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SCHOOL OF GRADUATE STUDIES

TOURISM AND ECONOMIC GROWTH IN AFRICA:

A PANEL DATA APPROACH

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A thesis submitted to the School of Graduate Studies of Addis Ababa University in partial fulfillment of the requirements for the Degree of Master's of Science in Economics (Economic Policy Analysis)

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"TOURISM AND ECONOMIC GROWTH IN AFRICA: A PANEL DATA APPROACH"

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Acronyms

AR. ……Auto-Regressive

CPI…….Consumer Price Index

GDP……. Gross Domestic Product

GMM ……Generalized Method of Moments

GNP …….Gross National Product

HAC …….Heteroscedasticity- Autocorrelation-Consistent

ICLEI ……International Council for Local Environment Initiatives

IV……..Instrumental Variable

MA……....Moving Average

MCT……..Ministry of Culture and Tourism

NGO……. Non-Governmental Organizations

OECD…….. Organization for Economic Co-operation and Development

OLS…….. Ordinary Least Squares

POLS ……Pooled Ordinary Least Squares

PPT……Pro-Poor Tourism

TIM……. Tourism Income Multiplier

TSCS……... Time Series Cross-Section Analysis

UK……..... United Kingdom

UNWTO……...United Nations World Tourism Organization

USD……..United States Dollar ($)

VIF……Variance-inflating factor

WB……World Bank

WGI …….World Governance Indicators

WTO……World Tourism Organization

WTTC……World Tourism Organization and Earth Councile

Abstract

Tourism is an important source of foreign exchange earnings, income and employment, which, can contribute to poverty alleviation of African countries. The purpose of this study is to investigate the impact of tourism sector on economic growth and the vise versa. To achieve this objective a dynamic panel estimated by the systems generalized method of moment's estimator and pooled ordinary least squares are applied on forty two African countries for the period 1995-2005. This study will contribute to the limited empirical literature on the impact of tourism on economic growth and the vise versa in the region.

We found a significant positive contribution of the tourism sector for economic growth of the countries from the economic growth model. Similarly, the econometric results from the tourists` arrival model indicated that economic growth is vital for the development of the tourism sector. Hence, African countries should create conducive environment (e.g. political stability) and commit their resources to increase the contribution of the tourism industry to national income.

Key words: Tourism, Economic growth, Panel data, Africa.

CHAPTER ONE

INTRODUCTION

1.1. Background

Although tourism and travel have started since the history of mankind, the sector is emerged in a modern way quite recently. Human beings have been a confirmed traveler since antiquity- a nomad-as traveling has been a characteristics feature of human society and life style. Every human settlement has a long tradition of visits by traders and missionaries'. Travel in early times is synonymous with the modern day tourism. The practice and precept of tourism have passed through a long process and have primarily been an outcome of civilization and technological advancement, particularly in the fields of aviation and transport (Kamra and Chand, 2006).

In the modern way, tourism and travel are not identical. According to world tourism organization there are three criteria's used simultaneously in order to characterize a trip as belonging to tourism. In order for tourism to happen, there must be a displacement (an individual has to travel, using any means of transportation), type of purpose (the travel must occur for any purpose different from being remunerated from with in the place visited), and duration (the trip should be for a period not exceeding twelve months but not less than a day).

Currently tourism activity is becoming a common phenomenon in Africa since the continent has exceptional tourism resource endowments. Christie and Crompton (2001) describe Africa's potential for tourism as "exceptional", recognizing that "Africa has a lot to offer that can no longer be found elsewhere. Africa holds sympathy and certain romanticism as the continent of the explorers and as a place for adventurers. There are unique places, some of the greatest views in the world and natural attractions that few other regions can match. This is

true not only for its natural resources, but also for its culture, traditions, and customs" (cited in Naudé and Saayman, 2004).

For instance Ethiopia, one of the countries of Africa, is beautifully endowed with unique combination of natural and cultural heritages, suitable climate, rich flora and fauna and recognized archaeological sites such as Konso-Gardula, Afar and Soddo.

The tourism sector is regarded as a means of achieving development. Kamra and Chand (2006) expressed the sector as a milking cow, which can be flogged mercilessly. The most compelling reason for pursuing tourism as a development strategy is its alleged positive contribution to the local or national economy. Internationally, tourism represents an important source of foreign exchange earnings; indeed, it has been suggested that the potential contribution to the national balance of payments is the principal reason why governments support tourism development. Moreover, tourism is also considered to be an affective source of income and employment (Sharpley and Telfer, 2006).

Despite these benefits, the sector has some environmental, social and cultural negative impacts. However, for some individuals it is not tourism that has a negative effect, but poor tourism planning and ineffective management. Managed efficiently and effectively, tourism can definitely be far less destructive than the non-tourism industries while being no less earning (Kamra and Chand, 2006). That is, effectively and efficiently implemented tourism can potentially contribute to national or local economies especially for developing countries including Africa.

1.2. Statement of the Problem

Economic growth is the most powerful instrument for reducing poverty and improving the quality of life in developing countries. According to Romer economic growth occurs whenever people take resources and rearrange them in ways that are more valuable. Hence, it can generate virtuous circles of prosperity and opportunity. Strong growth and employment opportunities improve incentives for parents to invest in their children's education by sending them to school. This may lead to the emergence of a strong and growing group of entrepreneurs, which should generate pressure for improved governance. Strong economic growth therefore advances human development, which, in turn, promotes economic growth. The extent to which growth reduces poverty depends on the degree to which the poor participate in the growth process and share in its proceeds (David, 2007 and Ndulu, 2004).

When viewed against the success the world has had overall in reducing poverty over the last three decades, African poverty level is amazing. At the turn of the millennium, nearly half of the African population consumed less than US$1 a day, twice the average global rate of extreme poverty. While the world as a whole has made remarkable progress in reducing extreme poverty over the last three decades, reducing it by nearly two-thirds between 1970 and 1998, the trend in Sub-Saharan Africa has been in the opposite direction, doubling the proportion of the extreme poor over the same period. As a consequence, the share of the world's extreme poor living in Africa in 1998 had risen to 66% from 11% in 1960 (Sala-i-Martin, 2002 cited in Ndulu, 2004).

On the other hand Africa is well endowed with tourism resources that can play a vital role in poverty alleviation. However, the tourism potential of African countries is underutilized and undeveloped (Naudé and Saayman, 2004). In 2001, Africa has received about 27.7 million

international tourists and US$ 11.7 billion tourism total receipts. This boils down to 3.7 arrivals per 100 of population, which compares poorly with the world average of 11 and the 44 per 100 in Europe (WTO, 2002). During 2002, Africa attracted less than 4% of total international tourists, and received less than 2% of international tourist expenditure (Ibid).

Those small tourism receipts are concentrated only in small number of destinations, in the North West and South East of the continent. North Africa, with 35 % of the regional total, and Southern Africa, with 30 %, attracted two thirds of total arrivals in the region, while East Africa received 23 %, leaving only 10 % for West and 3 % for Central Africa (WTO, 2003).

Ethiopia is among the lowest tourism beneficiaries in the continent sharing only 0.58 % (180,000) of arrivals in 2003 (Tourism Statistical Bulletin, 2006). The country out performed only Eritrea, Sudan, and Congo in 2002 (Ministry of culture and tourism, 2003).

To assist policy makers in informed decision making on this sector, studying the link between the tourism sector and economic growth is appropriate, which is the leading objective of this thesis.

1.3. Significance of the Study

Economically well-performed countries have strong tourism sector. On the other hand, the development of the tourism sector would lead to economic growth and development through different directions. Thus, the urgent need for poverty assistance in Africa and the substantial potential economic contribution of tourism in the African economy justifies the interest in explaining the sector link with economic growth. Empirical studies on this field for Africa have shown little attention in examining the causal effect of the sector with economic growth, which is the motive to undertake this study. That is this research attempts to examine this

causal effect using a panel data approach. We believe that the findings from this work will assist policy makers to exploit the potential of the sector.

1.4. Objective of the Study

The major objective of this study is to examine the causal effect between the tourism sector and economic growth in African countries. Under this main objective the following specific objectives will be addressed.

- Examine the potential determinants of the tourism sector demand including economic growth as measured by GDP per capita.
- Examine the role of tourism on economic growth.
- Draw recommendations based on the empirical results.

1.5. Working Hypothesis and Research Question

1.5.1. Working Hypothesis

Based on empirical literature, the following hypothesizes are proposed:

- Tourism sector will have a significant positive contribution to the economic growth of African countries.
- Economic growth is also a relevant input for tourism sector development.

1.5.2. Research Question

- How relevant is the tourism sector for economic growth?
- How significant is economic growth for tourism sector expansion?

1.6. Organization of the Paper

The paper comprises five sections. Chapter one deals with the introduction part that includes background, problem statement, study significance, research objective, hypothesis, and research question. In chapter two the historical, theoretical, and empirical literatures are reviewed. Following model selection and method of estimation in chapter three data sources, variable description and descriptive statistics will be presented in chapter four. Empirical results will be discussed at the end of the chapter. The final chapter concludes and draws policy implications.

CHAPTER TWO

LITRATURE REVIEW

2.1. Historical Background

2.1.1. Definition

There is no universal definition of tourism. However, the definition given by the World Tourism Organization (WTO) acquired wider acceptance. According to the organization an international visitor is any person who travels to a country other than that in which s/he has his/her usual residence, but outside his/her usual environment for a period not exceeding twelve months and whose main purpose of visit is other than the exercise of an activity remunerated from within the country visited (Philip and Alastair, 2001).

Many authors agree that tourism is different from travel. In order for tourism to happen and characterize a trip as belonging to tourism the world tourism organization puts three criteria to be used simultaneously. It involves a displacement outside the usual environment, type of purpose: the travel must occur for any purpose different from being remunerated from within the place visited, and duration: the travel should be for a period not exceeding twelve months but not less than a day (Ibid).

2.1.2. Types of Tourism

Countries' tourism resources can be broadly classified into natural tourism resources such as flora, fauna, landscape, and lakes and non-natural tourism resources such as historical places, cultural heritages, museums, and handcrafts.

However, there are more than twenty tourism types, having great advantage to Africa. The most common tourism types of Africa are listed below.

- **Ecotourism**: this essentially is ecological tourism where ecology has both environmental and social connotations.
- **Heritage tourism:** this type of tourism involves visiting historical or industrial sites that may include old canals, railways, battlegrounds etc.
- **Cultural tourism**: the subset of tourism concerned with a country or regions culture, especially its arts is called cultural tourism. It includes tourism in urban areas, particularly historic or large sites and their cultural facilities such as museums and theater.
- **Agro tourism**: this is a style of vacation in which hospitality is offered on farms. This may include the opportunity to assist with farm tasks during the visit.
- **Adventure tourism:** the type of tourism involving travel to remote areas, where the traveler expects unexpected is adventure tourism. It is growing rapidly in popularity as tourists seek unusual holidays, different from the typical beach vacation.
- **Sex tourism:** the purpose of this tourism type is sexual activity.

From those and other types of tourism African countries has exceptional advantage. For instance Ethiopia is internationally known by cultural heritage, pilgrimages and other tourism types (http://en.wikipedia.org/wiki/tourism cited in Muluken, 2006).

However, it should be noted that some of the tourism types has a negative impact for the country of destination. A good example of this is sex tourism, which has a disastrous impact on the culture, economy and health of the society in the visited country. Undeveloped countries like Africa with inefficient or lack of tourism policies are the main victim of this.

2.2. Theoretical Literature

2.2.1. Economic Contribution of Tourism

Currently, the tourism sector is frequently justified on the bases of its potential contribution to economic growth and development. Specifically, it is widely assumed that tourism can help to eliminate the widening economic gap between developed and less developed countries and ensure the steady acceleration of economic and social development, in particular in developing countries (WTO, 1980 cited in Sharpley and Telfer, 2006).

