.000																	
SIZE	-0.107	-0.177	0.160	-0.094	1.000																
BORD	-0.213	-0.231	-0.213	-0.208	0.299	1.000															
COAST	0.545	0.479	0.313	0.855	-0.112	-0.300	1.000														
WHS	0.318	0.208	0.437	-0.033	-0.228	-0.040	-0.020	1.000													
EQR	0.362	0.230	0.602	-0.116	0.023	-0.002	-0.006	0.437	1.000												
LE	0.469	0.375	0.642	0.186	0.120	-0.176	0.258	0.405	0.529	1.000											
LIT	0.369	0.328	0.586	0.098	0.064	-0.168	0.193	0.363	0.565	0.689	1.000										
OPEN	0.488	0.498	0.207	0.681	-0.268	-0.307	0.579	0.063	0.032	0.136	0.238	1.000									
TR	0.758	0.589	0.670	0.403	-0.094	-0.189	0.479	0.443	0.414	0.519	0.448	0.422	1.000								
CCORR	0.723	0.543	0.917	0.235	0.093	-0.268	0.291	0.410	0.578	0.583	0.516	0.263	0.755	1.000							
GOVEFf	0.673	0.479	0.909	0.247	0.108	-0.219	0.298	0.460	0.610	0.630	0.587	0.290	0.765	0.956	1.000						
LAW	0.686	0.513	0.905	0.203	0.083	-0.250	0.273	0.430	0.610	0.604	0.552	0.255	0.743	0.972	0.968	1.000					
POLST	0.531	0.416	0.690	0.168	0.011	-0.254	0.247	0.265	0.558	0.444	0.517	0.334	0.611	0.778	0.787	0.822	1.000				
VOICE	0.463	0.299	0.774	0.053	0.041	-0.286	0.168	0.464	0.600	0.534	0.597	0.096	0.636	0.805	0.838	0.832	0.754	1.000			
NET	0.663	0.493	0.889	0.272	0.137	-0.273	0.338	0.365	0.583	0.632	0.598	0.262	0.681	0.864	0.875	0.861	0.683	0.774	1.000		
TEL	0.671	0.469	0.938	0.221	0.162	-0.169	0.322	0.487	0.664	0.691	0.651	0.178	0.762	0.869	0.887	0.874	0.674	0.804	0.913	1.000	
TV	0.537	0.354	0.841	0.059	0.189	-0.131	0.204	0.357	0.724	0.712	0.679	0.054	0.569	0.757	0.774	0.765	0.619	0.722	0.831	0.872	1.000

Appendix 3-A: Data used in Chapter 5

Symbol in Analysis	Name of Variable	Proxy for	Year	Source
RCA	Revealed comparative advantages	Comparative advantages for tourism, compared to trade†	2003	World Tourism Organization (2007b); WTO (2006)
TR	Tourism receipts (per capita)	Tourism receipts per capita, proxy for quality tourism	2003	World Tourism Organization (2007b)
TA	Tourism arrivals	Tourism arrivals, proxy for mass tourism	2003	World Tourism Organization (2007b)
GDPgrowth 03-06	Growth of total GDP 2003 till 2006	GDP Growth	2003	IMF 2006
TApCapita	Tourism arrival per capita	Share of foreign tourists per domestic population, proxy for mass tourism	2003	World Tourism Organization (2007b), Heston et al. 2006
TRpGDP	Tourism receipts per GDP in PPP constant US-$	Share of earnings from tourism per GDP, proxy for quality tourism	2003	World Tourism Organization (2007b), IMF 2006
BIRDS	Absolute amount of bird species in relation to size of country in km^2	Level of biodiversity‡	2003	BirdLife International 2005
ENBIRDS	Ratio of endangered bird species to all bird species in a country	Level of biodiversity loss	2003	BirdLife International 2005
GDP2000	Real GDP per capita in current US-$ in 2000	Level of disposable income, (lagged because of holiday booking in advance)	2000	IMF 2006
GDP2003	Real GDP per capita in current US-$ in 2003	Level of current development, and quality of life	2003	IMF 2006
LE	Average life expectancy (in years)	Level of current development, especially safety and the quality of the health system	2003	CIA 2005
POP	Absolute amount of population	Absolute amount of population	2003	Heston et al. 2006
SIZE	Size in square kilometers	Size of country	time-invariant	CIA 2005
BORD	Land borders	Number of direct land borders	time-invariant	CIA 2005
OpenT	Openness to trade	Trade in relation of country's GDP; exports plus imports in current US-$ divided by GDP per capita in current US-$	2003	Heston et al. 2006
HDIedu	Human Development Report, Education Index	Quality of education system; index combined of gross enrolment ratio for primary, secondary and tertiary schools and adult literacy rate	2003	UNDP 2005
Kprice	Price of capital goods relative to consumption goods	Ratio price level of investment goods relative to price level of consumption goods	2003	Heston et al. 2006

