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INFRASTRUCTURE INVESTMENT, TOURISM AND ECONOMIC GROWTH IN SUB-SAHARAN AFRICA

BY

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DECLARATION

I do hereby declare that, with the exception of references to other people's work which have been cited accordingly, this thesis is the outcome of my own research, undertaken under the guidance of my supervisors. This is the result of my own investigations and has not been presented either in part or in full for any other degree.

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CERTIFICATION

We hereby certify that this thesis was supervised in accordance with procedures laid down by the University of Ghana.

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DEDICATION

I dedicate this work to the Almighty God for His strength and provisions, and to my life coach, Amazing Vinny Max Bani.

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I am very much grateful to my supervisors; Dr. Agyapomaa Gyeke-Dako and Dr. Emmanuel Sarpong-Kumankoma, for their patience and direction throughout my study for this degree.

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I ask God to reward you richly.

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LIST OF ABBREVIATIONS

APTA	-	Association for the Promotion of Tourism to Africa
AfDB	-	African Development Bank
GMM	-	Generalized Methods of Moments
ICT	-	Information Communication Technology
IMF	-	International Monetary Fund
LDC	-	Less-Developed Countries
MNCs	-	Multinational Corporations
MNEs	-	Multinational Enterprises
OECD	-	Organisation for Economic Cooperation and Development
SSA	-	Sub-Saharan Africa
TLGH	-	Tourism-Led Growth Hypothesis
UNCTAD	-	United Nation Conferences on Trade and Developments
UNECA	-	United Nations Economic Commission for Africa
UNDP	-	United Nations Development Programme
UNICEF	-	United Nations International Children's Emergency Fund
UNWTO	-	United Nations World Tourism Organization
WTTC	-	World Travel and Tourism Council

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ABSTRACT

The belief that tourism drives economic growth is what is popularly known in the literature as the tourism-led growth hypothesis. Despite this well-known belief, not many studies have rigorously looked at the relationship between tourism and economic growth. As such, this study seeks to add to the literature in that regard. More importantly, narrowing it down to the SSA region, the increase in international tourism receipts coupled with an upsurge in the tourist arrivals especially in the last two decades makes the kind of growth prospects the tourism industry holds for the region more profound and worth studying. However, one main factor restricting the tourism sectors of the region from realizing their full growth potential is inadequate infrastructure. The problem of inadequate infrastructure partly stems from the low level of investment in infrastructure in these regions. Given that tourism thrives on the infrastructure that supports it, it becomes imperative to look at how investment in infrastructure enhances tourism's impact on economic growth. Therefore, this study addresses this by employing the System Generalized Methods of Moments (GMM) estimation technique on a dynamic panel data from 41 SSA countries from 2000-2018.

The results from the study confirm that indeed tourism thrives on the infrastructure that supports it and as a result investment in infrastructure is essential to promote tourism. The tourism-led growth hypothesis in the case of SSA is also confirmed and the study further reveals that tourism's impact on economic growth for the SSA region is also dependent on the level of investment in infrastructure.

With this study being the first to explore the relationship among investment in infrastructure, tourism and economic growth in the case of SSA and also owing to the methodology employed, further studies could set out to investigate whether the contribution of other sectors to economic

growth, such as manufacturing and agriculture, could also be enhanced through infrastructure investment since these other sectors also thrive on the kind of infrastructure that supports them.

CHAPTER ONE

INTRODUCTION

1.1 Background to Study

Globally, the tourism sector has risen to become a major driver of growth and economic advancement in many nations. Internationally, tourist arrivals increased to a high record of 7.0% in 2017, a 1% increase from 2016, beating the United Nation World Tourism Organization's (UNWTO, 2017) prediction of a 3.8% yearly rise from 2000 to 2010. The tourism sector in 2011, engineered about 8.8% of jobs worldwide while accounting for 9.1% of GDP and 4.5% of production investments globally, which is US$652 billion as reported by the World Travel and Tourism Council (WTTC, 2011). Globally, 1 of every 11 jobs falls within the tourism sector according to WTTC in 2016. The UNWTO also confirms that about USD 1.3 trillion, thus 7% of the world's exports come from the tourism sector making it the third-largest export sector (UNWTO, 2018). Reportedly, international tourism receipts throughout the world also rose sharply to US$ 1,260 billion in 2015 from US$ 2 billion in 1950 (UNWTO, 2017). International tourism also brought about some US$ 211 billion as export earnings through transport services to international tourists in 2015. This translates into a daily average upturn of US$ 4 billion for export earnings alone. These come to confirm that tourism increasingly deserves attention and nurturing for higher growth.

Moving into the arena of developing nations alone, tourism outranks other industries within the export sector (UNWTO, 2018). The periods between 1995 and 2010 saw Africa's first major prosperity in tourism (UNWTO, 2011). The region received revenue from the sector to the tune of $3.7 billion in 2000 from $2.3 billion in the 1990s, representing over 50% growth (Fayissa et al.,

2008). This resulted from the increase of international arrivals from 6.7 million in 1990 to 26.2 million in 2000 (UNWTO, 2018), representing a little over three times the multiplier effect. Although the world experienced a net fall of 4.3% in tourism within the years of 2008 and 2009 because of the global financial crisis, the Sub-Saharan African (SSA) region experienced a growth in tourists by 3.7% (UNWTO, 2016).

Reportedly, the SSA region had 62.5 million arrivals in 2015 and contributed 9.1 million direct jobs which led to $39.2 billion in international tourism accruals (AfDB, 2016), far above the WTTC's prediction of 3.8 million jobs within 10 years (between 2013 and 2023), (Christie et al., 2014). According to Novelli (2015), tourism generates income for cultural heritage protection and biodiversity conservation. It creates a demand for non-tourism goods and services which include petrol, retail, transport, agriculture, real estate, and communication, thus, benefiting other sectors of the economy as well. Tourism also changes adverse notions about nations, employs the young, and empowers women (World Bank, 2011). Between 2000 and 2017, there was an increase of international tourist arrivals by close to 36 million, with the sub-Saharan region alone hosting over 24.7 million of these tourists (Signe, 2018).

Considering the kind of growth prospects the tourism sector holds for SSA and the benefits it generates for the region, coupled with other existing but unfulfilled tourism potentials such as diaspora, nature or adventure, beach, safari and cultural heritage tourism, and business travels, the SSA region irrefutably stands the chance of benefiting more from tourism as a vehicle of economic growth.

It is worth mentioning that to actualize the full growth potential that the tourism industry promises, the role of infrastructure in achieving the desired growth cannot be downplayed. Infrastructure here is defined as the provision of public safety, financial, medical and educational systems,

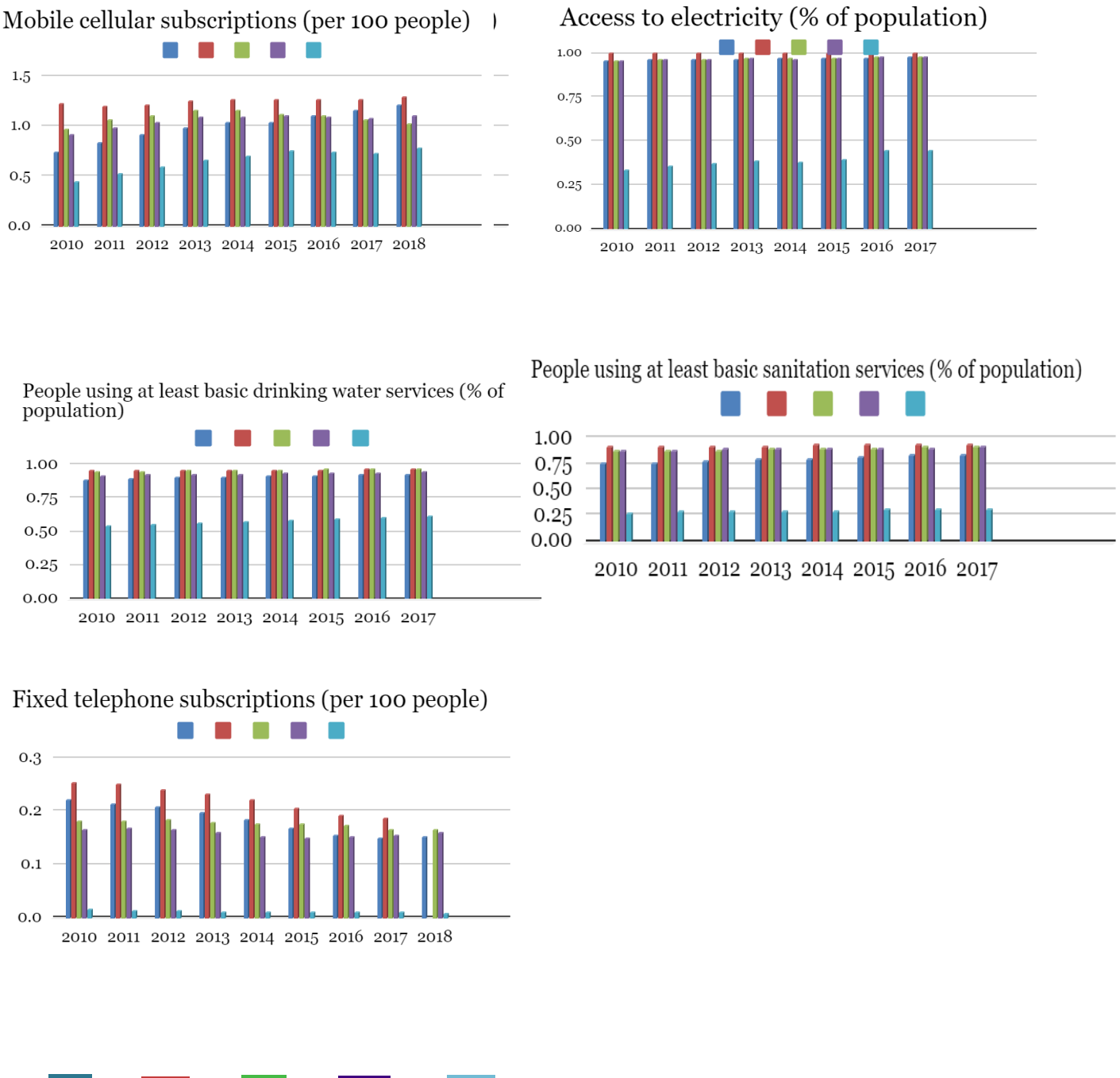
transport services as well as other services and tourist demand (Ritchie and Crouch, 2003). Some scholars have revealed that a key determinant in showing the attractiveness of a tourism destination rests on the infrastructure base of the country (Gunn,1988; Martin and Witt, 1988; Inskeep, 1991 among others). Also, higher levels of infrastructure development have the tendency to enhance the efficiency of production and also the distribution of tourism services (Jovanovic & Ivana, 2016). Again, the World Economic Forum on Africa 2019 points out that infrastructural development helps to accommodate needs related to tourism. Thus, countries with well-developed infrastructure have more capacity to handle tourism growth. Infrastructure developments; transport, utilities such as water, power, sanitation, telecommunication, sewage, and solid waste collection and disposal; are of primary importance and essential for a competitive tourism destination.

1.2 Problem Statement

Singe (2018) points out some of the challenges restricting the tourism sector from realizing its full growth to be hazardous roads, expensive and unstable electricity, poor access to emergency services, inadequate water supply, poor sanitation, and other infrastructure. Unfortunately, SSA lags in investment in infrastructure with many of the countries in the region having dissipated and inefficient infrastructure services (Jerome, 2011). Also, Jerome (2011) and Kondongo and Ojah (2016) reveal that the SSA region in terms of the quality of infrastructure and service delivery lags behind as compared to other developing regions.

The graphs below support this argument by comparing Sub-Saharan Africa (SSA) with other developing regions namely, East Asia & Pacific (EAS), Europe & Central Asia (ECA), Latin America & Caribbean (LCN), and the Middle East & North Africa (MEA) from 2010 to 2018.