Tourism accounts for more than twice as much as cash moving from rich to poor countries than governments give in aid. In 41 of the 50 poorest countries in the world, tourism constitutes over 5% of GDP and/or over 10% of exports (Ashley and Mitchell, 2005). Thereby the tourism sector is important to Africa for a number of reasons. First, even though Africa contributes little to global tourism figures, tourism contributes significantly to African economies. By 2003 tourism accounted for over 11% of total African exports – and 20% to 30% of exports for most countries that exceed the modest threshold of half a million foreign visitors a year. Second, African tourism is also growing fast. In 1980 tourism represented 2% of African exports of goods and services and now it is at nearly six times this level. Africa's global market share is increasing – a rare bit of good news for the continent's trade performance. The tourism sector is remarkably free of the price supports seen in agriculture and tariff controls of trade in manufactures. Third, tourism matters all across Africa. International arrivals are concentrated with South Africa, Egypt, Morocco, Tunisia and Mauritius, together receiving nearly three quarters of continental receipts. But tourism constitutes over 10% of total exports in more than half of African countries for which there is data. In countries such as Mali and Gambia, small annual international arrival figures of 70000 are significant and tourism contributes 10.1% and 30.5% of total exports for these

countries respectively. Fourth, success stories exist where African countries have graduated from Least Developed Country status from the platform of a strong tourism sector is evident – as evidenced by Mauritius and Botswana (Ashley and Mitchell, 2005).

Another excellence of tourism is its spillover effect on countries economic growth and development. The importance of tourism to a country's economy can be measured by looking at the proportion of national income created by tourism commonly known as tourism income multiplier (TIM). In an economy with a low proportion of leakages, such as low tax rates or low import levels, TIM will be high and tourism may in total contribute a great deal more income than that originally spent by the tourists them selves (Holloway, 1989).

2.2.2. Determinants of Tourism Demand

Tourism demand from the receiving country point of view can be defined as the set of goods and services that the visitors-residents and non residents- acquire during a specific period of time of their permanence (Proença and Soukiazis, 2005). Others (e.g. Song and Witt, 2000 cited in Proença and Soukiazis, 2005) define tourism demand as the amount of a set of tourist products that the consumers are willing to acquire during a specific period of time and under certain conditions that are controlled by the explanatory factors used in the demand equation.

In explaining tourism demand different explanatory factors are used by different professionals such as economists, sociologists, psychologists, and others. Economists view tourism as an economic activity, and thus recognize that tourism may be defined as possessing the characteristics of an industry. This view is inbuilt in defining tourism as the demand for and supply of accommodation and supportive services for those staying away from home, and the resultant patterns of expenditure, income creation and employment that are created (Ryan, 2006).

In conventional micro-economic theory, the demand for any product or service can be defined in terms of:

$$Dt = f(Pt, P1 \ldots . Pn, Y, T) \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (1)$$

where D_t = the demand for tourism

$P_1 \ldots . P_n$ = prices of other goods

P_t = the price of tourism

Y = income and T= taste

From economics perspective, economic factors such as higher levels of income, prices, and exchange rates are motivating factors for undertaking leisure. Specially, there is a significant link between income and motivation because any higher income removes some of the uncertainties of life, thereby freeing people from the need to continually concern themselves with need for shelter, warmth, and food. Instead, people can then seek to improve their lives not only with the material but also with the experiential, and travel becomes an important means of experiencing and engaging with the new. Hence, as income increases, so the demand for tourism is also likely to increase (Ryan, 2006).

The other factor that determines tourism demand is the price factor. The inclusion of the price variable in the tourism demand function results from some theoretical considerations. Tourism is consumption good and has its own price differentiated along different competing places of destination. Subject to his income constraint the household of a specific country has to decide first to consume tourist products or other type of consumption goods. After his decision made in favor of traveling he chooses the place to visit taking into account (among other factors) the overall cost of his journey, trying to maximize his utility. However, tourist

demand does not only depend on its own price but also on the price of other alternative goods and services as well as the general price level of the domestic market.

Here we have to distinguish two different situations: from the point of view of the sending country, the increase in domestic price level reduces the purchasing power of the potential travelers and, therefore, their demand for tourism; on the other hand, an increase in the price level of the destination country discourages tourists to move to this place or reallocate their demand to other cheaper competing places (Proença and Soukiazis, 2005). Moreover, other non-economic factors such as political instability, diseases, earth quack, and terrorism also influence the demand for tourism.

Sociologists argued that increase in leisure time permitted by, in the earlier part of the twentieth century, increments in paid holiday time and free weekends are important factors in increasing tourism demand. While for psychologists tourism is not a purchase of the physical, but a means by which the holidaymaker acquires experiences and fulfils dreams. It possesses the very essence of intangibility, for at the end of the holiday the purchaser has little in the way of physical possessions. Other authors' identify other motivating factors for travel. Those are relaxation, play, strengthening family bonds, prestige, social interaction, sexual opportunity, educational opportunity, self fulfillment, wish fulfillment, shopping etc (Ryan, 2006).

Cunha (2001) tries to broadly and comprehensively classify the potential determinants into: 1) socioeconomic factors such as income level, relative prices between the origin and the destination places, demography, urbanization and length of the leisure time; 2) technical factors related to easier communications and transport facilities; 3) psychological and cultural factors reflecting personal preferences and the style of life of the potential travelers; and 4)

random factors related to unexpected events, like political instability, weather conditions, natural disasters, epidemic diseases, etc.

Similarly, Eugenio-Martín et al. (2004), identify three main areas which policymakers need to be concerned: infrastructures, education and safety. The development of infrastructures (e.g. water, electricity, telephone and transportation facilities such as roads or public transport system) is vital in any tourism project. Furthermore, one can include other kind of tourist infrastructures that may help to promote tourism to the region.

For the potential employment of local people in the tourist activities education is another necessary condition. It usually requires knowledge concerning different sectors such as communication (languages), catering, hospitality, transportation, and management skills. Safety is also a highly appreciated feature in tourism resorts. Most of the tourists look for places to spend a nice and non-problematic stay. In this sense, one can argue that most of the tourists are risk averse. This is a very important issue to take into account when assessing the competitiveness of a tourist destination. Nevertheless, it seems that safety is related to per capita GDP and how it is distributed within the population.

The relationship of these three features with tourism growth seems to be non-linear (Eugenio-Martín et al., 2004). They are usually required to attain some critical threshold, above which investment becomes relatively inefficient.

The major problems that affects Africa's tourism include high airfares, poor infrastructure and facilities, insufficient air transport, a deficiency in facilities and accommodation, a lack of image and poor perceptions, poverty, disease and conflict (Naudé and Saayman, 2004; Kester, 2003 (cited in Naudé and Saayman; 2004); Christie and Crompton, 2001; Cleverdon, 2002). As far as communication facilities are concerned, the digital divide must be seen as an

important obstacle to tourism development in Africa. Only about 1.5 million of the world's more than 300 million internet users are in Africa (with more than 60% of these in South Africa alone) (Cleverdon, 2002 cited in Naudé and Saayman, 2004). The Internet plays an increasingly important role in tourism through marketing, information and online booking and electronic commerce and has significantly increased competition between tourist destinations (Christie and Crompton, 2001). It is also often noted that there are "neighborhood-effects" of instability in one country affecting perceptions of the region as a whole with "potential tourists often unable to distinguish between individual countries" (Kester, 2003 as cited in Naudé and Saayman, 2004). On the other hand, tourism seems to be sensitive to good economic growth and macro-economic stability (all which influence the price competitiveness of a country's tourism products). Accordingly, tourism is a significant industry in all five of Africa's good performing economies: Morocco, Mauritius, Tunisia, South Africa and Botswana (Gauci et al., 2002 cited in Naudé and Saayman, 2004).

With regard to tourism demand measurement there is no universally acceptable standard way. Various authors use different measures such as the number of foreign visitors crossing the borders; the number of nights spent by visitors from abroad; the receipts originated from the visitors spending; or the stay-length of tourists visiting a country. However, all are not satisfactory in entirely measuring the demand for tourism (Proença and Soukiazis, 2005).

Using the number of entrances to express tourism demand is not suitable and complete, which ignores the stay–duration, and spending behavior. Cunha (2001) argued that the number of entrances is not a good approximation to express tourism demand since it ignores one of the most important aspects in this sector: the demand of goods and services that tourists require during their permanence.

Hence, it is possible to observe an increase in the tourism inflow accompanied by a reduction in spending explained by higher domestic inflation and shorter length of stay. For this reason the expenditure approach is preferable to the inflows approach to study the demand for tourism behavior from the point of view of the hosting country (Mello and Sinclair, 2002, cited in Proença and Soukiazis, 2005).

2.2.3. Tourism Policy and Strategies

Recent works indicate that tourism in Africa can, in the right circumstances, contribute effectively to economic growth and development. Although the sector is blamed for some destructive effects, many authors give poor management of the sector as an excuse. According to them it is not tourism that has a negative effect, it is poor tourism planning and in effective management that does it (Kamra and Chand, 2006). Managed efficiently and effectively, tourism can definitely be far less destructive than the non-tourism industries while being no less earning. This is to say the sector should operate under well-designed and effective tourism policy.

Policy development can be seen as a decision making process that helps address identified goals, problems or concerns. Further more, any given policy represents the end result of a decision as to how best to achieve a specific objective (Torjman, 2005). According to Swiss tourism policy as an aspect of economic policy is neither industrial policy nor sectorial policy (OECD, 2000).

Globally, academic research in tourism does not become wide spread until the 1990s, and there is still little in-depth analysis of tourism policies in many countries. It is quite recently that tourism public policy has become a high priority of governments in developed and less developed countries (Hall and Jenkins, 2004). According to the authors it is the involvement

of governments and the perceived negative impacts of tourism in developing countries helped bring about an increase of activity in tourism policy analysis especially in the late 1980s and 1990s.

In 1996 the World Tourism Organization and the Earth Council (WTTC) joined together to launch an action plan entitled "Agenda 21 for the Travel and Tourism Industry: Towards Environmentally Sustainable Development" – a sectional sustainable development program based on the results of the Rio Earth Summit in 1992. Since the launch of the document, the three organizations have begun a series of regional seminars to increase awareness of the conclusions, and to adapt the program for local implementation. Further more, WTTC has recently introduced a major addition to the program – the "Alliance for Sustainable Tourism", which invites public and private sector travel and tourism organizations to record their Agenda 21 based activities on a central web site and commit to co-operation with all other partners. In order to develop the program from global principles to community based action, WTTC is also discussing with the International Council for Local Environment Initiatives (ICLEI) on how the principles of "Agenda 21 for Travel and Tourism" can be built into Local Agenda 21 programs (World Travel and Tourism Organization and International Hotel and Restaurant Association, 1999).

Government has great role in formulating the incentives and regulatory frame works that will ensure economic, environmental, and cultural sustainability, poverty alleviation and social inclusion (Christie and Elizabeth, 2001). Accordingly, many authors recommend African governments to be smart in designing tourism policies compatible with their economic situation.

Dieke (2003) argued that the traditional role of government is to formulate policy for the tourism sector. Today the focus has changed because of changing priorities occasioned by development in the international tourism scene (e.g. the emergence of consumer interests). The challenge for national governments is to formulate tourism sector policies that best reflect the new thinking. Some important areas needing policy re-orientation or refocusing are consultation with local communities in the planning process; forming partnership with the private sector; liberal immigration regulations to facilitate free tourist movement; tourism infrastructure development policy to facilitate tourism development, for the benefit not just for tourism but the wider society. The last policy issue needs to be linked to devising feasible and sensible options for financing tourism infrastructure. Other aspects of policy refocusing include entrepreneurial development initiative policies to enhance tourist length of stay. The policy to identify ways in which the benefits from tourism activity can be spread more evenly throughout the society should also be concerned.

Many scholars argue that most African governments hope that tourism will contribute to national economic growth and to local development in marginalized areas. They want to promote the involvement of local people and disadvantaged communities in the tourism industry (so called 'community tourism.'), but often don't know how they make mistakes. Governments have a crucial role to play. What communities do in tourism depends on the opportunities and power they have, the incentives and prices they face, and their access to skills, training, capital and markets. And all of these are shaped by government policies, regulation and taxes.