COAST	Length of the coast line (in km) in relation to the size of the country in square km	Length of beaches for recreation	time-invariant	CIA 2005
WHS	Number of UNESCO World Heritage sites in relation to the size of the country in square km	Influence of important historical and cultural sites on tourism	2003	German Commission for UNESCO 2005
EQ	Distance of the country (approximate geographic center) to the Equator in grad (longitude)	Differences in climate	time-invariant	CIA 2005
IUCN	Ratio of IUCN category I-IV protected areas per total land area	Additional proxy for assigned property rights of biodiversity to public land owners	2003	WRI 2006
NET	Number of internet accesses per thousand inhabitants	Communication possibilities regarding tourism	2003	World Bank 2007
IEF	Heritage Foundation Index of Economic Freedom	Quality of institutions regarding business activity	2003	Heritage Foundation 2010
CCORR	World Bank governance indicator for control of corruption	Safety of destination and quality of institutions (absence of corruption)	2002	Kaufmann et al. 2006
POLST	World Bank governance indicator for political stability	Safety of destination and quality of institutions (stability of governmental system)	2002	Kaufmann et al. 2006
LAW	World Bank governance indicator for rule of law	Safety of destination and quality of institutions (civil rights, independence of justice)	2002	Kaufmann et al. 2006
VOICE	World Bank governance indicator for voice and accountability	Safety of destination and quality of institutions (freedom of press)	2002	Kaufmann et al. 2006

† The RCA-index for country i is calculated as follows: $RCA(1)_{Ti} = \ln \frac{X_{Ti} / M_{Ti}}{\sum X_i / \sum M_i}$, were X_{Ti} are the inbound tourism receipts, M_{Ti} are the outbound tourism expenditure. The variables X_i and M_i are the total amount of goods and services exported and respectively imported by country i. Another measure reflecting revealed comparative advantages for the tourism industry T in country i is calculated as follows: $RCA(2)_{Ti} = \ln \frac{X_{Ti} / \sum X_{Ti}}{X_i / \sum X_i}$, were X_{Ti} are the inbound tourism receipts. The variables X_i is the total amount of goods and services exports of country i. The results are similar, and hold stable throughout the regression. This is not astonishing as both RCA-Indices are highly correlated ($corr(RCA(1)_{Ti}; RCA(2)_{Ti}) = 0.8747$).

‡ An alternative to the use of number of species for monitoring changes in biodiversity is a biodiversity index relying on individual countries' richness as favored by Magurran (2004) and by Bruckland et al. (2005). The theoretical rigor of their argument is convincing but our indicator ($BIRDS$) is the only indicator which is available worldwide on country scale.