Figure 1.1: Trend of SSA's Infrastructure compared with other regions



Source: Author's construction using WDI Data

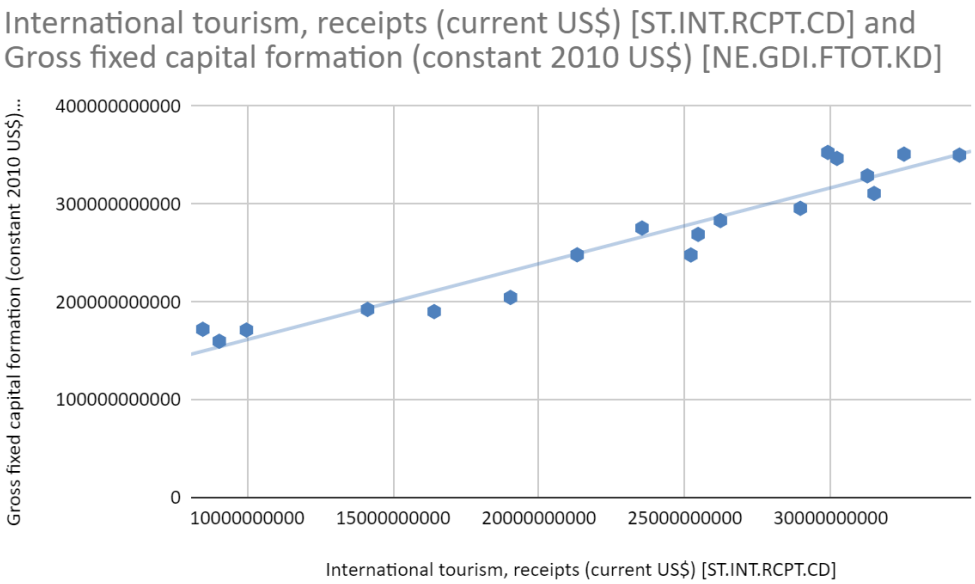
From the figure above, we can clearly see that the SSA region trails behind its peers on every key metric. For instance, the fixed telephone subscriptions for the SSA are somewhat stagnated over time below 0.02 subscriptions per every 100 people as compared to her other developing counterparts, which float above 0.1 and for some, 0.2 subscriptions per every 100 people. This translates into the fact that, out of every 10,000 samples selected within the SSA, only 1 person is likely to own a fixed telephone subscription per the construction above. The existence of telecommunication services in tourist destinations serve as major attractions for both investors and tourists. This means that, with such low indices, the SSA region becomes less attractive to investors and tourists than her counterparts in other regions.

The poor service is also evident in the energy sector (access to electricity) where the 48 SSA countries with about eight hundred million citizens collectively produce as much power as Spain, having just a fraction, that is, about 1/18 of the regions' population (AICD, 2009). When it comes to water resources, although the SSA region has ample of that, it happens that these resources are underdeveloped and underutilized, as such only 5% of agriculture is under irrigation (African Union, 2014). Data from UNICEF further confirms that compared with an average of 66 percent for the less developed countries, SSA's access to improved drinking water is 64%, still lagging behind its counterparts. To meet the increase in demand from sectors like agriculture, tourism, power, and transport, there has been a call for increased development of water resources by the Africa Water Vision 2025 projecting a 10% increment by 2015 and 25% by 2025. The annual funding here is approximately $11 billion (AfDB, 2011).

In addition, taking a look at some other aspects of the region's infrastructure, for instance, the transport sector, according to African Union (2014), SSA's road access rate is only 34% as against 50% in other developing regions and the regions transport cost are also 100% higher than in other

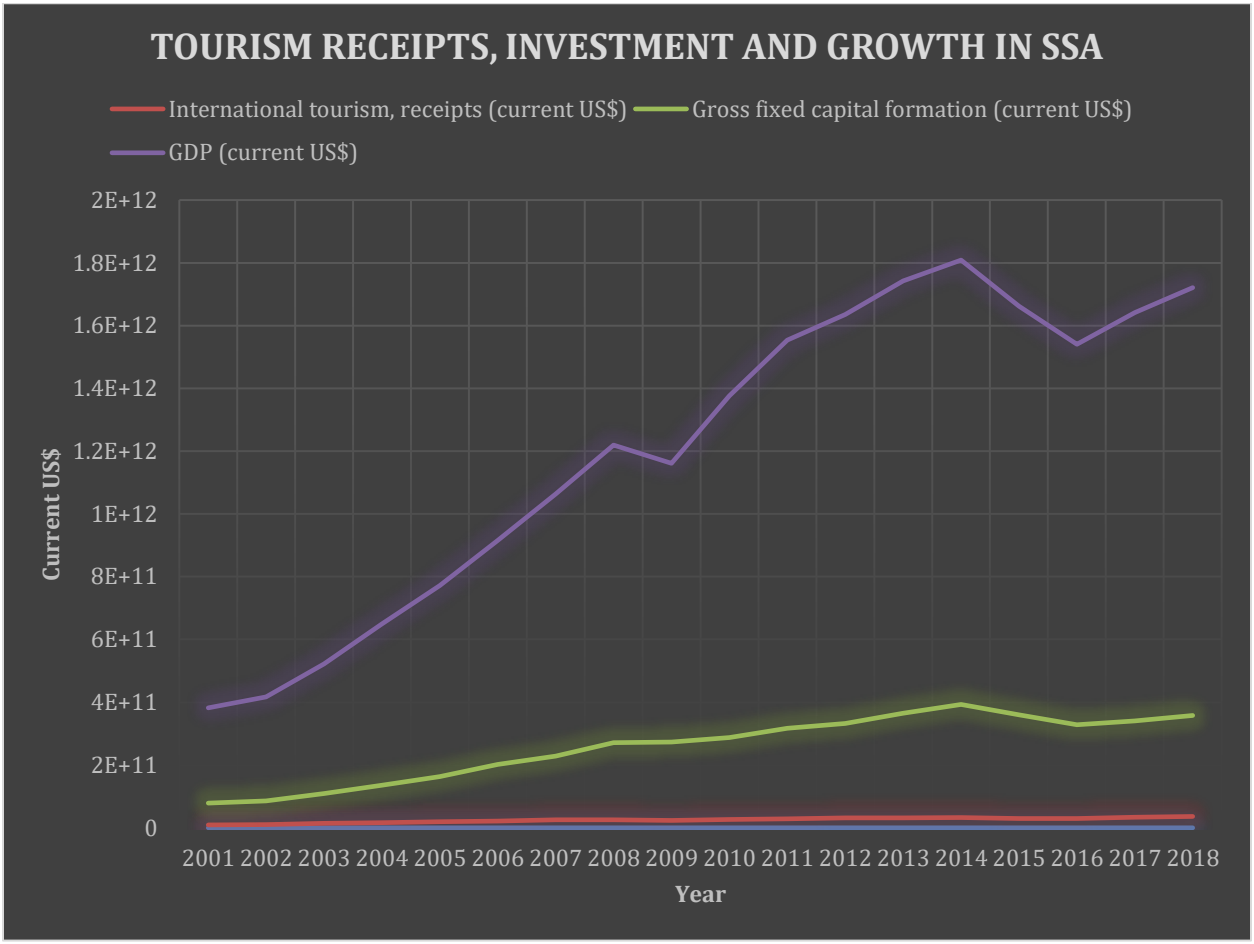
regions. Also, regarding internet penetration, it is estimated that SSA regions' internet rate of penetration was 6% in 2012 which is way below the average penetration rate of 40% of the developing region (African Union, 2014). Overall, the yearly investment need estimated for the regions' ICT sector (covering broadband service) is USD 9 billion. This includes an amount of USD 2 billion for maintenance (Foster and Briceno-Garmendia, 2010). According to Kumo (2012), developing countries' future investment need far exceeds the current amount being spent by their Governments and even the Private Sectors as well, creating a significant financing gap. The aforementioned affirms the huge infrastructural development and funding need of the SSA region. Perhaps, if investment in these infrastructure was appreciable, development in physical infrastructure would have been better than we see above. According to Kondongo and Ojah (2016), policy makers and also growth economists have pointed out that should under-investment in infrastructure continue, development efforts in other economic sectors (like tourism) might be derailed, adversely affecting economic growth. This indicates how remarkable infrastructure financing is in tourism and also for long-term growth to be realized. Even taking the period under review, the figure below shows a positive co-movement between gross fixed capital formation (constant US$), our investment variable, and international tourism receipts (Current US$) (also, the slope, measuring the degree of influence between these two variables, as shown in the lines of best fit in the graph, depicts a seemingly appreciable and investigable relationship).

Figure 1.2: A scatter plot showing the relationship between Investment in Infrastructure (GFCF, constant 2010 us$) and International Tourism Receipts (current US $) in SSA, Year 2000 – 2018.



Source: Author's Output with WDI data

Figure 1.3: A graph showing the trend in Investment in Infrastructure (GFCF, current US$), International Tourism Receipts (current US $) and GDP (current US $) in SSA, Year 2000 – 2018.



Source: Author's Output with WDI data

The graph above also shows a constant trend in investments over the year range under review despite some occasional shocks. While this happened, GDP was experiencing a steady upward trend until the period between 2008 and 2009 where investments fell to its lowest points, with 2009 having the hardest hit.

With the tourism receipts also showing a constant trend and an appreciable increment over the stated period, the growth prospects the sector holds for the region is somewhat confirmed by the

trend. However, given that tourism could thrive on the infrastructure that supports it, it becomes imperative to look at how investment in infrastructure enhances tourism's effect on economic growth. This study seeks to investigate that.

According to the Africa Tourism Report in 2013 and Buckley and Mossaz (2018), the main sources of finance for the tourism sector are first, the government's budgetary resources and then, the private sector through its investments in marketing, tourism services, and infrastructure among others. Supplementary financing for the sector comes from NGOs that represent local communities in giving out land and other facilities required for the sector's development (Christie et al., 2014). While these sources of financing have improved infrastructure to this point, more is needed to also curb the region's infrastructural deficit (defined as the infrastructure investment need and the poor maintenance of existing infrastructure) restricting the tourism sector from realizing its full economic potential. The estimated financing requirement to close the infrastructure deficit of Africa amounts to USD 93 billion annually until 2020 (AfDB, 2011). In 2018, however, the AfDB reported new estimates of $130–170 billion in annual infrastructure investment needs for the SSA. This estimate is approximately a $40-80 billion increase in infrastructure deficit, implying that the current investment needs are far higher than was previously estimated (AfDB, 2018). In 2011's report, the financing gap recorded was $31 billion which soared to a range between $68–$108 billion in 2018. This confirms the need for more investment to curb the SSA's infrastructure deficit as previously stated and to improve the quality of infrastructure and service delivery.

Besides the huge infrastructural development and funding need, even with respect to the literature on infrastructure development and tourism, the research available is very limited with the existing ones centered on Europe (Albaladejo et al., 2014), Asia (Boers & Cottrell, 2007; Bagheri et al., 2018; Mustafa, 2019) and the Americas (Judd, 2015). Majority of these studies have focused

mostly on specific countries (Tang & Rochananond, 1990; Khadaroo & Seetnah, 2007; Mandić et al.,2018, Wallace & Kilili, 2018) leaving the sub-continent like SSA and even continental level like Africa with not much evidence. The majority of these studies have found a positive relationship between infrastructure development and tourism confirming that tourism thrives on its supporting infrastructure and therefore, concluding that any investment in infrastructure will yield positive growth in tourism (Naudé & Saayman, 2005; Adeola & Evans, 2020). However, more of these studies have failed to critically look at how this growth in tourism emanating from investment in infrastructure translates into economic growth as a whole and that forms a focus of this study.

Furthermore, there is a host of information on tourism and growth in developing countries over the decades. A number of these studies have been conducted outside Africa and mostly at country-specific levels (Kreishan, 2015; Durbarry, 2004; Vanegas and Croes, 2003; Albaladejo et al., 2014) and some of these studies have also been conducted in Africa and at a sub-continental level like SSA (Fayissa et al., 2008; Makochekanwa, 2013; Nene & Taivan, 2017; Uduji et al., 2020; Nyasha et al., 2020). However, the coverage of tourism-growth nexus studies in Africa and especially in SSA still remains insufficient and as such, this study contributes to the literature in that regard. Also, taking into account the fact that the majority of these studies have confirmed the tourism-led growth hypothesis, it is still worth testing for a region like SSA, whose tourism sector holds higher growth prospects (taking into consideration, the increment in international tourist arrivals and the appreciable export gains coming from tourism accruals for the region in the last two decades).

1.3 Research Objectives

The main objective of this study is to investigate the impact infrastructure investment has on tourism and how this translates into economic growth. Specifically, the research seeks to

i. To investigate the impact of infrastructure investment on tourism in SSA.
ii. To investigate the impact of tourism on economic growth in SSA.
iii. To investigate the impact of tourism on economic growth through investment in infrastructure in SSA.

1.4 Research Questions

In order to achieve the objectives of this research, the study will use these questions as guides;

i. Does Infrastructure investment bring about growth in tourism in SSA?
ii. Does tourism promote economic growth in SSA?
iii. Does infrastructure investment enhance tourism's impact on economic growth in SSA?

1.5 Justification of the study

The study chooses to focus on SSA because of the massive growth prospects the tourism industry holds for the sub-region in terms of its current contribution to GDP; contribution to job creation, income generation, alleviation of poverty, and promotion of general economic activities. Also, the lack of investment and inadequate infrastructure being a restricting factor for the SSA region's tourism growth makes it necessary to ascertain for the sub-region, whether given investment in infrastructure, tourism as a sector, and its growth prospects will be enhanced.