Despite their beautiful endowment with unique combination of natural and cultural heritages, suitable climate, rich flora and fauna and recognized archaeological sites many African countries do not have tourism policy. For instance Ethiopia despite its exceptional tourism

resource does not have tourism policy at all. Consequently the adverse impact of it might not be negligible. This might directly or indirectly linked with un-development and under-operation of the sector and the economy in general.

2.3. Empirical Literature Review

Tourism is viewed as an engine for economic growth and there are many researches that focus on the area. However, little has been done in developing countries especially in Africa. The limited studies were focused mainly on analyzing determinants of tourist arrivals in the continent, challenges and opportunities, and its economic contribution. In the following paragraphs some of the major empirical works will be presented.

Sequeira and Campos (2005) conducted a research on international tourism and economic growth. They applied a panel data estimation technique using five-year dataset and used a large panel of countries and also sub-samples of countries specialized in tourism. To test the significance of tourism to economic growth they have used different variables such as tourism specialization (measured as a percentage of GDP, exports and population proportion), lagged real gross domestic product per capita, human capital (proxed by secondary male enrolment), government consumption-output ratio, and exports plus imports to output ratio (openness). They concluded that tourism; on its own cannot explain the higher growth rates of the tourism specialized countries, which is contrary to most previous works, as they said. However, in their sub-samples of countries specialized in tourism, the signs and significance of tourism estimators was worth noting (in countries such as Africa and Latin America), in which countries were supposed to have comparative advantage in tourism. This is in line with the argument that tourism is important to promote the development of poor countries with a comparative advantage in tourism. A dynamic panel data and instrumental variables

estimator's application to the relationship between tourism and economic growth, allowing for a greater variety of time-series effects was their suggestion for future research.

Eugenio-Martin et al. (2004) using panel data estimation they examined the relationship between tourism and economic growth in Latin American countries. Using rate of growth of tourists per capita, gross domestic investment, public spending on education, general government consumption and social variables (corruption and political stability) as controlled variable of the economic growth model and gross domestic fixed investment, price calculated as the ratio between the official exchange rate and purchasing power parity conversion factor (PPP), Public spending on education per capita, school enrollment (secondary and tertiary), life expectancy at birth and trade openness as controlled variable of the tourists` arrival model, they conclude that the increasing number of tourists per capita caused more economic growth in the low and medium-income countries of Latin America, but not contribute to economic growth in richer countries. On the other direction of the causality they suggest that in order for low-income countries to benefit from tourism they need to have adequate infrastructures, education, and development to attract tourists. Medium income countries need high levels of health services and high GDP per capita. .

Proença and Soukiazis (2005) analyzed the demand for tourism in Portugal using panel data econometric methods. In the demand function they introduce both the demand factors and the supply factors. The variables used to explain the tourism spending of the host country are real per capita income of the sending country, relative price between the host and sending countries, accommodation capacity in the host country, public investment ratio in the host country. Their results revealed that per capita income is the most important demand determinant and accommodation capacity the most important supply determinant explaining the tourism movement in Portugal.

Naudé and Saayman (2004) conducted a research on the determinants of tourist arrivals in 43 African countries using five years dataset (1996- 2000). Number of internet users, index of political stability, number of frost days on average per annum, air distance, number of telephone lines per employee, prevalence of malaria, total number of tourist arrivals, number of hotel rooms available, death rate, GDP per capita, life expectancy, urbanization rate, average hotel room price, adjusted consumer price index were the main variables of the study. They found that political stability, tourism infrastructure, marketing and information, and the level of development in the destination are key determinants of travel to Africa. They also point out that typical "developed country determinants" of tourism demand, such as the level of income in the origin country, the relative prices and the cost of travel, are not that significant in explaining the demand for Africa as a tourism destination.

Bichaka et al. (2007) were studied the impact of tourism on economic growth and development in 42 African countries using panel data. They found that receipts from the tourism industry significantly contribute both to the current level of gross domestic product and the economic growth of Sub-Saharan African countries, as do investments in physical and human capital. They conclude as African economies could enhance their short-run economic growth by strategically strengthening their tourism industries.

Ashley (2000) assessed the impact that tourism has on rural livelihoods based upon Namibia's Experience. By assessing a range of livelihood impacts, identifying how sectoral policies can be adjusted to enhance impacts, and showing how tourism's contribution to livelihoods can be enhanced by adjusting decisions, the research has implications for how tourism planners, other policy-makers, communities, businesses and non-governmental organizations (NGOs) work. Based on the country's experience he finally concluded that the development impact of

tourism as 'jobs and cash' is an over-simplification. Local people have complex livelihood strategies, and different people have different livelihood priorities.

Spenceley and Seif (2003) conducted a research on strategies, impacts and costs of pro-poor tourism approaches in South Africa. This paper describes strategies devised by five private sector tourism enterprises in South Africa to address poverty and development issues in neighboring communities. The authors focused on both economic and non-economic impacts of the sector. Further more, they evaluate the impact that pro-poor tourism (PPT) strategies have on the livelihoods of the rural poor. The research output supports a number of critical issues such as market access (strength of existing economic elites and location of poor people), commercial sustainability (attractiveness and quality of product, marketing and cost benefit), policy framework (land tenure and government attitudes) and implementation issues (skills and capacity gap, communication and collaboration and meeting expectations). They concluded that the most significant benefits to the poor clearly arise from direct employment within the tourism industry.

Luvanga and Shitundu (2003) examined impact of tourism on poverty alleviation in three tourist areas of Tanzania. They concluded that tourism has high potential for poverty alleviation. However, they noted that there are policy issues that need to be addressed for the sector's effective contribution towards that goal.

World Bank (2006) conducted a research for the government of Ethiopia entitled by Ethiopia: Towards a Strategy for Pro-Poor Tourism Development. By collecting quantitative data on tourism-centric locations (such as Lalibela, Bahir-Dar, Gondar, Axum, Harar, Arba-Minch, and Addis Ababa), the organization tries to conduct a comprehensive work in the country. Under the objective of responding to the Government of Ethiopia request to define a strategy

for tourism growth that is commensurate with its vision for tourism, they report that the industry is under-performing relative to the tremendous potential value of its cultural heritage as an anchor for a tourism industry. According to them this is attributed to weaknesses in Ethiopia's image, market presence and penetration resulting in a demonstrable weak demand for its products; a severely under-valued cultural and natural resource base; uncompetitive supplier and support services (hotels, transporters, activity providers, restaurants, handicraft manufacturers and distributors, banks, telecom and emergency health services); and finally the absence of an efficiently coordinating and communicating governance framework to guide and integrate the many stakeholders at both the national and sub-national levels.

CHAPTER THREE

MODEL SELECTION AND METHOD OF ESTIMATION

3.1. Model Selection and Specification

In this paper, two different models are considered: economic growth model and tourists arrival model. The economic growth model tries to explain economic growth (as measured by the rate of per capita GDP) depending on the number of tourists that visit the region given a set of covariates X . The specification of the model is based on Barro (1991) seminal work as it allows us to introduce the concept of conditional convergence. That is, to check if Africa's poorer countries "catch-up" to richer African countries over time[1].

The tourist arrival model attempts to understand the opposite relationship, i.e. to what extent is tourism growth explained by the rate of per capita GDP together with other potential determinants of tourism.

3.1.1. Economic Growth Modeling

The rate of growth of gross domestic product (GDP) reflects the gain or loss of wealth in a country.

Assuming that y_{it} denote per capita income or output, the growth rate can be written as

$$y_{it} - y_{it-1} = \alpha + \beta y_{it-1} + \upsilon_{it} \quad \ldots\ldots\ldots\ldots\ldots\ldots \quad (1)$$

where, α is the steady state, υ_{it} error term and $-1 < \beta < 0$, implies the existence of convergence between countries (β-convergence).

[1] The neoclassical growth model assumes convergence conditional on all countries having the same steady state, i.e. the same technology, same savings rate and same population growth rate.

In conditional convergence models a range of variables are used as proxies for the different steady states which include, population, human and physical capital, technology, fiscal and monetary indicators, political stability, income distribution, openness to international trade and development of the financial system (Eugenio-Martin et al., 2004). Furthermore, number of tourists can be included to control the effect of growth of tourists on steady state.

Including those potential variables equation (1) can be rewritten as:

$$y_{it} - y_{it-1} = \alpha + \beta y_{it-1} + \gamma x_{it-1} + \upsilon_{it} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (2)$$

where, x_{it} is the vector of determinants of the steady state per capita income (output).

Unobserved time and country specific variables may affect the contribution of tourism to economic growth and/or the vise versa.

Equation (2) augmented by unobserved variables can be specified as follow:

$$y_{it-}y_{it-1} = \alpha + \beta y_{it-1} + \gamma x_{it-1} + \alpha_i + \eta_t + \upsilon_{it} \ldots\ldots\ldots\ldots\ldots\ldots (3)$$

This equation can be rewritten as:

$$y_{it} = \alpha + (1+\beta) y_{it-1} + \gamma x_{it-1} + \alpha_i + \eta_t + \upsilon_{it} \ldots\ldots\ldots\ldots\ldots\ldots (4)$$

where α_i and η_t are respectively individual and temporal effects which influence the steady state of each country. However, the availability of panel data may help to eliminate country and time specific effects by subtracting the average value of each variable from the corresponding level variable.

Following the above econometric model our estimated equation is

$$LGDPpc_{it} = c + (1+\beta) LGDPpc_{it-1} + \gamma_1 TRARV_{it} + \gamma_2 GDI_{it} + \gamma_3 PSE_{it} + \gamma_4 GGC_{it}$$
$$+\gamma_5 D_{it} + \gamma_6 F_{it} + \gamma_7 PPN_{it} + \gamma_8 FED_{it} + \gamma_9 LEB_{it} + \gamma_{10} TOP + \gamma_{11} PD + \varepsilon_{it}$$

$t = 1,...,100(1995-2005),\ i = 1,...,42$ and $\varepsilon_{it} \sim N(0, \sigma_i^2)$

where $LGDPpc_{it}$ denotes per capita of gross domestic product (in log form); $TRARV_{it}$ refers to the number of international tourists arrivals; GDI_{it} represents gross domestic investment as % of GDP; GGC_{it} is general government consumption as % of GDP; PSE_{it} indicates public spending on education as % of GDP; D_{it} is political stability; F_{it} refers to quality of governance (corruption); LEB_{it} is life expectancy at birth; TOP_{it} is trade openness; FED_{it} is financial sector development; PD refers to time trend; and PPN_{it} denotes population.

3.1.2. Tourists Arrivals Modeling

In the tourism literature forecasting of international tourists arrivals is the issue that economists paid more attention. In this context, most of the literatures considered price of the destination and income of the tourists as the most relevant variables in determining tourist's arrivals. However, tourists' choice of destination depends on some other factors too. Hence, the tourists` arrival is modeled considering four main features of the destination: *price*, in terms of consumer price index and exchange rate; *investment and infrastructures*, which includes aspects such as roads, hospitals or home utilities; *safety,* variables as political stability or income per capita and *education*.

The estimated equation is –

$$TRpc_{it} = c + \gamma_1 GDPpc_{it} + \gamma_2 P_{it} + \gamma_3 D_{it} + \gamma_4 d_1 + \gamma_5 LSEC_{it} + \gamma_6 LTER_{it} + \gamma_7 TROP_{it} + \gamma_8 FED_{it} + \gamma_9 PD_t + \gamma_{10} PSE + \gamma_{11} GDI_{it} + \gamma_{12} PPN_{it} + \varepsilon_{it}$$

$t = 1,...,100(1995-2005),$ and $i = 1,...,42$

Where $TRpc_{it}$ refers to international tourism per capita; $GDIpc_{it}$ denotes gross domestic investment as % of GDP; $GDPpc_{it}$ represents gross domestic product per capita; P_{it} is for

price; $PSEpc_{it}$ denotes public spending on education per capita as % of GDP; $LSEC_{it}$ represents log of secondary school gross enrollment; $LTER_{it}$ is for log of tertiary school gross enrollment; $TROP_{it}$ refer to tourism openness; D_{it} represents political stability; FED_{it} denotes financial sector development; d_1 is a dummy variable used to capture country specific differences. The countries are classified based on gross national product (GNP) per capita of world development indicators (WDI) classification criteria where countries with less than US$ 875 GNP per capita are grouped as lower income countries and countries with GNP per capita between (875 – 3465) and (3465- 10725) US$ are grouped as lower middle and upper middle income; PD_t refers to period; and PPN_{it} denotes population.