Appendix 4-A: Correlation Matrix Chapter 5

	RCA	TR	TA	BIRDS	ENBIRDS	GDP growth 03-06	TRp GDP	TAp Capita	WHS	GDP 2000	GDP 2003	LE	SIZE	POP	OpenT	HDIedu	Kprice	IEF	CCORR	POLST	LAW	VOICE	EQ	COAST	BORD	IUCN	NET
RCA	1,000																										
TR	-0,032	1,000																									
TA	0,000	0,358	1,000																								
BIRDS	-0,108	0,255	-0,005	1,000																							
ENBIRDS	0,075	0,030	-0,032	0,178	1,000																						
GDPgrowth03-06	-0,025	-0,204	-0,043	0,035	0,058	1,000																					
TRpGDP	-0,367	-0,308	-0,123	-0,081	0,022	0,139	1,000																				
TApCapita	-0,003	0,873	0,419	0,330	-0,073	-0,042	-0,297	1,000																			
WHS	-0,048	0,453	0,185	-0,074	-0,287	-0,122	-0,201	0,309	1,000																		
GDP2000	-0,450	0,725	0,456	0,265	-0,017	-0,245	-0,224	0,608	0,412	1,000																	
GDP2003	-0,406	0,725	0,432	0,127	-0,145	-0,263	-0,200	0,566	0,433	0,944	1,000																
LE	-0,235	0,448	0,326	0,160	0,106	-0,068	-0,155	0,385	0,381	0,611	0,525	1,000															
SIZE	-0,115	-0,163	0,303	-0,089	0,139	0,081	0,168	-0,168	-0,251	0,094	0,056	0,041	1,000														
POP	-0,075	-0,157	0,246	-0,057	0,136	0,202	0,312	-0,166	-0,128	-0,088	-0,073	0,004	0,576	1,000													
OpenT	-0,066	0,338	-0,060	0,752	0,106	0,161	-0,242	0,491	0,053	0,250	0,127	0,205	-0,240	-0,191	1,000												
HDIedu	-0,223	0,460	0,317	0,059	0,071	0,109	-0,359	0,428	0,395	0,603	0,531	0,730	0,062	-0,090	0,205	1,000											
Kprice	0,300	-0,434	-0,334	-0,132	-0,074	0,088	0,078	-0,373	-0,337	-0,596	-0,540	-0,628	-0,103	-0,081	-0,124	-0,714	1,000										
IEF	-0,212	0,576	0,146	0,404	0,111	-0,251	-0,298	0,530	0,206	0,694	0,624	0,448	-0,014	-0,208	0,461	0,535	-0,456	1,000									
CCORR	-0,272	0,731	0,368	0,238	0,003	-0,255	-0,281	0,610	0,395	0,899	0,865	0,508	0,035	-0,092	0,246	0,532	-0,542	0,751	1,000								
POLST	-0,079	0,605	0,260	0,163	0,004	-0,056	-0,397	0,587	0,239	0,634	0,616	0,382	-0,032	-0,135	0,312	0,568	-0,350	0,642	0,747	1,000							
LAW	-0,244	0,728	0,377	0,192	0,009	-0,201	-0,289	0,624	0,416	0,882	0,853	0,510	0,020	-0,063	0,247	0,557	-0,538	0,725	0,974	0,790	1,000						
VOICE	-0,106	0,640	0,310	0,029	-0,005	-0,203	-0,350	0,527	0,451	0,724	0,732	0,468	-0,047	-0,161	0,081	0,672	-0,575	0,654	0,807	0,763	0,821	1,000					
EQ	-0,245	0,400	0,279	-0,201	-0,269	0,246	-0,102	0,382	0,399	0,509	0,556	0,442	-0,020	-0,048	-0,007	0,587	-0,385	0,252	0,512	0,522	0,549	0,548	1,000				
COAST	-0,124	0,384	0,054	0,620	0,187	-0,009	-0,111	0,491	-0,049	0,346	0,248	0,239	-0,114	-0,066	0,659	0,140	-0,186	0,480	0,282	0,234	0,260	0,127	-0,054	1,000			
BORD	-0,043	-0,130	0,316	-0,212	-0,245	0,251	0,157	-0,064	-0,016	-0,179	-0,147	-0,191	0,346	0,462	-0,267	-0,088	0,086	-0,385	-0,229	-0,171	-0,196	-0,271	0,073	-0,305	1,000		
IUCN	-0,063	0,057	-0,098	-0,040	0,026	-0,192	-0,049	-0,032	-0,021	0,016	0,008	-0,057	-0,023	-0,067	-0,052	-0,014	-0,059	0,073	-0,014	-0,130	-0,027	-0,042	-0,339	0,049	0,070	1,000	
NET	-0,364	0,629	0,361	0,240	0,039	-0,126	-0,231	0,532	0,359	0,870	0,821	0,588	0,053	-0,088	0,301	0,619	-0,591	0,710	0,852	0,669	0,855	0,761	0,545	0,334	-0,228	0,006	1,000

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Promotionserklärung

Erklärung gemäß § 4 Abs. 1 Pkt. 3 PromO:

Hiermit erkläre ich,

1. dass mir die geltende Promotionsordnung bekannt ist;

2. dass ich die Dissertation selbst angefertigt und alle von mir benutzten Hilfsmittel und Quellen in meiner Arbeit angegeben habe;

3. dass ich bei der Auswahl und Auswertung des Materials sowie bei der Herstellung des Manuskriptes keine fremde Hilfe in Anspruch genommen habe;

4. dass ich nicht die Hilfe eines Promotionsberaters in Anspruch genommen habe und dass Dritte weder unmittelbar noch mittelbar geldwerte Leistungen von mir für Arbeiten erhalten haben, die im Zusammenhang mit dem Inhalt der vorgelegten Dissertation stehen;

5. dass ich die Dissertation noch nicht als Prüfungsarbeit für eine staatliche oder andere wissenschaftliche Prüfung eingereicht habe;

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