Finally, the tourism-led growth hypothesis follows the logic that investment in the tourism sector leads to general economic well-being for tourist destinations. This means as the sector enjoys increased demand, the economy experiences increased infrastructure which leads to reduced cost of production, ultimately driving the general economic well-being. Kumar et al. (2015), therefore, argue that tourism infrastructure is a necessary requirement for growth if this hypothesis is valid. As such, Kim et al. (2006) postulate that government resources should be allocated to developing infrastructure in general which they believe is the beginning of the cycle for tourism-led growth hypothesis. This reveals that investment in infrastructure is key so long as tourism's contribution to economic growth is concerned or better put investment in infrastructure can affect the kind of impact tourism has on economic growth. So, a much relevant way of looking at the tourism-led growth hypothesis is by considering an investment in infrastructure which this study seeks to test.

Therefore, following all these lines of arguments, it becomes necessary to first, investigate in the case of SSA, the kind of impact investment in infrastructure has on tourism, further investigate and establish the impact tourism has on economic growth, and finally ascertain the kind of impact tourism has on economic growth given investment in infrastructure.

1.6 Significance of the study

The dearth of literature on SSA in terms of infrastructure development, tourism, and economic growth produces a crippling uncertainty of what Africa holds and the potential the region has. This research will be relevant in the following ways:

In terms of academia, this research will serve as a bulk of knowledge for both students and tutors to feed the relevant knowledge on what SSA holds, how tourism is necessary for the development of the region, and why infrastructure investment should be prioritized in SSA. It will serve as a

learning material for educationists and broaden their understanding of how infrastructure investment relates to tourism and the implications of these for the general economy. This research also serves as an addition to the existing literature on tourism and economic growth in SSA but this time considering how infrastructure investment contributes to ensuring the higher growth the tourism industry promises. The findings of the study would inform governmental, non-governmental, and even international bodies on how funds should be allocated for infrastructure development and which areas of the development should be considered to promote tourism and general economic growth. Thus, the study serves as an important hinge for policymaking.

1.7 Chapter Outline

Chapter one defines a general introduction and background to this study. It defines the main problem for which the study is of relevance, gives a concise definition of the author's main objectives, and the research questions the study wishes to answer. The significance of the study is also highlighted.

Chapter two provides an extensive literature review of both theoretical and empirical kinds of research done in line with the author's objectives while presenting the loopholes which make this research of much relevance and of pertinent addition.

Chapter three describes the methodology carried out for the study stating the reasons for each choice made by the author.

Chapter four discusses the findings of the study and how they relate to previous works done in this area. The final chapter contains a general summary of the work, the conclusions reached, and further makes recommendations for further research, policymaking, and regulation formulation.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This section covers the definition of the three main concepts of study in this paper, which are Infrastructure investment, Tourism development, and Economic growth. It is followed by an overview of the various theories and models developed around the concepts understudied in this research. Subsequently, a conceptual model and theoretical frameworks are established, followed by an empirical review of the relevant literature based on the purpose and aims of the project.

2.2 Definition of Key Concepts

Infrastructure Investment

Combining the various form the term infrastructure can take, it is apt to juxtapose it to any tool (visible or invisible) that contributes to the production of goods and services in an economy. The AfDB in the 2018 publication of the African Economic Outlook, loosely postulated social and economic infrastructure as two forms of infrastructure. The former covers such tools as schools, hospitals, training centers, offices, etc; while the latter encapsulates the differing daily support structures needed for sustainable living such as clean water, transportation, internet, electricity, and so on. To buttress, Frischmann (2009) believes that the term infrastructure refers to man-made physical resource systems which are to be used by the public, He, however, distinguished three main aspects of infrastructure as Commercial, Public and Social infrastructure. These classifications were made based on the kinds of goods that the infrastructure was used to produce where the first group was made of infrastructure used to produce private goods. The second, which

is public infrastructure, is used to produce public goods such as the internet, ideas, etc. Finally, social infrastructure is used to produce non-market goods and examples of this infrastructure are lakes, road systems, the Internet, etc.

The access and availability of infrastructural facilities are exigent for economic growth at a very basic level because the employment of these facilities influences productivity outcomes; which is in consequence a determinant of GDP. The AfDB (2018) expounds the importance of infrastructure with the following:

"Poor energy quality, for example, can impose additional costs on firms such as idle workers, lost production, or damaged equipment. But modern transport systems could increase manufacturing competitiveness cheaply and quickly, moving raw materials to producers and manufactured goods to consumers."

Gravito and Alli (2017) cited about $50 trillion as of the global infrastructure needs through 2030. This value is huge in the face of declining global investments. In SSA, governments are taking strides to address deficiencies in laws that inhibit private investment having realized the magnitude of need at stake. Of the 48 countries in the region, 42 of them have actively opened doors to support private investment in infrastructure (Gravito & Alli, 2017).

The UN also divides infrastructure into two forms; soft and hard, based on the destination of the investment made with them. For those investments whose outputs produce physical results like building roads, constructing irrigation systems, or making more robust telecommunication network systems, they are classified as hard infrastructure. Soft infrastructure thus is used in reference to the "institutions in which the hard infrastructure is embedded". For instance, soft

infrastructure would cover "human and social capital, knowledge, inclusion, social innovation, participation and equality" (González-Reverté, 2019).

While the continent lays more emphasis on agricultural development, the AfDB (2018) postulates that it needs more industrialization in order to meet its economic and development goals. Having identified power, transport, and water as the prime areas which need to be focused on to bring the region at par with other industries in other continents in terms of economic growth, it becomes more crucial to focus monetary injections into these areas. The AfDB (2018) documents that, of the $130 to 170 billion a year needed for Africa's infrastructure development, approximately 55 percent of that is met yearly from the previous low of 33.3 percent leaving more room for further capital injections.

Tourism

While the concept of tourism has no universally accepted definition, just as for infrastructure, it is widely accepted that the basis on which each definition is founded is common to all. Historically, the first-ever definitive set of words used to describe Tourism was by Guyer and Feuler in 1905. They defined tourism as:

"*dependent on the people's increasing need for a change, recognizing the beauties of nature and art and the belief that nature gives happiness which helps nations thanks to the developments in commerce and industry and the communication and transportation tools' becoming excellent*".

However, the first academic definition of the term was created by Herman von Schullern in 1911. He defined tourism as "*the sum of operations, mainly the economic ones which are directly connected to the entrance, permanence and displacement of foreigners in and out of a country, city or region*" (Wahab, 1977).

Over seventy years down the lane, the Tourism Society of England towed closer to this thought when they defined Tourism as "the temporary, short-term movement of people to destination outside the places where they normally live and work....". A few years before this definition was published, Fuster (1971) hinted that the world tour has its origins in Hebrew and relates to the concept of exploration, discovery, or recognition (Netto, 2009).

Several years later, Netto (2009) reveals how limiting and biased the varying definitions for tourism have been over the years exposing how most authors of articles and research material in the field have no scholarly background in the field and thus, give a biased view of the concept based on their field of study. He expresses how the UNWTO definitions are restricted to politics, commerce and "normative principles" thus, not accounting for the entirety of the concept.

Similarly, Tribe (2009) agrees that tourism is a rather complex theory whose definition has seen varied limitations. They define tourism "*as a short-term movement of people to places some distance from their normal place of residence to indulge in pleasurable activities. It may also involve travel for business purposes"*. The difficulties involved in getting a simple definition for tourism were identified with some of these reasons. As Netto (2009) postulated, tourism does not include business tourism where people travel for business and not for leisure-- tourism is meant to be for leisure rather than business. There is also the difficulty in ascertaining the necessary distance that ought to be travelled in order to count for tourism or how long one must stay away on travel to pass for a touristic experience.

Further down the lane, the notion of tourism being for fun, not business became obsolete due to the restrictiveness it came with. Businesses that bloomed from tourism were now given less attention, which gave rise to diminishing returns from those sectors.

In light of this, and the general confusion that came with defining the concept, the UNWTO in 1991, organized the International Conference on Travel and Tourism Statistics which Netto (2009) affirms created definitions for the sector, recognizing it as an economic sector.

"*Tourism is a demand-side phenomenon...defined as the activities of persons, identified as visitors...traveling for pleasure, business, health, education or other purposes. Tourism comprises the activities of all these categories of visitors.*"

Economic Growth

Simon Kuznets defines economic growth of a nation as the "long term rise in capacity to supply increasingly diverse economic goods to its population, this growing capacity based on advancing technology and the institutional and ideological adjustments that it demands" for the purposes of this study, it is expedient to note the terms "advancing technology". Simon signals that advancing technology is the permissive source of economic growth, but is in itself not sufficient for economic growth, although a necessary condition. This highlights the importance of infrastructure in economic growth. His definition is not lost on the natural resources that a nation possesses. He posits that some countries may experience economic growth because they possess some natural resources "exploitable" by other nations in order to drive economic growth.

Lukasz Pietak's work on "Review of Theories and Models of Economic Growth" also poses really insightful perspectives on the concept of economic growth. Highlighting that, there are usually uncertainties in the definition of the concept because as a concept or mark of prosperity, Economic growth falls short in the representation of ground conditions in a nation. It is a measure of output in the formal sector only and does not consider the black market outcomes. Furthermore, the concept officially does not consider "time spent on work which obviously affects the welfare of

the society". The state of the society, in that, the negative processes involved with economic activities and the impacts it has on society are not considered yet are of prime importance if production outcomes are going to rise or fall (Pietak, 2014).

While classical economists like David Ricardo and John Stuart Mill saw the determinants of economic growth to be investments and improving production capacities, neoclassical economists were steady in labelling land, labour, and capital as the main economic drivers. Pietak's work points out how the neoclassical belief explained the root of growth in capitalist economies. While Solow (1957), much like Kuznet believed technological advancements was a main augmenting variable in economic growth, Sala-i-Martin (2001) maintained that first, accumulation of physical capital, human capital and education, secondly, the diversity of institutions favorable to the economy, and lastly the free movement of capital, technology, ideas, foreign investment and the free flow of information were the key to economic growth (Sala-i-Martin, 2001)

The third highlight of Sala-i-Martin's proposition points to free flow-- which is in present terms a form of tourism, as well as improved infrastructure (both social, private, or public) as key reflectors and stimulants of economic growth.

2.3 Review of Theoretical Models and Concepts on Tourism and Growth

2.3.1 The Keynesian multiplier

To explain the relationship between tourism and growth, the Keynesian theory of multiplier is of relevance. According to Keynes, "*a change in an injection into the Circular Flow of Income (either investment (I), government expenditure (G) or exports (X)), will lead to a proportionately larger change (or multiplied change) in the level of national income i.e. the eventual change in national income will be greater than the initial injection of* spending". This theory holds a firm belief in the

multiplication of income once there is a change in the source of injection into the Circular Flow of Income. The theory believes that, regardless of the kind of expenditure, once there is an increase in income and employment or other such indicators of growth, the multiplier effect is true.

International tourism forms part of the aggregate demand that positively affects employment, income levels, general infrastructure and so on which in turn generates growth in the economy (Albaladejo et al., 2014; Kumar et al., 2015; Suresh & Senthilnathan, 2014). It is believed that improved tourism increases a nation's competitiveness and over time, Balaguer and Cantavella-Jorda (2002) have proven how tourism serves as a buffer for trade imbalances. A number of literature furthermore believe that the multiplier effect of tourism leaks into other economic sectors namely, construction, transportation, textiles, and agriculture (Crompton, Lee & Shuster 2001; Tyrrell & Johnston, 2001). This means the income generated from the above mentioned economic sectors are supported and generated by growth in tourism. This directly affects the *income* component of Keynesian theory.

Furthermore, from the definition of tourism given in section 2.1 above, tourism is widely regarded as forming part of a nation's export sector. Thus, from the theory above, any change in injection into the tourism sector (as an export sector) results in a larger change in income for the nation.

Kum (2015) however, identified a problem with this theory, that, its static nature does not account for the long term impact of tourism on growth.

2.3.2 Export-led Growth Hypothesis

Quite early in history, neoclassical economists having observed the burgeoning of free trade, or trade liberalism and outward-oriented policies began to agree on the export-led growth hypothesis (Shirazi & Manap, 2005).

This theory hinges on the claim that, when aggregate export leads to an increase in the inflow of foreign currency, there will be an increase in national income. Tourism as an economic sector falls within the export category, with the UNWTO confirming that some USD 1.3 trillion, thus 7% of the world's exports comes from the tourism sector. Internationally, the second-largest export sector was fuels and chemicals while tourism peaked in third place in 2016 (UNWTO, 2016). Vanegas and Croes (2003) therefore postulated that "the relationship between tourism exports and economic growth will be an indicator of the positive effect of tourism on economic growth" (Shirazi & Manap, 2005).