3.2. Estimation Technique

Much of the recent literatures in macroeconomics used panel data models. Panel regression models are based on panel data, which contains repeated observations on the same cross-sectional or individual units over several time periods.

Panel dataset has several advantages over a single time series and/or cross-section data set. First, panel data can control for heterogeneity among individual units, countries in this case. Second, panel data give more informative data, more variability, less co-linearity among variables, more degrees of freedom and more efficiency by combining time series of cross-section observations. Third, panel data allows economists to study dynamics of adjustment, and to specify and estimate more complicated and realistic models than a single cross-section or a single time series would do (Verbeek, 2000; Gujarati, 2004; Baltagi, 1995).

For countries like in Africa that suffered from data shortage, pooling data from different countries provide more variability and enables to identify and measure the effects that are not simply detectable in pure cross section and pure time series data.

3.2.1. Generalized Method of Moments (GMM)

Among the major advantages of panel data is its ability to model individual dynamics. Consider a dynamic model with exogenous variables and a lagged dependent variable

$$y_{it} = x_{it}\beta + \gamma y_{it-1} + \alpha_i + \varepsilon_{it} \ldots\ldots\ldots\ldots\ldots\ldots(5)$$

In a dynamic model y_{it-1} will depend upon α_i (individual heterogeneity), irrespective of the way we treat α_i. Hence, the usual least squares methods do not lead to consistent estimates for the parameters of the fixed effects and random affects models. In addition, the disturbance terms are serially correlated in those models, which cause the lagged endogenous variable to be correlated with the disturbance terms (Verbeek, 2000). This is a common problem in estimating growth regressions. That is, one variable that should be included in a conditional convergence regression, the initial level of efficiency, is not observed, hence the least squares parameter estimates will be biased due to the correlation of the omitted variable with one of the regressors, initial income level (Bun and Windmeijer, 2007).

With a good choice of instruments of orthogonal conditions, instrumental variables estimators and their various generalizations can be worked out for any kind of models such as models with more than one lag in the dependent variable or possible correlations between exogenous variables and specific effects.

In economic growth analysis, the generalized method of moments (GMM) estimation method has important advantages over simple cross-section regressions and other estimation methods for dynamic panel data models. First, estimates will no longer be biased by any omitted variables that are constant over time (unobserved country-specific or fixed effects). That is, in conditional convergence regressions, this avoids the problem raised by the omission of initial efficiency. Second, the use of instrumental variables allows parameters to be estimated consistently in models that include endogenous right hand side variables. In addition, the use of instruments potentially allows consistence estimation even in the presence of measurement error (Eugenio-Martin et al. 2004; Trognon and Seretre, 1996; Greene, 2003).

In first differenced GMM, systems of equations are estimated both in first differences and levels, when the instruments used in the level equations are lagged first differences of the series. However, the first-differenced GMM estimators for empirical growth models are seriously biased. When the time series are persistence and the number of time series observations is small, the first differenced GMM estimator is poorly behaved. This is because the lagged levels of the variables are only week instruments for subsequent first differences. If the instruments are weak predictors of the endogenous changes, weak instrumental variables cause large finite sample biases[2]. That is, the estimator can have very poor finite sample properties in terms of bias and precision (Ibid).

Bond et al. 2001 suggests two possible solutions to the above econometric problems.

a) To use the system GMM estimator developed by Arellano and Bover (1995).
b) To strengthen the instrument set used for the equations in first-differences by using other variables those are not included in the model.

[2] If instrumental variables are poorly correlated with the explanatory variable, however, then the instruments are said to be weak. Weak instruments give regression estimates that are biased and inconsistent.

However, strengthening the instrument set with outside instruments is usually not an easy job; as a result the system GMM estimator may be preferable.

When it comes to the system GMM estimation[3], it exploits an assumption about the initial conditions to obtain moment conditions that remain informative even for persistence series. Blundell and Bond (1998) argued that the system GMM estimator performs better than the differenced GMM estimator because the instruments in the level model remain good predictors for the endogenous variables in this model even when the series are very persistence.

The system GMM estimator exploits two sets of moment restrictions,

A. $E(y_{i,t-s}\Delta\varepsilon_{it}) = 0$ for $t = 3...T$ and $s \geq 2$

B. $E(\varepsilon_{it}\Delta y_{i,t-1}) = 0$ for $i = 1...N$ and $t = 3,4...T$

Blundell and Bond (1998) also consider additional assumption that

$E(\alpha_i \Delta y_{i2)} = 0$ for $i = 1...N$

Where

y_i is the levels of the dependent variable

α_i is the unobserved country-specific effect.

ε_i is the error term

Hence, even though the levels of the dependent variable (y_{it}) are necessarily correlated with the individual specific effects (α_i) the first differences (Δy_{it}) are not correlated with the

[3] Arellano and Bover (1995) construct a panel data GMM estimator in which the regression equations are in levels, and the additional instruments are expressed in lagged differences. Blundell and Bond (1998) augment the original differences GMM estimator with the level-equation estimator to form a system of equations known as 'system GMM'.

individual specific effects, permitting the use of lagged first differences of the series as instruments for equations in levels (Bond et al. 2001).

In this paper, the system GMM is adopted since it performs well compared to the differenced GMM estimator in terms of sample bias and precision.

Bond et al. 2001 in their Monte Carlo simulation study suggests the supremacy of the one-step system GMM estimators over the two-step system GMM estimators. They have shown that although the two-step estimator is more efficient than the one-step system GMM estimators, the efficiency gain is typically small, and that the two-step GMM estimator has the disadvantage of converging to its asymptotic distribution relatively slowly.

In finite and moderate sample sizes, the asymptotic standard errors associated with the two-step GMM estimators can be seriously biased downwards, and thus form an unreliable guide for inference. Jung (2005) argued that in practice we often rely on the one-step estimator, which is much more reliable than the two-step estimator. Hence, the one-step system GMM estimators, with standard errors that are not only asymptotically robust to heteroskedasticity but have also been found to be more reliable for finite sample inference are preferred for this analysis.

This estimator uses lags as instruments under the assumption of white noise errors. Hence, it loses its consistency if in fact the disturbances are auto-correlated. It is therefore essential to confirm that the errors are not serially correlated. The t-test, which utilizes consistently estimated residuals based on instrumental variable (IV) estimation that uses the lags of exogenous variable as instruments for the lagged dependent variables, is increasingly popular.

The residual-based GMM t-test that is applicable to dynamic panel data models with serially correlated errors, have two interesting points:

a) The t-test depends only on the consistency of the first-step estimation, not on its efficiency.
b) And the test is applicable to both forms of serial correlation (i.e. AR (1) or MA (1)).

If the null hypothesis is confirmed statistically (that is, not rejected), it implies the fact that the disturbances are not auto-correlated.

Another vital assumption for the validity of GMM estimates is that the instruments are exogenous. If the estimation is exactly identified, detection of invalid instruments is impossible. Conversely, if the system is over identified, a test statistic for the joint validity of the moment conditions falls naturally out of the GMM framework. This is commonly tested using the conventional GMM test of over identifying restrictions associated with Sargan, 1958 (cited in Bowshe, 2000; Roodman, 2006).

The Sargan test is a test of the validity of instrumental variables or a test of the over-identifying restrictions. The hypothesis being tested with the Sargan test is that the instrumental variables are uncorrelated to some set of residuals, and therefore they are acceptable, healthy, instruments. If the null hypothesis is confirmed statistically (that is, not rejected), the instruments pass the test; that is the test gives support to the model.

3.2.2. Pooled OLS Estimator (POLS)

In the second model a pooled OLS estimator (POLS) is applied. Pooled analysis combines time series for several cross-sections. Hence, pooled data are characterized by having repeated observations on fixed units. Estimating this kind of model solves many problems of traditional methods of the comparative research (i.e. time series analysis and cross-sectional analysis) as discussed in section 3.2 (Podestà, 2000; Gujarati, 2004).

However, pooled time series cross-section (TSCS) designs often violate the standard ordinary least squares (OLS) assumptions about the error process. This is because the errors for regression for OLS to be optimal it is necessary that all the errors have the same variance (homoschedasticity) and that all of the errors are independent of each other. Errors tend to be not independent from a period to the next and errors tend to be heteroschesdastic, such that they may have differing variances across ranges or sub sets of countries. Hence, pooled OLS estimator (POLS) is appropriate where there is contemporaneous exogeneity, no perfect co linearity, homoskedasticity and no serial correlation. To handle the problems of heteroscedasticity and autocorrelation (problems that plague cross-sectional and time series data) the Newey–West[4] method of correcting the OLS standard errors are employed[5].

[4] In large samples Newey–West procedure is valid which correct OLS standard errors not only in situations of autocorrelation but also in cases of heteroscedasticity.

[5] The corrected standard errors are known as HAC (heteroscedasticity- and autocorrelation-consistent) standard errors or simply as Newey–West standard errors.

CHAPTER- FOUR

DATA ANALYSIS AND DISCUSSION OF ESTIMATION RESULTS

4.1 Data Sources and Variable Description

4.1.1. The Data

The data for this paper come from different sources such as from world development indicators, world tourism organizations, Africa development indicators, and the worldwide governance indicators.

Macroeconomic variables such as GDP per capita, general government consumption and trade openness are collected from the world development indicators (World Bank, 2007). All except GDP per capita (expressed in 2000 US$ constant prices) are expressed as percentages. Life expectancy and price variables are also extracted from the same source. For education variables (secondary gross enrollment rate, tertiary gross enrollment rate and public expenditure on education), the World Bank group education statistics (edstats) data query 2007 has used. Gross domestic investment is obtained from the Africa development indicators produced by the World Bank version 2006. The social variables (political stability and corruption) on the other hand are extracted from the worldwide governance indicators (WGI) 2007. Finally, the data on tourist arrival is collected from the world tourism organization (WTO).

Based on data availability a sample of 42 African countries is selected. The series runs from 1995 to 2005[6]. Hence, a panel of 462 observations is compiled.

[6] Tourism data is available only since 1995.

4.1.2. Variable Description and Expected Sign

4.1.2.1 Variable Description

To examine the link between tourism and economic growth in Africa, the study utilizes different social and macro-economic variables as described above in section 3.1.1 and 3.1.2.

The most used macro-economic indicator for measuring out put, gross domestic product **(GDP),** is measured in logarithm and per capita terms. Gross domestic product refers to the sum of the gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation. Gross domestic product divided by midyear population gives us gross domestic product per capita (GDPpc).

GDI represents gross domestic investment as % of GDP. This investment includes expenditures on additions to the fixed assets of the economy plus net changes in the level of inventories. Fixed assets include land improvements (fences, ditches, drains, and so on); plant, machinery, and equipment purchases; and the construction of roads, railways, and the like, including schools, offices, hospitals, private residential dwellings, and commercial and industrial buildings. Inventories are stocks of goods held by firms to meet temporary or unexpected fluctuations in production or sales, and "work in progress."

GGC refers to general government consumption as % of GDP. This government expenditure includes all current expenditures for purchases of goods and services (including compensation of employees). Additionally, it includes most expenditure on national defense and security, but excludes government military expenditures that are part of government capital formation.

PSE denotes public spending on education. This is measured as percentage of gross domestic product to show the proportion of the government expenditure on education. School enrollment, secondary (SEC): gross enrollment ratio is the ratio of total enrollment, regardless of age, to the population of the age group that officially corresponds to the level of education shown.

School enrollment, tertiary (TER): same as before though taking into account that tertiary education, whether or not to an advanced research qualification, normally requires, as a minimum condition of admission, the successful completion of education at the secondary level. Life expectancy at birth (LEB): it implies the number of years a newborn infant would live if prevailing patterns of mortality at the time of its birth were to stay the same throughout its life.

Trade openness (TO): measured as the sum of merchandise exports and imports measured in current U.S. dollars divided by the value of GDP multiplied by 100. Tourism openness (TROP): it is calculated as the sum of tourism receipts and tourism expenditures divided by gross domestic product of a country multiplied by 100.

Price (P): it is a proxy for relative tourism prices. It is measured as the consumer price index (CPI) of a destination country adjusted by the $-exchange rate. This measure of relative prices captures changes in the real exchange rate over time as well as cross sectional variation in the cost of travel. The inverse of this shows how many “baskets” of goods a tourist has to give up in his home country in order to buy a basket of goods in the destination country (Eilat and Einav, 2003 cited in Naudé and Saayman, 2004).

PPN and TRARV refer to the total number of population of a country and tourists arrivals respectively. Following the definition of world tourism organization an international tourist is

any person who travels to a country other than that in which s/he has his/her usual resident, but out side his/her usual environment for a period not exceeding twelve months and whose main purpose of visit is other than the exercise of an activity remunerated from with in the country visited. The number of international tourists arrivals divided by population total gives us tourists per capita (TR_{PC}).

Political stability and corruption are the social variables used in the analysis. According to Kaufmann et al. (2006) political stability refers to the sensitivity of the probability that the government will be destabilized or defeated by unconstitutional or violent means, including political violence and terrorism. Similarly corruption is defined as the extent to which public power is exercised for private gain. Both social variables are expressed in their score values ranging from -2.5 to 2.5. Countries with less value are taken as politically unstable and highly corrupted countries while countries with high values are taken as politically stable and less corrupted countries.

Financial sector development (FED) is measured by money and quasi money (M2) as per centage of gross domestic product (GDP).

4.1.2.2 Variables expected sign

From the proposed model, the following theoretical signs are expected:

A. From the Economic growth model

- Tourism is an affective source of foreign exchange earnings, income and employment. According to World Tourism Organization (WTO) 1980 cited in Sharpley and Telfer, 2006 it is widely assumed that tourism can help to eliminate the widening economic gap between developed and less-developed countries and ensure the steady acceleration of economic and social development, in particular in developing countries. Hence, a positive sign is expected

in TRARV i.e. an increase in the number of tourists increases the rate of growth in an economy.

- The existence of convergence among the developed countries has been the area of interest for many empirical growth literatures. In 1996 David and Brandl investigates the existence of convergence in Africa and found statistically significant regional convergence clubs in Africa. The some result is expected in this study. That is the sign in LGDPpc is expected to be positive and less than one.
- Investment on human capital is one way of enhancing economic growth. Because, it has significant impact on their productivity and efficiency to grow rapidly. Hence, PSE is expected to have a positive sign. Similarly, a positive sign is expected in GDI since a larger rate of savings will result in faster growth.
- Government consumption (GGC) is defined as non-productive expenditure. Due to the opportunity cost of capital this negatively affects economic growth. For this reason, the sign of GGC is expected to be negative.
- There is high debate on the link between high population growth and economic growth. Optimists argued that population is relevant input for economic growth. On the other hand it is an evil for economic growth for pessimists. Empirical results found different results for different economies and countries. Although, population might have positive contribution for developed economies with adequate capital, its impact is negative for developing countries like Africa. Tsega 2005 found a negative relationship between the variables for Ethiopia. The sign expected in this study is also similar.
- An economy with a lack of financial institutions suffers from a low savings rate and low level of investment. This results in slow or no economic growth. Hence, FED is expected to have a positive sign.

- A positive sign is expected in TO because more open economies are more competitive and efficient to grow rapidly. Similar sign is expected in LEB.
- Corruption is an evil for economic growth of countries particularly by discouraging foreign direct investment and challenging the efficiency, equity and institutional function of the government. "Corruption hampers economic growth, burdens the poor disproportionately, and undermines the effectiveness of investment and aid," (World bank, 1999). The impact of political instability on economic growth is also related. The relationship between economic growth and social variables **(**D and F**)** is expected to be positive and negative respectively.

B. From the tourist's arrivals model

From the tourist's arrivals model, the following theoretical signs are expected:

- Tourism seems to be sensitive to good economic growth and macro-economic stability. According to Gauci et al. (2002) cited in Naudé and Saayman, (2004) tourism is a significant industry in all five of Africa's good performing economies: Morocco, Mauritius, Tunisia, South Africa and Botswana which implies importance of economic growth for good tourism performance. In line to this the sign of GDP per capita is expected to be positive.
- Following the low of demand high price is followed by low demand hence a negative sign is expected in P**.**
- Political stability is undoubtedly basic requirement for a successful tourism industry. Many African countries have been affected by Political instability, wars, and ethnic violence, which disrupt their tourism industry. Thus, a positive relationship between tourism per capita and the social variable D is expected, **s**ince a more politically stable country will have good tourism performance.

- Large increase in population is mean high sea pollution and strong challenge for the sustainability of tourist attraction areas. This effect is significant in developing countries as Africa where the necessary infrastructure for handling these damages is not available. As a result the population variable is expected to have a negative sign.
- A positive sign is expected in TROP because countries restrictive policies are counter-productive to tourism. When they open their doors for tourists and have visa-free entry program, definitely tourist arrival boosted. That is high openness endorses tourism growth.
- Eugenio-Martín et al., 2004 identify three main areas that policymakers need to be concerned: infrastructures, education and safety. According to them education is necessary condition for potential employment of local people in the tourist activities. Because it usually requires knowledge concerning different sectors such as communication (languages), catering, hospitality, transportation, and management skills. Hence, the signs expected from LSEC, LTER, and PSE are positive.
- Tourists give value for high quality services given in the financial sector of destination countries. Hence, the financial sector development (FED) variable is expected to have a positive sign. Similarly, a larger rate of savings will result in good tourism performance, which makes GDI to have a positive sign.

4.2 Descriptive analysis

The mean GDP per capita of the sampled countries is US$ 943.8. However, the per capita GDP of the region exhibit strong heterogeneity among the sampled countries (Table 4.2). This is confirmed by the large standard deviation and significant growth rate difference among the countries sampled. Countries like Seychelles, Gabon and Mauritius are relatively the three top countries with mean per capita GDP of 6907.9, 3983.2 and 3743.9 USD respectively. On the other hand, Ethiopia, Burundi and Democratic Republic Congo (DRC), have the lowest GDP

per capita of 123.1, 110.9, and 94.9 US$ respectively. The growth rate of countries like Botswana, Angola and Chad is positive 6.1, 5.6 and 4.7 per cent respectively. On the other side, Burundi, DRC and Zimbabwe registered negative growth rate -1.6, -2.3 and -3.2 percent respectively. However, the mean growth of the region is 1.4 per cent.

Table 4.2.1: GDPpc summary statistics

GDPpc	MEAN	MAX	MIN	SD
Sample	943.8	7578.9	82.1	75.8
Seychelles	6907.9	7578.9	6004.4	494.3
Gabon	3983.2	4266.7	3829.7	156.9
Mauritius	3743.9	4403.5	3064.4	416.8
Ethiopia	123.1	140.5	110.7	7.9
Burundi	110.9	123.6	104.6	4.8
Congo (DRC)	94.9	116.9	82.1	11.6

The cross-country difference is also shown in the number of international tourists arrivals. The continent's average tourist arrival is 618, 727. However, South Africa, Tunisia and Morocco attract 889, 5465, 81, 091 and 126, 600 tourists on average. However, countries like Comoros, Central Africa, and Sao Tome and Principe are limited to 21, 800, 11,900, and 7,727.2 respectively. This heterogeneity is clearly indicated by the uneven tourists flow growth rate among the countries of analysis. Even though the region's mean growth rate is 10.1 per cent, some countries scored extreme figures. Angola, Burundi and Madagascar have registered a positive growth rate of 43.7, 26.2 and 23.7 per cent respectively. Conversely, countries like Comoros, Congo Republic and Eritrea perform a negative growth rate of -1.4, -3.1 and -3.6 percent respectively.

Table 4.2.2: Tourist arrival summary statistics

TRAV	MEAN	MAX	MIN	SD
Sample	628182.4	7369000	3000	1331016
South Africa	889545.5	7369000	4488000	812613.1
Tunisia	81090.9	6378000	3885000	721778.8
Morocco	126600	5843000	2602000	1041868
Comoros	21800	27000	14000	3893.5
Central africa	11900	26000	3000	6847.6
SAOT&PRINC	7727.2	11000	5000	2092.8

The dataset showed that there is a high correlation between GDP per capita and tourists' per-capita (85 %). Although a multivariate analysis is required, this high correlation coefficient between per capita GDP and per capita tourists` arrival implies that economic growth is important for good tourism performance and tourism contributes for economic growth of a country. The detail summary statistics including other variables is indicated in appendice IX.

4.3. Empirical Results Discussion

In this section, results from the two models are presented and discussed.

4.3.1. Economic growth model

The econometric results are presented in table 4.3[7]. The joint significance of the regressers is significantly supported by the Wald test (`0.0000` P-value). Similarly, the Sargan test (Prob > chi2 = 0.1086) for over-identifying restrictions supports the model. In testing autocorrelation, we fail to accept the null hypothesis of no autocorrelation in the first order. This is because the first difference of white noise is necessarily auto-correlated. While in the second order test the null hypothesis is confirmed statistically (that is, not rejected), which implies the fact that the disturbance terms are not auto-correlated.

[7] The software used in this analysis is stata10.

Table 4.3: Model Estimation Results

4.3.1 Estimation Results from the Economic Growth Model

Economic growth model			
lgdppc	Coef.	Std. Err.	z-value
lgdppc			
L1.	.8530011	.0316388	26.96
trarv	3.70e-08	1.54e-08	**2.40*** **
dscore	.0077411	.0036861	**2.10** **
fscore	.0007956	.0031444	0.25
ppn	-4.24e-09	1.81e-09	**-2.33** **
gdi	-.0013286	.0011385	-1.17
fed	-.0019092	.000537	**-3.56*** **
pse	.0069582	.0071446	0.97
leb	.0090611	.0021571	**4.20*** **
Period	.0075159	.0025443	**2.95*** **
ggc	-1.98e-08	1.09e-08	-1.82
top	-7.39e-06	6.09e-06	-1.21
cons	-14.42477	5.139073	-2.81
Test	Chi2-stat /z-value [8]	P-value	
Sargan	54.70876	0.1086	
Wald	7208.44	0.0000	
AR(1)	2.29	0.022	
AR(2)	0.83	0.406	

The *, ** and * indicate the statistical significance of the variables at 10, 5 and 1 % level of significance respectively.**

[8] Chi2 stat is for the first two tests

There is a significant and positive correlation between tourist arrival and economic growth indicating the contribution of tourism for economic growth in African countries. This supports the hypothesis that tourism sector will have a significant positive contribution to the economic growth of African countries. The econometric results also showed that political stability and life expectancy have a significant and positive effect on the economic growth of those countries

The coefficient of the population variable strongly supports the view of pessimists[9]. That is high population growth is a burden for economic growth. This view can have acceptance in developing countries like Africa with massive unemployment and unproductive labor. The time trend (included to capture implicit factors such as technological advancement or productivity changes in general) has a positive effect on future growth.

Healthy and strong financial sector is profound for economic growth of a country. However, the sign and significance of the financial sector development indicator variable is surprising. It has a significant and negative impact on economic growth performance.

Corruption has a positive sign although it is not statistically significant. Hence, the unexpected sign and significance of the variable in this analysis may be due to the measurement difficulty of corruption that hinders its impact on the economy. This is well explained by Kaufmann (2008). He said, "Africa as a continent is hopelessly corrupt," as well as fallacies on its causes and consequences, were perpetuated. The absence of empirical data on corruption hidden its enormous costs and also gave corrupt politicians "cover", (World Bank, 1999).

[9] Pessimists believe that high population growth has an adverse impact on countries economic growth.

Trade openness, gross domestic investment, general government consumption and public spending on education are turned out to be insignificant. The strongly positive and less than one coefficient of the per capita GDP imply the existence of conditional convergence among African countries[10].