The growth channel of the export sector to an economy is hypothesized for the tourism sector as first of all, the inflow of foreign currency which consequently provides relevant aid for the economy's industrialization. Industrialization, on the other hand, has been identified by the AfDB as a major driver for growth in developing economies. This brings to the fore such necessary infrastructure as power, transport, and water whose proper and consistent functioning in the tourism sector will support the export-led growth hypothesis. (Lee & Kwon, 1995; Sinclair, 1998; Lim & McAleer, 2000; Sharpley, 2002; Mansfeld & Winckler, 2004))

2.3.3 Infrastructure-led growth theory

In 2009, Agenor proposed a theory of infrastructure-led growth hypothesis following several years of discourse and agreement on how a strong infrastructure background promotes economic outcomes. The theory is straightforward in that, he proposes "a long-run development based on infrastructure as the main engine of growth" in an economy (Agénor, 2006; Agénor, 2009; Wang, 2004). This theory relies on the advancement of infrastructure in terms of road or transport

delivery, health services, leading to a major improvement in standards of living. He identified that productivity outcomes are increased when infrastructure is better developed.

Against the backdrop of Yoshino (2008) for instance, who found that, if power cuts are more, it impacts negatively on the rate or volume of exports in sub-Saharan Africa, a clue of how infrastructure impacts an export sector like tourism becomes apparent. Where power disruptions, poor road networks, poor internet access, poor sanitation, and water conditions repel tourists and thus, adversely affect the aggregate export volume of the economy, leading to growth stall.

While the theory hinges on infrastructure as the main engine, it can be argued that, relying on infrastructure as a sole driver limits the gains the economy could attain from infrastructure development. We gain more if tourism is put into perspective when infrastructure development is considered. This then creates a dual-growth stream; one from infrastructure development and the other from the resultant tourism development.

2.3.4 Theory of Unbalanced Growth

In the late 1960s, a theory sprung up regarding the method of achieving economic growth. Hirschman then proposed a theory of unbalanced growth as a more sustainable way to economic growth rather than focusing on balanced markets. The theory argues that it is more "desirable" for an economy to channel its resources to selected investment avenues, holding to the belief that no LDC has enough resources to invest in multiple sectors at the same time without falling apart. The theory further maintains that the investment avenues must be strategically and deliberately selected, much as though the economy wishes to beat the system. The theory supports an "unbalanced" economy which would eventually lead to the balancing of other sectors as new investment opportunities are birthed from the few strategically carried out. The theory thus

supports investment in infrastructure or Social Overhead capital because of its broad yet indirect impact on the economy. Good infrastructure supports both human resources, natural resources as well as improves productivity outcomes through industrialization. Hirschman formulated grounds for identifying social overhead capital in a number of ways:

1. The service indirectly facilitates other economic sectors
2. They are global services and carried out by public and private institutions
3. They are provided at regulated fees or may even be at no cost
4. They cannot be imported
5. They are characterized by Lumpiness

(Srinivasu & Rao, 2013).

This theory, thus, sits perfectly with the ideology of investing capital in tourism infrastructure because, with such investments, all five conditions are satisfied and the benefits accrued spread to other sectors of the economy by increasing the standard of living, increasing the economic profile of the country, generating export revenues, encouraging employment and even leads to increased external capital injections in the economy.

2.3.5 Tourism Led Growth Hypothesis

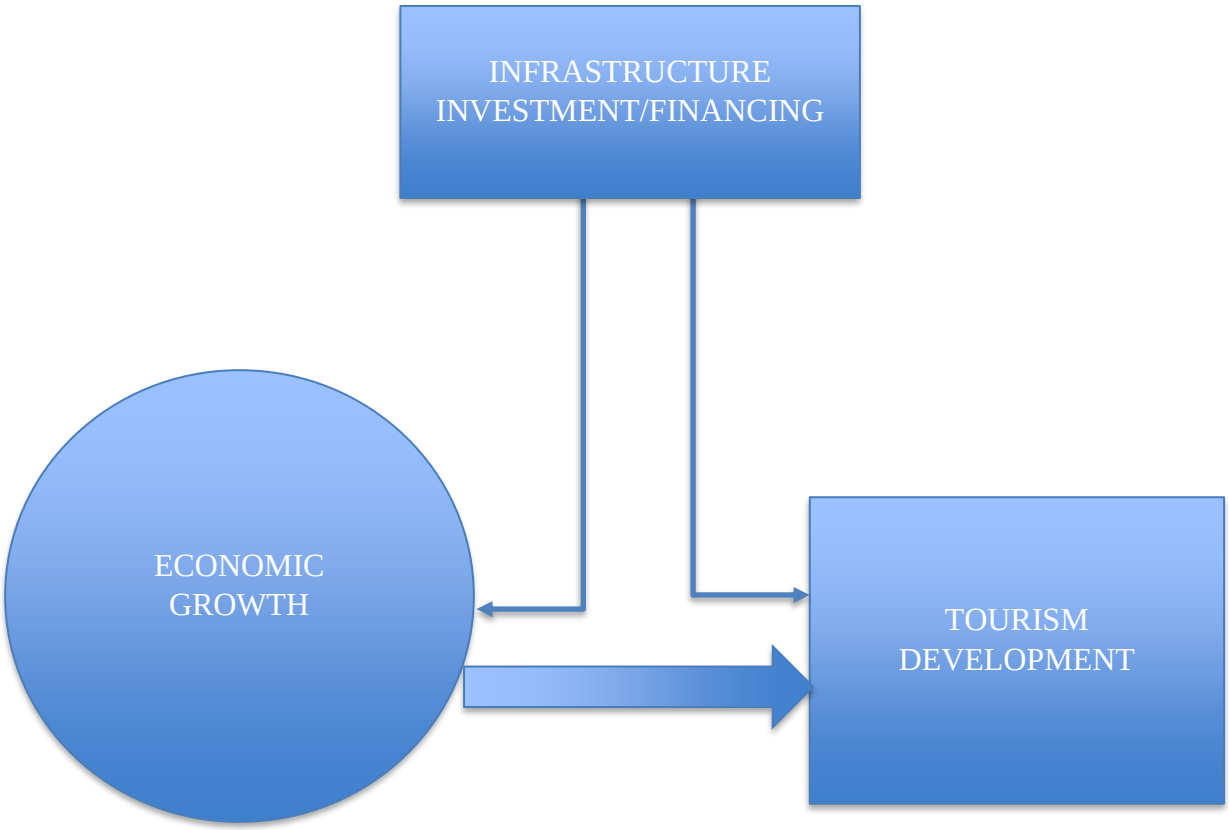
The TLGH was directly derived from the export-led growth hypothesis (ELGH). It postulates that economic growth can be generated not only by increasing the amount of labour and capital within the economy but also by expanding exports (Brida & Pulina, 2010).

For this hypothesis, there is an established acceptance of the role of tourism in determining economic growth. The revenue accrued from tourism increases foreign capital accumulation in an economy, while at the same time, serves as capital for producing goods and services for the economy (Brida et al., 2014). The theory follows this logic: When an investment is made in the tourism sector, local firms are encouraged to produce more because demand increases as more tourists are pulled to the country (Pavlic et al., 2015). This then leads to positive economies of scale in both the host country and other tourist destinations as the sector is enjoying increased demand, increased infrastructure, and less cost of production (Samimi et al., 2011). This means general economic well-being for tourist destinations, concluding the tourism-led growth hypothesis. Kumar et al. (2015) hinge on the premise of tourism led growth hypothesis to postulate that, if the TLG hypothesis is valid, then tourism infrastructure is required for growth as well (Kumar et al., 2015). Thus, government resources should be allocated to developing infrastructure, which is the beginning of this cycle for the tourism-led growth hypothesis (Kim et al., 2006).

2.4 Theoretical Framework

This section of the research portrays how infrastructure investment, tourism development, and economic growth interact in a pictorial view.

Figure 2.1: Theoretical Framework showing the interplay among Investment, Growth and Tourism Development



Source: *Author's own concept*

The concept portrayed in the diagram above seeks to affirm the author's convictions and the aims and objectives listed for the purpose of this paper. The framework above does not annul the impact infrastructure financing can have on the economy, as will be expounded in the empirical reviews below and explained conceptually in the theories above. To give a high-level explanation of how infrastructure investment would still promote economic growth in the absence of tourism development, there are other sectors of the economy like food, oil, and gas among others who require infrastructural injections. These other aspects also contribute to economic growth in their

own right. However, the low attention given to tourism as an economic sector necessitates that this untapped, yet highly lucrative sector receives more attention in terms of infrastructure to realize its full prosperity. Long-term projections by the WTTC suggest that the continent's tourist arrivals will continue to grow by 4.4% through to 2035; from 120 million to 280 million domestic and international travelers each year. This translates into billions of dollars in annual turnover. While there are diverse forms of tourism in SSA, continuous investment of the requisite infrastructure needed for their expansion is lacking and this inhibits the full growth potential of the industry and its implications for economic growth.

The framework proposed focuses on how interactions between infrastructure investment and tourism development affect the economic growth of the country. While investment in an economy's infrastructure raises the standard of living of the people in the country, this proposal does not overlook its importance. It simply echoes a more focused and intentional approach to tourism development.

2.5 Empirical Review

2.5.1 Review of Literature on Infrastructure Development and Tourism

On the basis of tourism and infrastructure, very limited research is available. While most of the research is centered on Europe, Asia and the Americas, very few of them point to selected countries in SSA and follow the point of view presented in this research.

In 1974, Gearing made use of a survey to study how Turkey; a tourist destination, made use of infrastructure. He found that facilities such as water, roads, electricity, health services, and others were of utmost importance in the tourist destination reaching its peak in growth. Not long after, Tang and Rochananond (1990) saw how relevant Thailand's infrastructure was in promoting their

tourism growth. 10 years down the lane, Kim, Crompton, and Botha (2000) studied Sun Lost City in South Africa and found similar results. In 2003, McElroy carried out a study of 51 islands. The study highlighted the importance of infrastructure, particularly government-financed, and how instrumental it is in the success of a destination.

Khadaroo and Seetanah (2007) also took to investigate more specifically, the importance of the transport sector infrastructure in tourism development and attraction. They modeled the Mauritius island as a case and by employing dynamic and static panel data estimation techniques, found that tourists (of American, Asian and European nationalities) were highly sensitive to even both transport and non-transport infrastructure. In 2008, they implemented a gravity framework to analyze the data among 28 countries over a period of 10 years (1990-2000) and found that, among the various forms of infrastructure needed, transport infrastructure proved most relevant. Mustafa (2019) looked through the same lens of transport infrastructure, but this time, on-road networks in Sri Lanka from 2005 to 2017 and found similar results.

Seetanah et al. (2011) provided a supporting trajectory to the fact that a nation's infrastructure development is a necessary aid to tourism development in the nation. They extended the international tourism development function to include infrastructure development. With Mauritius as the nation understudy, they found that, for international tourists, the infrastructural state of the island was of much relevance and played a key role in their destination choice. This feedback was common among the American, European, and Asian tourists visiting the island.

Das and Chatterjee (2017) make an assertion around the impact of infrastructure on tourism development using panel data estimations of 27 Indian States in a 10-year period (2005 to 2015). They revealed that the nature and type of infrastructure available in these states contribute

positively to tourism outcomes. They further prove tourism's influence on the economy as a whole. This then draws into the main focus of this research, which is that infrastructure development serves as a formidable driver for economic growth when it is focused on tourism.

Mandić et al. (2018) also explored the relationship between tourism infrastructure, recreational facilities, and tourism development. They made an analysis of the importance of these factors in the destinations understudied, which is Croatia. Major findings made support a positive relationship between the factors; tourism infrastructure, recreational facilities, and "number of arrivals, overnights" recorded. The results further proved increased demand for infrastructure investment.

For researchers like Naudé and Saayman (2005), Adeola and Evans (2020), the importance of relevant infrastructure cannot be over-emphasized as they also affirm a positive relationship for tourism infrastructure and growth.

The trends in these researches are obvious, tourism thrives on the infrastructure that supports it. As such, any investment in the infrastructure (to develop it further) will yield positive growth in tourism which in turn proves crucial to economic growth and development.

2.5.2 Review of Literature on Infrastructure and Growth

While it is common knowledge in the literature that infrastructure affects growth positively, SSA still lags behind in this development and an increasing number of observers agree to lack of necessary infrastructure as a major obstacle for growth and poverty reduction across the region (Calderon & Serven, 2010).