4.3.2. Tourist arrival model

The F-test, which measures the joint significance of the independent variables, is highly significant (0.0000 P-value) implying good performance of the specified model.

4.3.2 Estimation Results from the Tourist Arrival Model

Tourists` arrival model

Trpc	Coef.	Newey-West Std. Err.	t-value
gdppc	.0000648	.0000144	**4.49*** **
p	-1.85e-07	3.08e-07	-0.60
dscore	.0228673	.0073375	**3.12*** **
d1	.0227751	.0356982	0.64
lsec	.0497751	.0239204	**2.08** **
lter	.0624422	.0210195	**2.97*** **
trop	7.41e-08	1.05e-08	**7.03*** **
pse	.0285465	.0094278	**3.03*** **
ppn	-8.84e-09	8.32e-10	**-10.62*** **
period	.0003291	.0041422	0.08
fed	.0008873	.0006097	1.46
gdi	.0036174	.0032399	1.12
cons	-1.03579	8.233841	-0.13
Test	F(11, 67)	P-value	
F	39.91	0.0000	

[10] The coefficient of the per capita GDP is specified as (1+β).

Gdppc is positive and highly significant which supports the second hypothesis of the study that economic growth is relevant for the development of the tourism sector.

Political stability is undoubtedly basic requirement for a successful tourism industry. Many African countries have been affected by political instability, wars, and ethnic violence, which disrupt their tourism industry. This can be evidenced from Kenya's recent election 2008, which rapidly reduced the attraction of tourists within short period of time due to the problem of safety and security created. The positive and strongly significant coefficient of the variable in this study confirms this fact.

The significant and positive coefficient of the tourism openness variable in this analysis indicates the role of the variable in boosting Africa's tourism performance. The reason is that, countries restrictive policies are counterproductive to tourism. Hence, when they open their doors for tourists and have visa-free entry program, definitely tourist arrival boosted. Similarly, Air Port Liberalization (open sky agreement among countries) has a great role in attracting more tourists.

It is reasonable to expect strong positive effect of human capita on tourism per capita. Investments on human capital have a significant impact on productivity. In this analysis, the secondary and tertiary school enrollments that serve as proxy to human capita have positively significant coefficient. However, tertiary education is much stronger than the secondary enrollment. The coefficient of the population variable is significantly negative. This implies the adverse effect of population on countries tourism performance.

The financial sector development (FED) and the price variable has the expected sign but not significant. This implies that tourists are much concerned about other factors as political stability, education level, and country's over all progress than quality of services given in the

financial sector of destination countries and relative prices of those countries. Similarly, gross domestic investment and public spending on education have the expected sign (positive impact on tourism growth) though gross domestic investment is insignificant.

Country effect dummy (d1) is positive but not significant. This suggests that countries economic development has insignificant spill over effect for further tourism performance. This may justify the impact of Africa's image on its tourism performance. That is, tourists are influenced by the history of Africa than by its economic improvement. Similarly, the time trend (included to capture implicit factors such as technological advancement) has insignificant positive effect.

CHAPTER- FIVE

CONCLUSION AND POLICY IMPLICATIONS

Tourism can serve as source of foreign exchange earnings, income and employment. The purpose of this thesis was to explore the link between the tourism sector and economic growth using panel dataset for the period 1995-2005 for forty-two African countries. The paper applied pooled ordinary least squares and a dynamic panel estimated by the systems generalized method of moment's estimator.

The finings showed that there is a positive correlation between economic growth and tourism sector. The result is in line with our hypothesis that the tourism sector will have a significant positive contribution to the economic growth of African countries and economic growth is also a relevant input for tourism sector development.

In addition to economic growth measured by GDP per capita, political instability, tourism openness and human capital are important variables as they contribute to under-utilization of tourism resources. Hence, the policy implication of these findings is that African countries should create conducive environment (e.g. political stability) and commit their resources to increase the contribution of the tourism sector to national income. That is African countries should give the sector the needed attention by committing their resources to improve their human capital, openness to tourism and their economic growth in general whose expenses promise significant contributions to national income, employment opportunities and foreign exchange earnings.

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APPENDIX

Appendice I: Country ID and Code[11]

Country Name	Country Code	Country ID
Algeria	DZA	1
Angola	AGO	2
Benin	BEN	3
Botswana	BWA	4
Burkina Faso	BFA	5
Burundi	BDI	6
Cameroon	CMR	7
Cape Verde	CPV	8
Central Africa rep	CAF	9
Chad	TCD	10
Comoros	COM	11
Congo (DRC)	ZAR	12
Congo	COG	13
Djibouti	DJI	14
Eritrea	ERI	15
Ethiopia	ETH	16
Gabon	GAB	17
Gambia	GMB	18
Ghana	GHA	19
Guinea	GIN	20
Kenya	KEN	21
Madagascar	MDG	22
Malawi	MWI	23
Mali	MLI	24
Mauritius	MUS	25
Morocco	MAR	26
Namibia	NAM	27
Niger	NER	28
Nigeria	NGA	29
SAOT and PRINC	STP	30
Senegal	SEN	31
Seychelles	SYC	32
Sierra Leone	SLE	33
South Africa	ZAF	34
Sudan	SDN	35
Swaziland	SWZ	36
Tanzania	TZA	37
Togo	TGO	38
Tunisia	TUN	39
Uganda	UGA	40
Zambia	ZMB	41
Zimbabwe	ZWE	42

[11] Countries code is directly taken from the World Bank.

Appendice II: Estimation Results of the Economic Growth Model

```
xtdpdsys lgdppc trarv dscore fscore  ppn gdi fed pse leb period ggc top

System dynamic panel-data estimation         Number of obs         = 166
Group variable: country                      Number of groups = 38
Time variable: period
                                             Obs per group: min = 1
                                                            Avg = 4.368421
                                                            max = 9
Number of instruments = 56                Wald chi2(12)         =   7208.44
                                             Prob > chi2           = 0.0000
One-step results
------------------------------------------------------------------------------
      lgdppc |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      lgdppc |
         L1. |   .8530011   .0316388     26.96   0.000     .7909903     .915012
       trarv |   3.70e-08   1.54e-08     2.40    0.016     6.79e-09    6.72e-08
      dscore |   .0077411   .0036861     2.10    0.036     .0005164    .0149658
      fscore |   .0007956   .0031444     0.25    0.800    -.0053674    .0069586
         ppn |  -4.24e-09   1.81e-09    -2.33    0.020    -7.79e-09   -6.80e-10
         gdi |  -.0013286   .0011385    -1.17    0.243      -.00356    .0009028
         fed |  -.0019092    .000537    -3.56    0.000    -.0029617   -.0008568
         pse |   .0069582   .0071446     0.97    0.330     -.007045    .0209614
         leb |   .0090611   .0021571     4.20    0.000     .0048332     .013289
      period |   .0075159   .0025443     2.95    0.003     .0025292    .0125026
         ggc |  -1.98e-08   1.09e-08    -1.82    0.069    -4.12e-08    1.57e-09
         top |  -7.39e-06   6.09e-06    -1.21    0.225    -.0000193    4.54e-06
       _cons |  -14.42477   5.139073    -2.81    0.005    -24.49717   -4.352374
------------------------------------------------------------------------------
Instruments for differenced equation
        GMM-type: L(2/.).lgdppc
        Standard: D.trarv D.dscore D.fscore D.ppn D.gdi D.fed D.pse D.leb
                  D.period D.ggc D.top
Instruments for level equation
        GMM-type: LD.lgdppc
        standard: _cons
```

Appendice III : Estimation Results of the Tourists` Arrival Model

```
newey trpc gdppc  p dscore d1 lsec lter trop  pse  ppn period fed gdi, lag(2) force

Regression with Newey-West standard errors          Number of obs  =        80
maximum lag: 2                                      F( 11,    67)  =     39.91
                                                    Prob > F       =    0.0000

------------------------------------------------------------------------------
             |             Newey-West
        trpc |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       gdppc |   .0000648   .0000144     4.49   0.000      .000036    .0000936
           p |  -1.85e-07   3.08e-07    -0.60   0.549    -8.00e-07    4.29e-07
      dscore |   .0228673   .0073375     3.12   0.003     .0082215     .037513
          d1 |   .0227751   .0356982     0.64   0.526    -.0484789    .0940291
        lsec |   .0497751   .0239204     2.08   0.041     .0020299    .0975204
        lter |   .0624422   .0210195     2.97   0.004     .0204872    .1043973
        trop |   7.41e-08   1.05e-08     7.03   0.000     5.30e-08    9.51e-08
         pse |   .0285465   .0094278     3.03   0.003     .0097285    .0473645
         ppn |  -8.84e-09   8.32e-10   -10.62   0.000    -1.05e-08   -7.18e-09
      period |   .0003291   .0041422     0.08   0.937    -.0079388     .008597
         fed |   .0008873   .0006097     1.46   0.150    -.0003297    .0021042
         gdi |   .0036174   .0032399     1.12   0.268    -.0028494    .0100842
       _cons |   -1.03579   8.233841    -0.13   0.900    -17.47061    15.39903
------------------------------------------------------------------------------

.
```

Appendice IV: Estimation Results of the Economic Growth Model with outoutliers

```
xtdpdsys lgdppc trarv dscore fscore  ppn gdi fed pse leb period ggc top

System dynamic panel-data estimation         Number of obs         = 150
Group variable: country                      Number of groups      = 36
Time variable: period
                                             Obs per group: min = 1
                                                            avg =  4.166667
                                                            max =         8

Number of instruments = 54                   Wald chi2(12)         =   8497.04
                                                 Prob > chi2           = 0.0000
One-step results
------------------------------------------------------------------------------
      lgdppc |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      lgdppc |
         L1. |   .8387307   .0342714    24.47   0.000     .7715601    .9059014
       trarv |   6.65e-08   1.74e-08     3.82   0.000     3.24e-08    1.01e-07
      dscore |   .0065069   .0038698     1.68   0.093    -.0010777    .0140915
      fscore |   .0016813   .0032245     0.52   0.602    -.0046386    .0080012
         ppn |  -7.05e-09   1.97e-09    -3.58   0.000    -1.09e-08   -3.18e-09
         gdi |   -.001428   .0011523    -1.24   0.215    -.0036865    .0008305
         fed |  -.0016087   .0005479    -2.94   0.003    -.0026825   -.0005349
         pse |    .004626   .0068203     0.68   0.498    -.0087416    .0179936
         leb |   .0097382   .0025788     3.78   0.000     .0046838    .0147925
      period |   .0087353   .0026965     3.24   0.001     .0034503    .0140203
         ggc |  -2.32e-08   1.06e-08    -2.20   0.028    -4.39e-08   -2.51e-09
         top |  -.0000101   6.12e-06    -1.65   0.099    -.0000221    1.89e-06
       _cons |  -16.78482   5.426072    -3.09   0.002    -27.41972    -6.14991
------------------------------------------------------------------------------
Instruments for differenced equation
        GMM-type: L(2/.).lgdppc
        Standard: D.trarv D.dscore D.fscore D.ppn D.gdi D.fed D.pse D.leb
                  D.period D.ggc D.top
Instruments for level equation
        GMM-type: LD.lgdppc
        Standard: _cons

.
```

Appendice V: Estimation Results of the Tourists Arrival Model with out outliers

```
newey trpc gdppc  p dscore d1 lsec lter trop  pse  ppn period fed gdi, lag(2) force

Regression with Newey-West standard errors          Number of obs  =        65
maximum lag: 2                                      F( 11,    52)  =     34.59
                                                    Prob > F       =    0.0000

------------------------------------------------------------------------------
             |             Newey-West
        trpc |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       gdppc |   .0000733   .0000276     2.66   0.010      .000018    .0001286
           p |  -1.97e-07   3.26e-07    -0.60   0.548    -8.52e-07    4.58e-07
      dscore |   .0251813   .0079574     3.16   0.003     .0092137     .041149
          d1 |   .0036851    .034257     0.11   0.915    -.0650566    .0724267
        lsec |   .0278963   .0288226     0.97   0.338    -.0299404    .0857331
        lter |   .0512553   .0232889     2.20   0.032     .0045226    .0979879
        trop |   3.20e-08   2.56e-08     1.25   0.216    -1.93e-08    8.33e-08
         pse |    .032015   .0096942     3.30   0.002     .0125622    .0514679
         ppn |  -3.93e-09   2.93e-09    -1.34   0.186    -9.81e-09    1.96e-09
      period |    .000225   .0052477     0.04   0.966    -.0103053    .0107552
         fed |    .001397   .0011077     1.26   0.213    -.0008258    .0036197
         gdi |   .0020862   .0036285     0.57   0.568     -.005195    .0093674
       _cons |  -.7378903   10.42013    -0.07   0.944    -21.64741    20.17163
------------------------------------------------------------------------------
```