In 2001, Démurger explored the relationship between investment in infrastructure in China and the nation's economic growth. He employed panel data analysis of 24 Chinese provinces between 1985 and 1998 and observed that infrastructure development, as well as the geographical location of the provinces, proved invaluable in the economic growths experienced in the provinces. An important infrastructural element found was transport, as it was a key factor in creating economic differences. Strongly related to this is the finding by Doerr et al. (2020) over the period 2008-2016. The positive effect of transportation infrastructure on economic development was emphasized in their finding. Sahoo, Dash, and Nataraj (2010) found how infrastructure stocks among others promote economic growth in India. Making use of data available for 36 years, that is from 1970–2006. More importantly, much like Kodongo and Ojah (2016), they found that both public and private developments are supported by infrastructure development. Furthermore, their analysis proved that there is unidirectional causality from infrastructure development to output growth or economic growth.

Calderón and Servén (2010) make an analysis of the relationship between infrastructure and growth for more than 100 countries over the year range of 1960–2000. The analysis added to the literature on how growth and inequality are affected by infrastructure positively. From the findings, it was concluded that infrastructure development is an effective tool suitable for combating poverty.

More focused on Africa, Estache, Speciale, and Veredas (2005), provides evidence to support the theory of economic growth based on infrastructure. They implement an augmented Solow growth model to show how relevant infrastructure development is for growth in Africa and found a positive relationship between both variables. Thus, economic growth increases with more infrastructural development. Still, within the region, Kodongo and Ojah (2016) conducted a study

using panel data for 45 SSA countries over an 11year period which led to the findings on how infrastructural spending is very relevant for economic growth and development. Their study, however, did not capture how essential tourism as a sector, can be to the region's growth given spending on infrastructure. This study seeks to address this.

2.5.3 Review of Literature on Tourism and Growth

Makochekanwa (2013) discovered how tourism contributes greatly to Southern African Development Community (SADC) economies in terms of GDP, export receipts, investment, and employment. He found that, although this industry's impact varies among countries, Mauritius and Seychelles rely heavily on tourism to record higher growth in terms of economic activities. In both nations, the tourism sector yields approximately 28% and 60% towards total employment; 30% and 50% towards GDP; 34% and 35% towards export receipts; and 10% and 38% capital investment as a percentage of GDP respectively. They made some empirical approximations that buttressed the relevance of the sector toward growth in the region. It was realized that a percentage increase in tourism receipts created an effect of 0.16 percent rise in GDP per capita while the same percentage increase in tourism investment led to an increase of 0.29 percent in GDP per capita. The study thus confirmed among other things, the relevance of the tourism industry as a growth support medium for developing countries in SSA.

In 2015, Ravinthirakumaran implemented a Vector Autoregressive (VAR) framework to analyze the relationship between tourism and economic growth in Sri Lanka. Covering the period between 1968 and 2014, it was found that there was a "significant long-run equilibrium relationship" between the two variables and support the Tourism led-growth hypothesis in both the short and long-run.

Nene and Taivan (2017) examined the causality between tourism development and economic growth for 10 SSA countries. They employed an analysis of annual time series data for the period 1994 to 2014. They employed the use of cointegration analysis, vector error correction modeling, unit root tests, and Granger causality testing for each country included being studied. To check for potential inconsistencies that may arise from the indirect relationship between tourism and growth, they incorporated the use of the ratio of Trade to GDP and the ratio of capital formation to GDP in a multivariate setting. The results from their study showed that indeed growth is facilitated by tourism as this is supported by studies of 60% of the sample countries. Thus, 60 percent of SSA countries depend on tourism revenues in order to drive economic growth. They also found out that growth in itself drives tourism for 40 percent of the sample countries, confirming the growth-led tourism development hypothesis. This is also in line with a study by Durbarry (2004) which also confirmed the bidirectional causality from tourism growth and economic growth in the case of Mauritius. However, their study did not give an intentional approach to relaying how essential investment in infrastructure can be in enhancing the economic output of the region, and this study attempts to fill in this gap.

Dritsakis (2004), employing a Multivariate Auto Regressive model (VAR) in an investigation of the impact of tourism on economic growth in the case of Greece, also confirmed the tourism-led growth hypothesis. 10 years down the lane, Albaladejo et al. (2014), provided a peek into a forty-year relationship between tourism and economic growth for Spain and found results which buttress the tourism-led growth hypothesis at least during these years. Prior to this research, Balaguer and Cantavella-Jorda (2002) also analyzed how international tourism earnings impacted the Spanish economy and found the same results within the year frame of 1975-1997.

From 2008 to 2020, several other pieces of research with interest in this same area of analyzing the relationship between tourism receipts and economic growth were undertaken from across the world; 42 SSA countries (Fayissa et al., 2008), some selected developing countries (Sequeira and Nunes, 2008), Tunisia (Belloumi, 2010), and Malaysia (Kumar et al., 2015), Tang and Tan (2015) among others, SSA (Nyasha et al., 2020) over diverse span of years ranging from 10 to 15 to 30 years. These researches found the relevance of tourism for economic growth in the distinct regions they researched. However, Nyasha et al. (2020) found tourism's impact on economic growth to be significant for low-income SSA countries but insignificant for middle income SSA countries attributing the reason for the insignificance being economies moving towards a diversified economy (that is from primary economic activities to secondary and tertiary activities) as countries become more developed. The research mentioned above also utilized differing methodologies; GMM and fixed-random models, co-integration, elasticity coefficients, and causation of the variables by using the autoregressive distributed lag (ARDL) bounds and Toda Yamamoto causality analysis.

2.6 Conclusion

In summary, this chapter elucidates what and how the proposed theory of infrastructure investment, tourism, and economic growth will interplay to bring about the much-desired economic growth while leveraging the strengths of economic theories on the three main variables under study in this paper. This chapter conclusively enlists diverse empirical literature that covers the divulging themes in this paper.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

Chapter three of this study elaborates more on the methodology employed towards achieving the objectives explicitly identified earlier in the first chapter. The composition of this chapter includes the research design, target population, sampling and sampling technique, and econometric models with their component variables, the proxies used, and data sources. The chapter ends with a conclusion.

3.2 Research Design

The study will employ a quantitative research approach. This study makes use of quantitative research as it puts emphasis on the quantification of the data collection and analysis with its focus centered on gathering numerical data and generalizing it to make inference about a population.

3.3 Population

For this study, the targeted population in line with the topic and objectives include all forty-eight (48) countries within the SSA sub-region.

3.4 Sample and Sampling Technique

Out of the 48 countries in SSA, seven countries were not included in our analysis. These countries are Chad, Equatorial Guinea, Gabon, Liberia, Mauritania, Somalia, and South Sudan. They were dropped on the basis of data unavailability with respect to the main variables of interest. As such, the purposive sampling was adopted to select the remaining forty-one countries within the SSA sub-region as it allows the researcher to use his own judgment to choose respondents that provide the adequate information needed about the variable of interest (Kumekpor,2002). Thus, the

remaining forty-one countries were chosen mainly on the basis of data availability. Precisely, the quota used by the researcher was at least ten out of the nineteen observational data points (19 years of data, from 2000-2018) which means all forty-one countries included in the analysis, for all our main variables of interest have at least ten observational data points. This follows the rule of thumb employed by Asiedu (2002) and Adams (2009) that at least each country in the analysis must have as much data as possible on each variable of interest. Then again, the adoption of these criteria is important so as to eliminate all countries who will in the end have an insignificant impact on the analysis simply because of data unavailability (Wooldridge, 2002; Brooks, 2008).

3.5 Econometric Models Specification

Following the works of other researchers (Chen,2017; Tomohara, 2016; Khadaroo & Seetanah, 2008) on tourism development, the following augmented dynamic panel models was employed to tackle the first objective of the study which is to investigate the impact of infrastructure investment on tourism in the case of SSA. The different models capture the different measures of infrastructure quality used in this study. It is worth mentioning that the main aim of this model is to reflect the impact of infrastructure investment on tourism in the case of SSA. However, $FTS_{it,}$ and AE_{it} would be employed in this same model to replace MCS_{it} as alternative measures of infrastructure quality so that besides telling how essential the quality of infrastructure is for tourism development, we would be able to eventually tell which areas of infrastructure countries in the region could invest in based on the significance of these variables to our model.

$$\ln ITR_{it} = \beta_1 \ln ITR_{it-1} + \beta_2 \ln GFCF_{it} + \beta_3 \ln Y_{it} + \beta_4 \ln SEP_{it} + \beta_5 \ln ER_{it} + \beta_6 PSTAB_{it} + \beta_7 TO_{it} + \beta_8 FDI_{it} + \beta_9 CPI_{it} + \beta_{10} TNR_{it} + \beta_{11} MCS_{it} + \varepsilon_{it} \quad \text{(Equation 1)}$$

where $\varepsilon_{it} = v_t + \mu_i + \gamma_{it}$

To address the second objective of the study which seeks to investigate the impact of tourism on economic growth in SSA, the augmented dynamic panel model below was used following the works of earlier researchers (Nene & Taivan, 2017; Fayissa et al., 2008; Ravinthirakumaran, 2015);

$$lnY_{it} = \alpha_1 lnY_{it-1} + \alpha_2 lnITR_{it} + \alpha_3 FDI_{it} + \alpha_4 lnSEP_{it} + \alpha_5 lnER_{it} + \alpha_6 DC_{it} + \alpha_7 TO_{it} + \alpha_8 lnGFCF_{it} + \alpha_9 INSTQUA_{it} + \alpha_{10} TNR_{it} + \eta_{it} \quad \text{(Equation 2)}$$

where $\eta_{it} = \acute{y}_t + \acute{u}_i + \varphi_{it}$

Finally, following the works of Hassan et al. (2011), Menyah et al. (2014), Barro (1990), Nyamongo et al. (2012) and Fayissa et al. (2008) on the determinants of economic growth, the augmented dynamic panel model below is adopted to investigate the impact of infrastructure investment and tourism on economic growth. The model captures the independent impact of infrastructure investment and tourism on economic growth and also captures the interactive effect between infrastructure investment and tourism.

$$lnY_{it} = \mu_1 lnY_{it-1} + \mu_2 lnGFCF_{it} + \mu_3 lnITR_{it} + \mu_4 (lnGCFC*lnITR)_{it} + \mu_5 lnSEP_{it} + \mu_6 lnER_{it} + \mu_7 DC_{it} + \mu_8 lNSTQUA_{it} + \mu_9 TO_{it} + \mu_{10} TNR_{it} + \kappa_{it} \quad \text{(Equation 3)}$$

where $\kappa_{it} = \ddot{y}_t + \ddot{o}_i + \phi_{it}$

where for all the three models, the betas (β), alphas (α) and mius'(μ) represent the various parameters of the individual explanatory variables to be estimated. The subscripts i and t refer to the cross-sectional country dimension and time-series dimensions respectively. The composite error terms; ε_{it}, η_{it} and κ_{it} are decomposed into the country-specific effects and the remaining

disturbance error term with an expected average of zero, and a constant and finite variance over all periods under consideration.

Furthermore, Y_{it} and Y_{it-1} represent Gross Domestic Product per capita (constant 2010 US$) and its lag (1) respectively. Similarly, $lnITR_{it}$ and $lnITR_{it-1}$ denote the natural log of international tourism receipts and its lag (1) respectively. Also, $lnGFCF_{it}$ connotes the natural log of Gross Fixed Capital Formation (% of GDP).

The following are used as control variables within the individual equations following related models in literature: $lnER_{it}$ as the natural log of an annual average of the official exchange rate, local currency unit per US $; DC_{it} as domestic credit to the private sector, as a proportion of GDP; TNR_{it} also as total natural resources rent scaled by GDP; $lnSEP_{it}$ representing a natural log of secondary school education, general pupils, TO_{it} connoting the sum of import and export receipts all scaled by GDP; CPI_{it} representing consumer price index at 2010 constant prices; MCS_{it} as mobile cellular subscriptions (a measure of infrastructural quality), FTS_{it} as fixed telephone subscriptions per every 100 persons (also a measure of infrastructural quality); AE_{it} as Access to electricity (% of the population) also representing infrastructure quality, $INSTQUA_{it}$ as institutional quality and $PSTAB_{it}$ also as political stability.

It is also worth mentioning that for all the three models, a dynamic panel model is used for reasons that our dependent variables, tourism and Gross Domestic Product per capita (constant 2010 US$), are postulated to be self-reinforcing (that is, strongly dependent on their own lagged values). Intuitively, we expect previous years' tourism receipts and Gross Domestic Product per capita (constant 2010 US$) to influence today and future tourism receipts ($lnITR_{it}$) as well as GDP per capita (lnY_{it}) respectively.

3.6 Description of Variables

In this section of the study, our dependent and independent variables are theoretically defined and empirically justified. The units of measurements (proxies) for all the variables are stated and the sources of the data for each variable are clearly identified.

3.6.1 Dependent Variables

In line with the objectives of the study, two dependent variables; Economic Growth (lnY) and International Tourism Receipts (lnITR) are of interest here.

Economic Growth (lnY)

In this study, economic growth is measured using Gross Domestic Product per capita following Agbloyor et al. (2016) and Seetanah et al. (2011). The data is measured in constant 2010 US$. World Bank Database, the source of this data defines this variable as the gross domestic product scaled by the midyear population. To resolve the issue of heteroscedasticity and again control for the impact of outliers within the dataset on our analysis, we take the natural log of this growth variable (Brooks, 2008).

Tourism ($lnITR_{it}$)

To proxy tourism, international tourism receipts were used following the works of Butler (2010) and Obi et al. (2016). International tourism receipts are defined by the World Bank Database (source of data) as the expenditures made by foreign inbound visitors on their trip to and within a local host country capturing all payments to national carriers for international transport. The receipts also capture any other prepayment made for goods and or services received in the destination country. The data is measured in current US$. Again, to partially resolve the issue of

heteroscedasticity which could be present (owing to the fact that the SSA countries under the study have different economic, socio-cultural, political, and technological characteristics) and also to control for the impact of outliers within the dataset on our analysis, we take the natural log of our tourism variable (Brooks, 2008).

3.6.2 Definition of Explanatory Variables

Gross fixed capital formation ($lnGFCF_{it}$)

Gross fixed capital formation (% of GDP) which includes both private and public sector investment is used to proxy infrastructure investment following studies that have established its effect on economic growth (Kodongo & Ojah, 2016; Barro,1990; Fayissah et al., 2008). The World Bank Database, again the source of this data defines gross fixed capital formation (formerly gross domestic fixed investment) as including spending on “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". The relationship between this variable, tourism and economic growth is expected to be positive

Financial Development (DC_{it})

Domestic credit to the Private sector (financial resources provided to the private sector by financial corporations through loans, trade credits and other accounts receivables, which establish liabilities) is used to proxy financial development. The data was obtained from the World Bank Database. As far as literature on economic growth is concerned, financial development has received a lot of attention. For instance, Hassan et al. (2011) finds a positive relationship between financial development and economic growth concluding that financial development, thus, is necessary but

not sufficient to have a steady economic growth in developing countries. Also, Calderon and Liu (2003) also found in their study that financial development leads to economic growth with a stronger effect observed for developing countries than industrialized countries. Some other studies have however found a negative relationship between financial development and growth (Al-Malkawi et al., 2012; Jiao-Jiao et al., 2018). Adu, Marbuah, and Menasah (2013) also points out that whether financial development is either good or bad for growth depends on which indicator is used to proxy financial development. They, for instance, found domestic credit to the private sector as a ratio of GDP (which is also the proxy being used in this study) to be conducive for growth. While a proxy like broad money stock to GDP was found not to be growth-inducing. In view of these arguments, the researcher expects the relationship between financial development, tourism, and economic growth to be either positive or negative.

Natural Resources (TNR_{it})

Natural resource endowment is another variable found to have a significant effect on economic growth. With a region like SSA endowed with natural resources, it becomes necessary to look at the effect this variable has on tourism and economic growth in general. Unlike studies like Kolstad and Wiig (2012) which have used only total oil rents to proxy natural resources, this study uses total natural resources rent from WDI to proxy for natural resources following Owusu et al. (2016). The researcher deems it appropriate to use this proxy so as to be able to capture the full potential impact of natural resources on tourism and economic growth. Due to the mixed effects of this variable on tourism and economic growth in literature, the researcher also expects a mixed sign.

Foreign Direct Investment (FDI_{it})

The source of this data WDI defines Foreign direct investment as the net inflows of investment to achieve control and lasting management interest; a minimum of ten percent, in a business operating in a country other than that of the investor. Foreign direct investment, net inflows (% of GDP) are used to be able to capture the effect of other external sources of investment on tourism and economic growth following Choe (2003). Considering the fact that the effect of foreign direct investment on economic growth has been mixed, the researcher expects either a positive or negative relation.

Inflation Rate (CPI_{it})

Inflation refers to the general increase in the prices of goods and services in a country. The rate of inflation is measured economically by the movements in the consumer price index (CPI). According to the World Bank where the data is sourced, the consumer price index reflects changes in the cost to the average consumer of acquiring a basket of goods and services that may be fixed or changed at specified intervals, such as yearly. Inflation has the tendency to limit investments in all sectors such as the tourism sector translating negatively into growth by increasing the cost at which deficit units obtain capital from surplus units (Lin, 2003; Butler 2010, Obi et al., 2016). Thus, in using the consumer price index to proxy the rate of inflation, the researcher expects a negative relation with tourism and economic growth.

Human Capital ($lnSEP_{it}$)

The number of secondary school students enrolled in general education programs is used to proxy human capital in this study following Butler (2010) and Sonne et al. (2013). This proxy was chosen for the reason that the tourism industry in SSA is usually dominated by labourers with

different educational backgrounds, but are mostly middle-staged secondary school graduates. A number of economic theories (such as the AK model, Malthus-Ricardo Model, and others) have talked about the nexus between economic growth and population. This relationship varies depending on the level of population in terms of the quality and skills of the population, educational levels among others all constituting human capital. However, owing to the fact that countries with large populations are likely to experience huge market sizes that have the tendency to attract foreign investors and tourists, a positive relationship among human capital, tourism, and economic growth is expected in the case of SSA.

Infrastructural Quality (MCS_{it}, FTS_{it}, AE_{it})

Capital investments such as quality and accessible roads, airports, habours, stable electricity, access to water, ICT (mobile and broadband subscriptions) among others are very essential for tourism development as they tend to attract more tourists. As such in this study, we proxy infrastructural quality using the number of mobile cellular subscriptions per every 100 persons (following the works Adeola & Evans (2020) and Kumar & Kumar, 2019). We also proxy fixed telephone subscriptions per every 100 persons (following works of Agbloyor et al.,2014 and Asiedu, 2004) and finally, access to electricity (following Kondogo & Ojah, 2016). All these variables are sourced from WDI. These few variables were chosen to able to at least capture how essential the quality of infrastructure and service delivery is in improving tourism (increasing tourism demand) and to mainly tell some of the areas of infrastructure the region can pay attention to as far as investment in infrastructure is concerned. The researcher expects a positive relationship between infrastructural quality (MCS_{it}, FTS_{it}, AE_{it}) and tourism development in the case of SSA.

Exchange Rate ($lnER_{it}$)

The exchange rate is measured using the average amount of Local currency required to obtain a unit of US$ obtained from the WDI database. A number of studies have sought to establish the relationship exchange rates have with tourism and economic growth as well as other variables such as FDI. While some of these studies have established a positive relationship such as Jeon and Rhee (2008) and Ramiraz (2006), others found a negative relationship among these variables (Kyereboah-Coleman & Agyire-Tetteh, 2008; Webster & Okafor, 2015). In line with these studies, we also expect either a positive or negative result. For the reason that high exchange rate can result in the cost of living rising, adversely affecting savings, investments, and even trade activities, we expect the possibility of a negative impact on tourism and economic growth. On the other hand, also for the reason that high exchange rate (appreciation of the dollar) can make travel more affordable and thereby promote inbound tourism, we also expect the possibility of a positive impact on tourism and economic growth.

Trade Openness (TO_{it})

Trade openness is the sum of imports and exports normalized by GDP (Alotaibi & Mishra, 2014). As such, the sum of total imports and exports scaled by GDP is adopted in this study to proxy for trade openness following the works of Zhang and Daly (2011), Bitzenis (2003), and Agbloyor et al. (2014). Trade openness plays essential roles in tourism and economic growth. For instance, neoclassical economists argue that growth in export is the main driver of economic growth (Shahbaz et al., 2013, Helpman & Krugman, 1985). They point out that greater trade openness brings about higher economic growth rates. Following this line of argument, the researcher expects trade openness to have positive relations with tourism and economic growth.

Institutional Quality ($INSTQUA_{it}$)

The quality of institutions plays an important role in economic growth as it serves as an incentive structure for which economic activities may or may not increase. As developed by Kaufmann et al. (2011) and also following works by Agbloyor et al. (2016) and Owusu et al. (2016), institutional quality is proxied using the simple average of the estimates for the six main world governance indicators. These six indicators in question include Regulatory Quality, Rule of Law, Control of Corruption, Governance effectiveness, Political Stability and Absence of violence/terrorism, and Voice and Accountability. Findings of Yadzi et al. (2017), Agbloyor et al. (2016) have confirmed that institutional quality is necessary for economic growth. A positive relationship between institutional quality and growth is therefore expected by the researcher, all other things being equal. This implies that a country with an effective, well-developed, and uncorrupted institution has the tendency to ensure that its factors of production are put into more productive purposes which in turn leads to higher economic growth.

Political Stability ($PSTAB_{it}$)

The role of political stability in tourism and economic growth cannot be downplayed. The presence of chaos and violence in a country has the tendency to deter tourists from such countries but on the contrary, a country that is politically stable is likely to attract more tourists and generate more revenue as a result, hence its inclusion in our tourism regression model. According to the World Governance Indicators political stability measures perceptions of the likelihood of political instability and/or politically-motivated violence, including terrorism. In this study, the World Governance Indicators' country-specific score on the aggregate indicator, ranging from a scale of approximately -2.5 to 2.5 is used to proxy Political stability following the works of Kaufmann et al. (2011) and Owusu et al. (2016). In line with studies such as Asiedu (2004) and Agbloyor et al.

(2014) which have found out that economies that are politically stable tend to attract inflows of foreign capital which significantly and positively impacts economic growth, we also expect a positive relationship between political stability and tourism.

3.7 Diagnostic Test

To establish the appropriateness of the models, variables, and the estimation technique to be used in achieving the objectives of the study and also with the aim of ensuring that accurate, efficient, and reliable parameters are obtained, the undermentioned tests were conducted.

Stationarity or Unit Root Test

According to Brooks (2008), stationarity is regarded as more salient to time series analysis. However, Roodman (2006) advised its execution even in the case of dynamic panel analyses. Intuitively, by stationarity, we mean to say that the statistical properties in a stochastic process (which includes mean, variance, autocorrelation) are constant over time. In order to investigate the unit-roots status of the various variables used in this study, the Fisher test is used as employed also by earlier works like Khadaroo and Seetanah (2007). More importantly, we use the Fisher test because Choi (2001) recommends this test for use in situations where the panel data is unbalanced, and where the lags of the dependent variable are specified in the model as part of the regressors.

Endogeneity

Endogeneity refers to situations where the explanatory variables are correlated with the error term. According to Roodman (2006), the problem of endogeneity possibly occurs in model estimations when an explained variable potentially explains an explanatory or independent variable(s) otherwise known as reverse causality, it also occurs when independent variables that are important in our model estimation are excluded and when there are measurement errors in the variables being

used in our estimation. In such a situation, we expect the covariance between the error term and explanatory variable(s) to be unequal to zero.

Considering these possible causes of endogeneity, we can say that all three dynamic panel equations specified in this study for achieving our objectives possibly exhibit endogeneity, at least because of the expectation of reverse causality among some variables especially those of interest in the study. For instance, from equation 1, there is the expectation that tourism($lnITR_{it}$), our dependent variable can possibly explain and cause both economic growth (lnY_{it}) and FDI (FDI_{it}). Also, equation 2 and 3 poses the expectation that our dependent variable, economic growth (lnY_{it}) potentially explains tourism ($lnITR_{it}$), FDI (FDI_{it}), human capital ($lnSEP_{it}$), exchange rates($lnER_{it}$), trade openness (TO_{it}), financial development(DC_{it}) and also institutional quality ($lNSTQUA_{it}$). Also, the introduction of a dynamic term in our various equations suggests possible endogeneity.

Therefore, in line with Davidson and MacKinnon (1993) who recommends the test for endogeneity as a prerequisite test towards employing any estimation technique that makes use of instrumental variables as against the OLS and also following works of Baum et al. (2003) and Yokoyama and Alemu (2009), the Durbin-Wu-Hausman test for endogeneity is conducted for the error terms of the endogenous variables (tourism and economic growth) as a function of the exogenous variables. The presence of endogeneity in the equations will further confirm the appropriateness of System GMM for use as the estimation procedure and technique.

Autocorrelation and Heteroscedasticity

The presence of autocorrelation (otherwise known as serial correlation) and heteroscedasticity in a specified model is responsible for the persistent effect a single shock in data has on the future performance of the same phenomenon. Given the specified models in this study and the fact that

the dependent variables and their lags are expressed in terms of the country-specific time-invariant component of the error time, there is a possibility of autocorrelation in all three models understudy.