Appendice VI: Variance-inflating factor (VIF) from the economic growth model[12]

Variable	VIF	1/VIF
top	2.26	0.442387
leb	2.11	0.475053
trarv	2.01	0.496556
ppn	1.95	0.511763
pse	1.73	0.579511
fed	1.69	0.592011
gdi	1.67	0.598515
fscore	1.16	0.862733
period	1.14	0.877783
dscore	1.12	0.891315
ggc	1.10	0.910031
Mean VIF	1.63	

Appendice VII: Variance-inflating factor (VIF) from tourist arrival model

Variable	VIF	1/VIF
trop	5.95	0.167934
lter	5.30	0.188610
lsec	4.24	0.235670
ppn	4.05	0.246864
gdppc	3.52	0.284297
fed	2.56	0.390839
d1	2.54	0.393426
p	2.10	0.476507
pse	2.07	0.483559
gdi	1.43	0.701434
dscore	1.30	0.766514
period	1.17	0.853567
Mean VIF	3.02	

[12] As a rule of thumb, if the VIF of a variable exceeds 10, variable is said be highly collinear.

Appendice VIII : Summary Statistics of all Variables

Variable	Obs	Mean	Std. Dev.	Min	Max
country	462	21.5	12.13406	1	42
period	462	2000	3.165706	1995	2005
gdppc	462	943.8549	1383.631	82.158	7578.9
trarv	433	628182.4	1331016	3000	7369000
ggc	439	296832.5	1864590	0	1.40e+07
leb	459	51.71347	10.05724	.0069993	73.451
gdi	415	20.12495	8.248349	2.1	68.104
ter	313	4.598665	5.212243	.2289	30.1798
pse	233	4.413919	1.949794	.65	12.15
sec	332	38.26506	25.53705	5	114
top	452	7436.19	3637.855	0	19891
trpc	446	.1227142	.278483	0	1.714278
fed	452	32.27189	26.28441	4.1067	159.27
dscore	416	-.5658841	1.176989	-6.85	4.5
fscore	395	-.6618727	1.068275	-13.99	6.21
ppn	462	1.60e+07	2.17e+07	75304	1.32e+08
trop	279	1665538	3112632	497.2581	1.58e+07
p	396	77753.67	214088.8	.0000662	2273750
lgdppc	462	6.173778	1.068884	4.408644	8.933124
ltrarv	433	628182.4	1331016	3000	7369000
trrg	413	13895.88	648730	-7340000	4448000
lsec	332	3.411579	.7117314	1.609438	4.736198
lter	313	1.015025	1.013266	-1.47447	3.407173

.

Appendice IX: Descriptive Statistics of Major Variables by Country ID

Statistics	y	GDPpc	trarv	ppn	ggc	leb	gdi	ter
ave	1	308.8718	889545.5	30519545	15.27664	69.98359	27.8049	16.40574
ave	2	691.1864	81090.91	13965364		40.41967	21.22669	1.400406
ave	3	308.8718	126600	7252836	11.73314	53.77519	18.2473	3.007632
ave	4	3516.309	973300	1726427	24.56927	45.30652	27.0321	4.594256
ave	5	234.37	145900	11396991	13.06373	46.78461	22.0502	1.364502
ave	6	110.98	55181.82	6647673	20.41627	42.8055	7.70914	1.416184
ave	7	676.7345	211111.1	14839818	9.49257	47.59303	17.3339	4.702604
ave	8	1151.674	100818.2	452045.5	16.32989	68.97493	22.7246	3.586507
ave	9	240.8191	11900	3754509	11.66638	41.28046	12.93261	1.568547
ave	10	195.0455	32818.18	8296855	6.820173	44.30728	28.6254	0.874877
ave	11	380.0845	21800	541532.7	15.80736	60.62231	14.6533	1.32162
ave	12	94.96409	50272.73	50625455	6.801573	42.56571	8.77752	1.824787
ave	13	951.6891	25625	3444555	16.20273	51.54568	25.8171	5.407318
ave	14	809.15	22454.55	707175.5	29.37427	52.41671	10.66288	0.834053
ave	15	194.4936	174636.4	3638918	49.30691	52.5176	28.4574	1.185903
ave	16	123.1664	146272.7	64153273	13.30205	42.84887	20.5989	1.477836
ave	17	3983.227	173777.8	1262673	13.12966	56.52252	27.6312	6.552217
ave	18	314.7464	80454.55	1315891	13.1125	54.4631	19.9552	1.556467
ave	19	252.8182	407300	19894273	11.93935	56.8102	22.7636	2.765965
ave	20	366.8045	32700	8455327	6.1388	52.46107	17.96874	1.863535
ave	21	421.8445	908600	30700273	16.29	49.51533	17.277	2.257856
ave	22	230.6236	127800	16224818	8.129773	54.53081	15.5085	2.23171
ave	23	148.7873	283900	11485545	15.96318	41.03702	13.6314	0.494366
ave	24	214.0818	92454.55	11725727	10.66874	47.56639	22.5875	1.848656
ave	25	3743.918	614636.4	1185182	13.36309	71.36451	25.2059	10.67569
ave	26	1234.818	4042818	27980636	19.35809	68.5201	22.46	10.37339
ave	27	1851.109	584666.7	1870900	28.06309	53.57182	23.2044	5.843644
ave	28	157.9564	46555.56	11845673	11845673	43.32507	11.70291	0.736125
ave	29	401.5118	804000	1.18E+08	17.34668	44.10327	20.8116	6.545358
ave	30	336.9136	7727.273	140699.1	37.62664	62.63666	42.5328	
ave	31	425.2873	355727.3	10360745	12.86755	55.14064	18.8778	4.062187
ave	32	6907.945	127181.8	80478.73	26.45218	71.77004	29.501	
ave	33	178.4327	27000	4657727	13.12463	38.19302	7.85938	1.733741
ave	34	3092.436	5876545	43462818	18.90045	50.32713	16.7202	15.6918
ave	35	378.9273	42700	32835636	7.85256	55.71679	17.876	5.328414
ave	36	1334.873	366909.1	1032378	22.225	48.89852	19.5843	4.954758
ave	37	272.6755	458900	34721545	10.24946	43.26211	17.1513	0.796349
ave	38	249.7691	67454.55	5341173	10.25445	55.12334	17.4566	3.410799
ave	39	2025.927	4983364	9533745	15.67973	72.51036	25.9596	20.67904
ave	40	240.9555	257272.7	24537273	13.50936	44.99657	18.7596	2.448394
ave	41	314.1264	397600	10661927	14.0794	38.49667	19.1089	2.405659
ave	42	572.98	1749143	12520000	17.88027	42.82482	14.48862	4.652272

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Statistics	country	pse	sec	pr	top	trpc	fed
ave	1	5.105	73.66667	2.915334	5786.855	0.028792	44.96909
ave	2	2.599512	13.66667	2.240394	14133.1	0.005509	14.3884
ave	3	3.178532	22.22222	2.628405	4359.955	0.016262	24.77582
ave	4	8.972218	71.1	2.272686	8706.818	0.508783	23.51982
ave	5	2.547489	11.11111	3.621424	3451.173	0.011784	20.77255
ave	6	4.226097	33.88889	5.881704	3160.727	0.007929	21.06809
ave	7	2.830645	60.28571	2.639867	4450.67	0.011804	15.2667
ave	8	6.765571	11	3.265911	8549.511	0.215483	64.07609
ave	9	1.861444	12.33333	4.006441	3560.913	0.003282	17.26327
ave	10	1.747704	40.83333	3.752183	6502.72	0.00398	10.95825
ave	11	3.803556	17.33333	3.787859	5098.827	0.037444	20.942
ave	12		27.75	4.988346	5275.318	0.000997	5.35982
ave	13	3.199681	21	1.289778	13407.18	0.005806	13.98909
ave	14	5.807902	83.11111	2.443231	8808.945	0.031724	63.09182
ave	15	4.118704	26.22222	5.6051	10074.4	0.051844	128.8638
ave	16	3.865851	20.55556	6.530848	3787.773	0.002255	36.64455
ave	17	3.258281	47.25	1.503685	9354.3	0.114324	15.809
ave	18	3.303187	35.625	5.309473	10230.35	0.061105	32.53364
ave	19	4.579935	37.55556	5.624079	9010.173	0.020488	23.09182
ave	20	1.922845	19.77778	4.859442	4864.582	0.003757	10.3688
ave	21	5.985537	38.44444	2.43488	5482.764	0.029981	35.45827
ave	22	2.673917	15.33333	3.221049	5756.736	0.00789	19.87073
ave	23	4.958631	28.55556	3.572425	6939.009	0.022362	16.40727
ave	24	3.2985	17	3.079959	6468.536	0.007793	24.19318
ave	25	4.181013	77	2.513628	12303.27	0.516385	89.78282
ave	26	6.022961	41.7	2.74331	6677.391	0.143186	78.15255
ave	27	7.962283	59.63636	2.961203	10089.29	0.31485	40.43036
ave	28	2.448342	6.777778	3.783328	4105.591	0.00405	10.3148
ave	29	0.65	31	1.630698	8279.8	0.006895	18.89736
ave	30		39.75	5.134691	12242.64	0.054239	36.3794
ave	31	3.827802	16.6	2.862899	6930.173	0.034283	25.97318
ave	32	6.013775	108.75	2.005954	14157.45	1.582504	89.95018
ave	33	4.483464	24	3.17527	5017.018	0.005708	14.48554
ave	34	5.621915	90.22222	2.66172	5140.39	0.134617	52.01236
ave	35	9.89	28.55556	3.779139	3052.68	0.001183	11.41181
ave	36	6.501795	45.9	2.842216	17820.73	0.350978	21.75755
ave	37	2.171718	5.8	2.184373	4424.645	0.013237	19.92255
ave	38	3.92022	32.71429	4.67169	7760.091	0.012698	24.27836
ave	39	6.932162	73.9	2.78888	9277.182	0.520865	50.64755
ave	40	3.407606	15.2	4.701659	3622.591	0.010188	15.52391
ave	41	2.154403	24.11111	2.248326	5814.7	0.037195	17.18309
ave	42	4.571906	42.875	0.004426	7173.864	0.141751	25.93773