The Arrelano-Bond (1991) test in first difference errors will be employed to test for the presence of autocorrelation. This test is deemed appropriate as against the Durbin-Watson test for the reason that the estimation technique to be used in this study, System GMM does not only use the first lags of the endogenous variables as instruments in the estimation procedure as it is in the case of the Durbin-Watson test but also instruments the endogenous regressors with two or more lags. The requirement for System GMM is that the autocorrelation at the first order autoregressive process AR (1) should be significant and that of the second order autoregressive process should be insignificant AR (2). Furthermore, considering the fact that this study makes use of panel data consisting of 41 different SSA countries with different economic, socio-cultural, political, and technological characteristics, there could be a possible presence of heterogeneity which ought to be taken care of by using appropriate estimation techniques. Hence, the use of the System GMM as the main estimation technique.

Hansen Statistic

The Hansen J test and Sargan test of overidentifying restrictions are both used to test the null hypotheses of the overall validity of the instruments used in the estimation process. Failure to reject these null hypotheses provides concrete support for the choice of the instruments used. This study makes use of the Hansen test of overidentifying restrictions to evaluate the validity of the instruments used. In the case of system GMM, to prevent the consequential effect from too many instruments, this test validates the correctness in the levels of lags of the endogenous variables employed as instruments during the estimation process. The study, therefore, engages the Hansen test to evaluate the validity of the internal instruments used in the system GMM estimation

procedure. The test is distributed as a chi-square under the null hypothesis that all the instruments are valid. To fail to reject this hypothesis, we expect higher p-value results (that is greater than 0.05) for the Hansen tests else there will be a need to reconsider the models specified.

3.8 Estimation Technique

Although Ordinary Least Square Estimator (OLS) is a widely used estimation technique for most econometric analysis, Brooks (2008) explicitly describes the kind of data and model specification for which OLS can be used to get the Best Linear Unbiased Estimators (BLUE) that are consistent and efficient. Making inference from his description, data, and model specifications whose error terms are heteroscedastic, autocorrelated, multicollinear, not equal to zero, not normally distributed cannot be estimated by OLS. As such, some researchers (Lee, 2007; Wooldridge, 2009) have pointed out that data and models with such problems can best be handled using more robust estimations such as Random Effects Models (REM), Fixed Effects Model (FEM), Generalized Methods of Moments (GMM), Vector Autoregression Models (VAM), Vector Error Correction Models (VECM), among others, that have the tendency to correct the inconsistencies within the data and the models to achieve BLUE and efficient parameters. However, with the inclusion of a dynamic term in our model specification, the lagged dependent variable is likely to be correlated with the fixed effect component of the error term (unobserved heterogeneity). This can lead to inconsistent estimates of the lagged dependent variable. To solve this problem of unobserved heterogeneity, the first differences of the original model can be taken using the fixed and random effect model. It is important to note that, although the random and fixed effect models will eliminate the unobserved heterogeneity problem, the problem remains as there will still be a correlation between the differenced lagged dependent variable and the error term. Therefore, under these circumstances, the Generalized Method of Moments (GMM) is the best estimator as it

accounts for unobserved heterogeneity (by estimating the equation in first differences) and also accounts for possible endogeneity of the regressors (by instrumenting the endogenous regressors with two or more lags), (see Kusi et al., 2017).

Therefore, the study makes use of GMM as the estimation technique given that it yields more reliable and accurate estimates in spite of the presence of simultaneity biases and endogeneity. Again the study makes use of GMM as the only estimation technique for the reasons that it works for linear functions and in models where current performances of the dependent variable are affected by its past. It also works to eliminate heteroscedasticity and serial correlation (autocorrelation) in dynamic panel data and models. Finally, GMM is regarded appropriately in situations where the number of individual countries (in this case 41 countries) exceeds the number of periods, t, (in this case 19 years) in the panel.

Furthermore, there are two forms of GMM; difference GMM and System GMM (Roodman, 2006). However, this thesis makes use of the System GMM as the main estimation technique. This is because the difference GMM although able to correct endogeneity by transforming all regressors through differencing can produce not so accurate and consistent parameters for the reason that it subtracts the previous observation from the contemporaneous one thereby magnifying gaps especially in the case of an unbalanced panel (Arrelano & Bond, 1991). The system GMM on the other hand subtracts the average of all available future observations from the current value thereby minimizing the gaps that exist in the data. The system GMM is also preferred because it controls for endogeneity by introducing more instruments. Thus, improving efficiency. Finally, compared to the difference GMM, the system GMM builds a system of two equations which is a combination of the level and difference dynamic equations that improve upon the difference GMM by supplementing the equations in the first differences with the equations in the levels and also helps

with the correction of measurement errors in the regressors (see Arellano & Blover ,1995; Blundell & Bond, 1998). The System GMM has been shown to be more efficient in estimations, thus making it preferable to the difference GMM (Roodman, 2006).

More specifically, this study employs the two-step system GMM as the estimation approach for the reasons that it is more efficient and robust to heteroscedasticity and autocorrelation (Roodman,2009).

3.9 Data Type

The study made use of panel data. Precisely, an unbalanced panel data for the forty-one SSA countries over a period of 19 years, that is, from 2000 to 2018. Panel data was used because it captures both the variations in variables across time and variations among individuals at a point in time (Brooks, 2008). Thus, it captures both the time series and the cross-sectional variations. In addition, panel data was adopted because of its dynamic feature in allowing researchers to analyze how past observations of variables of interest affect current and future values and also for the fact that it ensures accurate conclusions (Mileva, 2007).

3.91 Data Source and Collection

Secondary data was used to address the objectives of this study. Secondary data refers to data originally collected for a different purpose and reused by another researcher for another research purpose (Hox et al., 2005). The proxies for all the main variables of interest (tourism, economic growth, and public sector gross fixed capital formation) as well as the control variables were all obtained from the World Development Indicators (WDI) database published by the World Bank. Given that an amount of literature has relied on this database, it is enough confirmation of its accuracy and reliability in addressing the objectives of the study.

Data sorting, cleaning, and all necessary computations were made in Excel after downloading the needed variables, and imported into Stata13 for further analysis. All the data transformations and composite variable generations were executed in Stata13.

3.10 Conclusion

This chapter has essentially specified the models to be used in addressing the objectives of the study, discussed and defined the variables of interest providing justifications for their use. Considering the characteristics of our data and models specified, the appropriate methods of estimation that were employed in the study are also stated with concrete reasons for their adoption. The data type, sources, and means of collection are also clearly stated here.

CHAPTER FOUR

RESULTS AND DISCUSSION OF FINDINGS

4.1 Introduction

This chapter presents the results and findings of the study. The summarized descriptive statistics and correlation matrix of our variables under study are discussed here. We will further discuss the pre-estimation, post estimation tests, and the results from the two-step System GMM estimation technique conducted with much emphasis on the variables of interest as well as those that are significant.

4.2 Descriptive Statistics

Table 4.1: Descriptive Statistics for Variables

Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
LnITR	694	18.668	1.879	11.513	23.139
LnY	771	6.986	.989	5.272	9.574
lnGFCF	688	2.94	.442	.092	3.959
FDI	769	4.147	6.057	-6.057	57.838
MCS	770	44.245	41.528	0	184.298
FTS	771	3.221	6.117	0	34.273
AE	719	36.874	24.688	3.098	100
DC	752	21.483	24.96	.403	160.125
PSTAB	779	-.491	.896	-2.699	1.282
INSTQUA	779	-.585	.61	-1.929	.88
TNR	731	10.735	10.328	.001	59.62
TO	719	71.237	35.478	19.101	225.023
CPI	699	99.922	45.119	2.909	382.501
LnER	759	4.79	2.347	-3.113	22.629
LnSEP	485	12.885	1.642	8.818	16.341

Descriptive Statistics (showing the raw values of the logged variables)

Table 4.11

Variable	Obs	Mean	Std. Dev.	Min	Max
ITR	694	5.522e+08	1.421e+09	100000	1.120e+10
Y	771	1890.785	2443.849	194.873	14385.302
GFCF	688	20.586	7.883	1.097	52.418
ER	759	8858406.2	2.440e+08	.044	6.723e+09
SEP	485	1122046.5	1760771.2	6753	12500000

The statistical features of our variables are shown above. The tables indicate the various variables used in the model, the total number of observations (Obs) for each, the mean, standard deviation (Std.Dev), minimum (Min) and maximum (Max) values for each of the variables used in this study as shown in the columns. From table 4.1, the maximum number of observations is 779 for PSTAB and INSTQUA implying that data on these two variables were available for all the 41 countries and for all the 19-year period of study. lnSEP, the proxy for human capital recorded the minimum observation of 485 with the observations of the other variables lying between these two extremes. Given these observations from the table, it is quite evident that the study employed an unbalanced panel data, which to some extent supports the use of the system GMM as the estimation technique. The table also reports the mean (as a measure of the central tendency and dispersions within the dataset) and respective standard deviations of each of the variables.

To begin with our dependent variables, the mean values of the natural logs of international tourism receipt (lnITR) and GDP per capita (lnY) are 18.67 units and 6.99 units respectively with the values of the natural log of international tourism receipts hovering around 11.51 and 23.14 units. From the original data, it was clear that a number of the countries from the year 2000 to 2017 saw constant increment in these receipts. These countries include Angola (from 17.34 to 20.59 receipts, Ethiopia (from 19.14 to 21.64 recepits), Madagascar (from 18.83 to 20.34 receipts) and Tanzania

(from 19.75 to 21.55 receipts). This comes to confirm that international tourism receipts have somewhat shown positive movements over the years and reveals the potential revenues the host countries can generate through the activities and operations of their tourism sectors. Also, the values of the natural log of GDP per capita as a measure of economic growth indicates that the SSA countries experienced a GDP per capita ranging from 5.27 to 9.57 units from 2000 to 2018.

From the raw values as shown in the second table (Table 4.11), Public sector gross fixed capital formation as a percentage of GDP (GFCF) has a mean value of 20.586% with its minimum and maximum value hovering around 1.097% to 52.41%. The net FDI values with a mean value of 4.15 % and minimum and maximum values hovering around -6.06% to 57.84% of GDP. Given the global average of Gross fixed capital formation to be 20%, an average of 20.586% in the case of SSA suggests that the investment in infrastructure for the region has somewhat seen some increments over the period under study. For instance, although a country like Sierra Leone recorded the least value of 1.097% in the year 2000, there was a massive increment to 30.72% and 41.54% about a decade later, that is, in 2010 and 2011 respectively. This is also confirmed by the country that recorded the highest value, Guinea of 52.418% in 2016, and had its lowest value of 14.2% in the year 2002. We make reference to the original data for all extra statistics stated here. The net FDI values also suggest that SSA countries have also experienced both positive and negative net inflows of FDI over the period under review.

For our infrastructural quality variables, the number of mobile cellular subscriptions (MCS) per every 100 people used to proxy infrastructure quality, had an average of 44.25%, went as low as zero and as high as 184.30% as compared to the number of Fixed telephone subscriptions which also had an average of 3.2%, went as low as 0 and as high as 34.27%. Relatively, the number of mobile subscriptions out of every 100 people sampled in countries within the region, saw an

increment over the period under review with countries like Ghana, Mauritius Namibia, Nigeria, Senegal, Seychelles, and South Africa experiencing higher subscriptions way above the average in the last decade (making reference to the original data) as compared with the fixed telephone subscriptions. Access to electricity had an average of 36.87% and minimum and maximum values ranging from 3.1 to 100%. Generally, the percentage of the population for countries in the region having access to electricity in the last two decades has seen an appreciable increment with countries like Botswana, Cabo Verde, Cameroon, Cote d'Ivoire, Seychelles and Ghana having a relatively higher percentage of their population having access to electricity in the last two decades. DC, representing domestic credit to the private sector as a percentage of GDP is the proxy for financial development with an average of 21.48% which went as high as 160.13% in periods when high credit is made to the private sector and as low as 0.40% in periods where credit demanded and given to the private sector is very low.

Political Stability (PSTAB) records a mean of -0.49. This means that on average the levels of political stability experienced by countries within SSA is not appreciable and further confirmed by a worse minimum value of -2.69 (for some countries like Congo, Gambia, and Angola) and a rather low yet maximum value of 1.28 (for some countries like Mozambique and Ghana).

The recorded average of our institutional quality (INSTQUA) variable is -0.58 with minimum and maximum values being -1.93 and 0.88 respectively. This reflects that most countries within the SSA region had poor or weak institutions over the period under discussion. Countries within the region that somewhat have good operational institutions (with reference to their maximum values although below 1), include South Africa, Namibia, Cape Verde, Seychelles.

Total natural resources (TNR) also have a mean value of 10.74% with the values as low as zero percent and as high as 59.62%. Computing the average for some other developing regions like the

Latin America & Caribbean, Middle East & Africa, Europe & Central Asia and East Asia & Pacific using data from WDI, results obtained were 5.32%, 24.89%, 1.76% and 2,38% respectively. This reflects appreciable revenues being generated from natural resources in the SSA region next to the Middle East & Africa and also confirms works of Asiedu (2005), Asiedu and Lien (2011) which have pointed out that most countries within the region rely heavily on revenues derived from their natural resources.