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Statistics	Country	GDPpc	trarv	ppn	ggc	leb	gdi	ter
max	1	326.31	1443000	32854000	17.792	71.734	32.351	20.33644
max	2	936.87	210000	15941000		41.416	35.533	3.153907
max	3	326.31	175000	8438900	14.994	54.989	19.598	3.66
max	4	4648.5	1523000	1771600	28.541	56.778	33.521	6.3095
max	5	252.07	222000	13228000	14.95	48.483	27.177	2.380693
max	6	123.69	148000	7547500	28.438	44.648	13.658	2.332077
max	7	738.67	277000	16322000	10.402	50.05	20.311	6.10328
max	8	1336.7	198000	506810	21.288	70.71	42.435	6.933239
max	9	252.25	26000	4037700	15.2	44.14	17.525	1.822251
max	10	266.7	57000	9748900	7.8956	45.266	60.509	1.211211
max	11	386.78	27000	600490	22.276	62.874	19.457	2.2709
max	12	116.99	103000	57549000	8.2924	44.032	27.852	2.1334
max	13	996.95	39000	3998900	24.198	52.81	36.575	7.9783
max	14	926.43	30000	793080	34.917	53.387	15.272	2.277152
max	15	222.53	417000	4401400	69.543	54.904	35.966	1.460321
max	16	140.59	227000	71256000	18.856	44.102	23.56	2.679413
max	17	4266.7	222000	1383800	16.917	58.821	37.284	6.552217
max	18	335.19	111000	1517100	14.851	56.792	28.1	1.8644
max	19	287.49	584000	22113000	17.503	57.482	26.6	5.212966
max	20	385.15	45000	9402100	7.5314	54.053	23.613	2.992307
max	21	442.31	1199000	34256000	18.458	53.143	21.82	2.821842
max	22	246.65	229000	18606000	9.7612	55.815	24.29	2.61038
max	23	154.13	471000	12884000	20.95	43.091	17.392	0.6301
max	24	243.67	143000	13518000	15.942	48.615	31.01	2.563772
max	25	4403.5	761000	1243300	14.397	73.017	28.845	17.24369
max	26	1356.1	5843000	30168000	22.773	70.376	25.045	11.2737
max	27	2083.1	757000	2031300	30.318	59.521	29.808	8.0901
max	28	166.82	58000	13957000	13957000	44.933	15.799	0.916873
max	29	459.31	962000	1.32E+08	27.078	45.184	26.059	10.18457
max	30	356.92	11000	156520	52.052	63.487	68.104	
max	31	473.55	427000	11658000	13.998	56.451	23.375	5.397404
max	32	7578.9	132000	84494	31.237	72.954	43.25	
max	33	217.77	44000	5525500	17.581	41.364	13.751	2.178792
max	34	3405.9	7369000	46888000	20.18	58.002	18.174	18.5385
max	35	462.26	61000	36233000	16.974	56.661	22.546	6.132854
max	36	1368.9	839000	1131000	27.565	57.644	22.387	6.2159
max	37	329.94	566000	38329000	13.564	49.857	19.79	1.391458
max	38	276.9	92000	6145000	12.122	56.38	20.37	3.7455
max	39	2412.4	6378000	10029000	16.289	73.451	27.848	30.1798
max	40	270.2	512000	28816000	15.266	49.955	22.505	3.437251
max	41	350.48	565000	11668000	18.267	40.556	26.134	2.5602
max	42	675.39	2101000	13010000	26.644	48.873	20.751	6.6969

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Statistics	country	pse	sec	pr	top	trpc	fed
max	1	5.43	83	3.194683	7110.6	0.043922	58.199
max	2	2.607531	17	3.125364	17900	0.013174	20.159
max	3	4.382799	33	3.178838	5320.2	0.022455	29.291
max	4	10.65887	75	2.883613	9755.7	0.86089	27.27
max	5	4.682468	14	4.292055	4148.5	0.017314	23.942
max	6	5.160941	44	7.92649	4480.3	0.019609	25.918
max	7	3.492329	68	3.099011	5130	0.018646	17.059
max	8	7.937703	12	3.965184	9953.6	0.390679	75.749
max	9	1.861444	16	4.905575	4807.9	0.007615	22.496
max	10	2.063402	53	4.753505	10003	0.006702	12.954
max	11	3.880588	24	4.598915	6433	0.052125	25.032
max	12		35	6.035841	7088.7	0.002058	7.2103
max	13	4.185065	24	1.71005	14892	0.01294	16.417
max	14	7.860062	87	2.511198	9389.9	0.037827	73.617
max	15	5.377609	31	6.603586	11662	0.132469	159.27
max	16	4.023752	31	8.049418	5545.1	0.003186	46.036
max	17	3.932669	50	1.902814	10346	0.165511	17.644
max	18	5.54	47	6.80303	12196	0.075288	43.919
max	19	5.449414	44	7.673081	11670	0.026957	28.645
max	20	2.146152	30	6.61878	5597.7	0.00489	14.602
max	21	6.737405	49	2.900406	7174.6	0.035826	37.485
max	22	3.289901	16	3.653335	8182.3	0.012643	23.378
max	23	5.810404	37	4.275451	7980.9	0.037357	20.471
max	24	4.314944	24	3.988899	8356.4	0.010578	30.182
max	25	4.75	88	2.887204	13073	0.612081	136.18
max	26	6.746951	50	3.19854	7926	0.193682	97.372
max	27	8.65	63	4.032209	10918	0.386205	43.11
max	28	2.85	9	4.502703	4409.2	0.004597	13.999
max	29	0.65	35	2.68136	9202.8	0.007708	25.881
max	30		44	5.629508	13940	0.071914	60.422
max	31	5.377516	21	3.470669	7461.9	0.039333	34.307
max	32	7.71	114	2.215338	18712	1.714278	114.63
max	33	4.949343	30	3.753109	6673.5	0.009186	18.131
max	34	6.8	96	3.860607	6122.1	0.157162	56.417
max	35	12.15	35	4.67313	4601.6	0.001717	17.428
max	36	8.740796	54	3.988422	19891	0.741821	24.666
max	37	2.171718	7	2.614566	5934	0.01657	24.805
max	38	4.41	40	5.605567	8548.5	0.019041	27.798
max	39	7.487934	84	3.226725	9994	0.635956	57.255
max	40	5.231151	19	5.878989	4124.7	0.018403	19.433
max	41	2.82597	28	2.596011	7578.3	0.050892	19.081
max	42	4.571906	49	0.007861	9574.2	0.168403	44.854

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Statistics	Country	GDPpc	trarv	ppn	ggc	leb	gdi	ter
min	1	280.29	520000	28271000	12.145	68.649	22.592	11.9769
min	2	545.5	9000	12280000		39.974	9.2079	0.583112
min	3	280.29	72000	6200600	9.3805	53.543	16.998	2.5571
min	4	2562.2	512000	1615500	19.673	34.966	19.954	2.891506
min	5	214.42	117000	9831900	12.189	45.945	17.814	0.922
min	6	104.64	11000	6159100	16.774	41.979	5.8849	0.8199
min	7	600.67	100000	13302000	8.2274	45.803	14.523	3.4496
min	8	972.01	28000	401110	11.254	67.471	18.3	1.483042
min	9	225.19	3000	3414400	9.607	39.373	4.3031	1.353
min	10	168.33	19000	7033600	4.9449	43.608	13.193	0.6104
min	11	373.31	14000	486190	12.199	58.851	10.19	0.611
min	12	82.158	28000	44999000	4.9137	41.486	2.1	1.301148
min	13	893.82	14000	2915600	11.568	50.822	21.016	3.563351
min	14	767.3	20000	608730	26.269	51.817	8.4381	0.2289
min	15	171.9	57000	3097300	29.923	50.812	22.537	0.9708
min	16	110.71	103000	56530000	8.3371	42.129	17.608	0.7202
min	17	3829.7	125000	1118700	7.0576	53.826	23.337	6.552217
min	18	299.25	45000	1115200	10.965	52.743	17.2	1.101355
min	19	227.05	286000	17725000	7.8272	56.648	19.7	1.3248
min	20	337.13	12000	7524800	3.8257	50.545	9.8924	1.2283
min	21	413.89	792000	27226000	14.843	47.061	15.004	1.543
min	22	209.4	62000	13946000	6.7087	53.219	10.942	2.0017
min	23	140.45	192000	10111000	13.446	39.626	11.367	0.287273
min	24	185.49	42000	10147000	8.4317	47.095	18.614	1.0475
min	25	3064.4	422000	1122500	12.697	70.323	21.356	6.0853
min	26	1064.1	2602000	26285000	16.853	66.902	19.58	8.998741
min	27	1739.2	272000	1651500	23.441	46.928	19.548	0.6918
min	28	152.63	35000	9929400	9929400	41.808	7.317	0.6407
min	29	379.85	611000	1.04E+08	8.0317	43.304	14.174	4.02
min	30	324.35	5000	127510	27.178	62.188	30.424	
min	31	387.49	280000	9119500	11.831	54.449	15.6	3.2204
min	32	6004.4	121000	75304	22.687	71.117	10.066	
min	33	139.52	11000	4136700	8.9311	29.12366	2.4206	1.4392
min	34	2960.4	4488000	39120000	18.148	44.607	15.292	14.31573
min	35	310.3	29000	29352000	0	54.591	12.423	4.6744
min	36	1311.1	256000	900000	17.726	41.459	17.412	4.29387
min	37	240.35	285000	30930000	7.7856	0.006999	13.848	0.4618
min	38	238.2	53000	4512200	8.4075	54.182	13.34	3.063196
min	39	1651.4	3885000	8957500	15.427	71.354	24.752	13.0148
min	40	206.65	160000	20892000	11.178	42.655	12.412	1.7265
min	41	295.04	163000	9559400	9.5354	37.412	12.846	2.249572
min	42	426.37	1281000	11820000	13.557	37.213	7.1148	3.238238

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Statistics	Country	pse	sec	pr	top	trpc	fed
min	1	4.78	62	2.269028	4509.4	0.018393	33.399
min	2	2.591494	12	1.13441	12177	0.000733	10.94
min	3	2.487439	16	2.221718	3937.9	0	20.893
min	4	7.93	63	1.893191	8088	0	18.398
min	5	1.45	9	3.081608	3011.6	0	17.698
min	6	3.247741	25	4.019232	2157.4	0.001757	16.244
min	7	1.768979	43	2.223267	3923.1	0	12.919
min	8	4.375809	10	2.826517	7546	0.069806	55.49
min	9	1.861444	9	3.341254	2571	0.000772	14.499
min	10	1.634939	32	2.54841	4661	0.002299	7.5797
min	11	3.751029	13	3.075448	4522.2	0	16.745
min	12		21	2.208322	3375	0.000531	4.1067
min	13	2.195032	18	0.991504	12392	0	11.89
min	14	3.467956	75	2.40663	8232.1	0.027989	53.401
min	15	2.14	19	4.987829	6451.1	0.016639	80.686
min	16	3.593173	12	4.980429	2541.5	0.001822	27.362
min	17	2.48	45	1.194641	7183.7	0	13.276
min	18	2.017403	25	4.153274	7719.1	0.040352	23.531
min	19	4.08	32	4.376955	5742.3	0.016135	17.696
min	20	1.753375	12	3.38446	4296.4	0.001551	5.6453
min	21	5.186734	24	2.107934	4651.6	0.026155	32.175
min	22	1.85	14	2.695942	3858.2	0.003616	17.477
min	23	4.141463	17	2.211701	5470.2	0	13.392
min	24	2.13	11	2.621997	5578.5	0.004139	19.975
min	25	3.288502	62	2.119459	11112	0.375947	75.443
min	26	4.88	37	2.333643	5646.8	0.098992	60.327
min	27	6.922233	56	2.446445	9133.1	0.164699	36.386
min	28	2.072751	6	3.200667	3828.3	0.003525	6.952
min	29	0.65	24	0.655053	7159.2	0.005587	12.201
min	30		36	4.589608	10211	0.03789	25.948
min	31	3.378614	15	2.447894	6501.2	0.030138	21.667
min	32	5.188449	102	1.815063	0	1.446624	65.292
min	33	3.791536	17	2.474673	2910.9	0.002514	8.7909
min	34	5.066674	85	2.048283	4486.6	0.114724	46.562
min	35	7.63	21	2.7399	1759.7	0	7.4012
min	36	5.437141	42	1.998335	16459	0.235251	18.81
min	37	2.171718	5	1.927362	3712.6	0.009214	17.446
min	38	2.630991	27	4.10422	6789	0.010205	21.048
min	39	6.33	60	2.332478	8572	0.427426	43.657
min	40	2.461668	9	3.43479	3004.4	0.007658	11.229
min	41	1.929663	19	1.641415	4162.8	0.017051	14.112
min	42	4.571906	36	0.001393	1935	0.105129	17.854

DECLARATION

I, the undersigned, declare that this thesis is my original work and has not been presented for a degree in any other university, and all the sources of materials used for the thesis have been duly acknowledged.

Declared by:

Name: Tsega Hagos

Signature: _____

Date: _____

Confirmed by Advisor:

Name:_____

Signature: _____

Date: _____

Place and date of submission: _____