Trade openness, (TO) which is the sum of imports and exports scaled by GDP recorded an average of 71.24% with a minimum value of 19.10% in periods of low imports and export activities and a maximum value of 225.02% in periods of high imports and exports activities.

The Consumer price index was employed to proxy inflation with an average of 99.9 points and maximum and minimum values of 382.5 and 2.909 respectively. This indicates that during the period under study, inflation rose to almost 382.5 points for some countries within the region like Ghana, Guinea, Malawi, and Sudan (from the original data) which have high inflation records.

Exchange rate (lnER) averages as 4.79 units with a maximum value of 22.63 currency units in periods where there is a depreciation of the local currencies as against the US dollar, and a minimum value of -3.11 units in periods where the local currency strengthens as against the US dollar.

Finally, human capital development measured by the natural log of secondary school enrolments (lnSEP) indicates an average of 12.89 units. The level of human capital development in the region is expressed with a minimum value of 8.82units and a maximum value of 16.34 units.

4.3 Correlation

Pearson's correlation coefficient matrix among the variables used in the study is presented in Table 4.2 below. Pearson's correlation coefficient is the test statistic that measures the statistical relationship or association between two continuous variables giving information about the magnitude and direction of association or correlation between the variables. If the coefficient values between the variables lie between ±0.50 and ±1, then a strong correlation is said to exist. However, for Pearson's correlation to show the existence of high collinearity between the independent variables, the study sets a threshold of 0.7, following Kennedy (2008). From the table below, there is evidence of multi-collinearity among the variables used (also a reason why System GMM was employed as against the OLS). The existence of multi-collinearity is between political stability (PSTAB) and institutional quality (INSTQUA) recording a coefficient of 0.878.

Table 4.2: Matrix of correlations

Matrix of correlations

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
(1) lnITR	1.000														
(2) lnY	0.574	1.000													
(3) lnGFCF	0.340	0.256	1.000												
(4) FDI	0.008	0.109	0.346	1.000											
(5) MCS	0.426	0.517	0.213	0.213	1.000										
(6) FTS	0.392	0.748	0.208	0.215	0.432	1.000									
(7) AE	0.606	0.866	0.235	0.153	0.618	0.792	1.000								
(8) DC	0.568	0.596	0.051	-0.057	0.419	0.603	0.625	1.000							
(9) PSTAB	0.337	0.433	0.281	0.108	0.218	0.553	0.410	0.335	1.000						
(10)INTQUA	0.530	0.549	0.310	0.085	0.353	0.659	0.552	0.577	0.878	1.000					
(11) TNR	-0.340	-0.365	-0.049	0.039	-0.154	-0.428	-0.377	-0.275	-0.519	-0.569	1.000				
(12) TO	0.085	0.571	0.316	0.430	0.326	0.606	0.475	0.145	0.519	0.434	-0.168	1.000			
(13) CPI	0.086	-0.034	-0.048	0.057	0.512	-0.102	0.049	-0.029	-0.090	-0.100	0.040	-0.121	1.000		
(14) lnER	-0.334	-0.646	-0.089	-0.056	-0.231	-0.377	-0.525	-0.311	-0.204	-0.336	0.239	-0.427	0.164	1.000	
(15) lnSEP	0.294	-0.218	-0.087	-0.227	-0.014	-0.487	-0.144	0.065	-0.532	-0.364	0.370	-0.583	0.205	0.101	1.000

Economic growth(lnY) and Access to electricity(AE) also recording a coefficient of 0.866, Fixed Telephone subscriptions(FTS) and Access to electricity(AE) recording recorded a coefficient of 0.792 and finally, Economic growth (lnY) and Fixed Telephone subscriptions (FTS) recording recorded a coefficient of 0.748. Given that there exists a high correlation among some of our variables, the study conducts a Variance Inflation Factor (VIF) analysis to be able to know which variable is to be dropped from the model so as to resolve the problem of multi-collinearity. Below is the VIF report.

Table4.3: Variance Inflation Factor

Variable	VIF	1/VIF
ae	7.20	0.138922
lny	6.69	0.149468
fts	6.18	0.161739
lnsep	4.04	0.247270
lnitr	3.73	0.267765
instqua	3.47	0.288476
to	3.35	0.298912
dc	3.10	0.323042
mcs	2.95	0.339271
lner	2.06	0.485879
tnr	1.99	0.501721
cpi	1.89	0.528049
lngfcf	1.56	0.641359
fdi	1.47	0.679937
Mean VIF	3.55	

The results from the table above suggest that all variables can be used in our estimation because the VIF of all the variables as shown in table 4.3 above were below 10. This is also in line with recommendations from Kusi, Agbloyor, Ansah Adu, and Gyeke-Dako (2017).

4.4 Fisher- Type Stationarity Test

Using Fisher's test as recommended by Choi (2001), the stationarity status of all the variables was tested so we eliminate the effect of spurious regressions in our analysis. The null hypothesis of this test states that all panels contain unit-roots. It employs four main statistical approaches which are the Inverse Chi-Squared, Inverse Normal, Inverse Logit-t, and Modified Inverse Chi-squared. As recommended by Choi (2001), the study dwells more on the Inverse chi-squared test given that the panel used is finite. We expect the p-values for all the variables to be significant at 5% which is less than 0.05 so that we reject the null hypothesis. From our results below, based on the Inverse chi-squared test, we can conclusively say that all our variables are stationary. Thus, none exhibits or contains a unit root. The results are shown in Table 4.4 below.

Table 4.4: Fisher- Type Stationarity Test

Variable	Inverse Chi-squared		Inverse Normal		Inverse Logit-t		Modified Inv. Chi-squared	
	Statistic	Prob.	Statistic	Prob.	Statistic	Prob.	Statistic	Prob.
InY	213.0494	0.0000	-7.3243	0.0000	-7.8776	0.0000	10.2332	0.0000
InITR	151.2465	0.0000	-1.9569	0.0252	-2.6138	0.0048	5.4072	0.0000
LnGFCF	140.8543	0.0000	-1.8495	0.0322	-2.7116	0.0036	4.8110	0.0000
FDI	160.0400	0.0000	-2.9604	0.0015	-3.9321	0.0001	6.0939	0.0000
MCS	125.3209	0.0015	-0.1019	0.4594	-0.9175	0.1800	3.3828	0.0004
FTS	104.4817	0.0477	-1.3219	0.0931	-1.2149	0.1129	1.7555	0.0396
AE	200.7549	0.0000	-5.6510	0.0000	-6.4887	0.0000	9.2732	0.0000
DC	205.7842	0.0000	-7.7651	-0.0000	-7.8425	0.0000	13.3046	0.0000
CPI	159.2997	0.0000	-2.6260	0.0043	-3.6888	0.0001	6.5092	0.0000
LnER	160.0498	0.0000	-2.8661	0.0021	-4.5849	0.0000	6.0947	0.0000
INSTQUA	110.3361	0.0202	-1.6563	0.0488	-1.8101	0.0359	2.2127	0.0135
PSTAB	123.2391	0.0022	-2.1813	0.0146	-2.5400	0.0059	3.22022	0.0006
InSEP	107.9633	0.0009	-3.2017	0.0007	-3.5517	0.0003	3.6524	0.0001
TO	221.0982	0.0000	-8.5135	0.0000	-8.6581	0.0000	10.5774	0.0000
TNR	109.7553	0.0221	-1.77674	0.0378	-2.0885	0.0190	2.1673	0.0151

4.5 Durbin-Wu-Hausman Test for Endogeneity (Fixed versus Random Effects Test)

The Hausman test was conducted to test for the presence of endogeneity in our specified models and also to either choose between the FEM and REM in order to further confirm the appropriateness of system GMM to be used in estimating our models. According to Roodman (2006), a model that fits the use of system GMM must also work for FEM and not REM. Given that the null hypothesis of this test states that the REM is an appropriate model, a p-value of 0.0000 as shown in the results below (Table 4.5) which is less than 5% implies that we reject the null hypothesis. This suggests that the FEM is an alternative appropriate estimation procedure (although not the most appropriate in our case because of the presence of a dynamic term in our model) and hence further confirms the appropriateness in the use of system GMM as our main estimation technique especially in this case where the lag of dependent variable is included as part of the regressors.

Table 4.5: Hausman Test for Fixed and Random Effects.

Test: Ho: difference in coefficients not systematic

chi2(1) = (b-B)`[(V_b-V_B) ^ (-1)] (b-B)
= 50.26
Prob > chi2 = 0.0000

4.6 Heteroscedasticity

The table below (Table 4.6) shows the results of the White test used in assessing the presence of heteroscedasticity for our tourism (lnITR) and growth regression models respectively (lnY). The null hypothesis of this test states that there is constant variance (homoscedasticity) in the panel. The null hypothesis' were rejected at the 5% level of significance confirming the presence of heteroscedasticity. This further supports the use of the two-step system GMM as the main estimation technique for the reason that it is more robust to heteroscedasticity (Roodman, 2008).

Table 4.6: White test for heteroscedasticity

White's test for Ho: homoscedasticity

against H_1: unrestricted heteroskedasticity

chi2(65) = 109.57

Prob > chi2 = 0.0005

Cameron & Trivedi's decomposition of IM-test

White's test for Ho: homoscedasticity

against H_1: unrestricted heteroskedasticity

chi2(54) = 244.77

Prob > chi2 = 0.0000

Cameron & Trivedi's decomposition of IM-test

4.7 Results and Discussions from the Two-Step System GMM Estimation

Having reported the findings from our diagnostic tests which confirm the use of the two-step system GMM as an appropriate technique, we further present our regression results for all the estimated models.

Pre and Post- Estimation Diagnostic Tests

The Arrelano-Bond Test (1991) in first difference errors was employed to test for the presence of autocorrelation. The two-step system GMM requires that the autocorrelation at the first-order autoregressive process AR (1) should be significant (presence of autocorrelation) and that of the second-order autoregressive process should be insignificant AR (2). As such, following our results reported in tables 4.7 to 4.9, the null hypothesis of no autocorrelation of order 1 in the first difference is rejected whereas that of no autocorrelation at order 2 is not rejected at the 5% significant level for all our estimated models. This also implies that if OLS was employed in estimating our models, autocorrelation with its consequent estimation errors would have persisted in our model. Hence, the use of the System GMM.

The F-test investigates the extent to which the explanatory variables account for the variations in the explained variable. It runs on the null hypothesis that the coefficients are jointly significant. We, however, expect the null hypothesis to be rejected in order to arrive at the conclusion that at least one of the coefficients is significantly different from zero signifying that in each of the estimable equations, at least one of the independent variables present has an impact on the dependent variables (lnITR and lnY). With p-values of 0.0000 in all three models estimated, we reject the null hypothesis at the 5% significance level implying that all coefficients present in all our models are statistically different from zero.

Also with regards to the Hansen test, with a p-value greater than 0.05 as reported in our table of results below (from Table 4.7 to 4.9), we fail to reject the null-hypothesis that over-identifying restrictions are valid. Thus, the instruments used are valid for all the regressions.

Following the objectives of the study, the impact of infrastructure investment on tourism, the impact of tourism on economic growth, and the interactive impact of tourism and infrastructure investment on economic growth for SSA countries are discussed here in this section, in relation to

various theories and key findings that have been established in this literature

Table 4.7: The Impact of Infrastructure Investment on Tourism (using MCS, FTS and AE as measures of infrastructure quality)

Two-step SYSTEM GMM results

Variables	Model (1) –MCS lnITR	Model (2) – FTS lnITR	Model (3) –AE LnITR
lnITR L1.	0.394*	0.389*	0.421*
	(0.199)	(0.202)	(0.216)
LnGFCF	0.874**	0.851**	0.747*
	(0.391)	(0.356)	(0.406)
lnY	0.584**	0.405*	0.322
	(0.228)	(0.222)	(0.204)
FDI	0.007	-0.001	2.00e-06
	(0.016)	(0.017)	(0.016)
lnSEP	0.483***	0.538**	0.440*
	(0.174)	(0.218)	(0.231)
lnER	0.007	-0.002	0.007
	(0.049)	(0.053)	(0.053)
PSTAB	0.429*	0.404	0.414
	(0.224)	(0.239)	(0.248)
CPI	0.029	-0.000	-0.001
	(0.276)	(0.002)	(0.002)
MCS	0.001		
	(0.004)		
TO	-0.005	-0.004	-0.005
	(0.0041)	(0.004)	(0.004)
TNR	-0.017	-0.012	-0.009
	(0.015)	(0.018)	(0.021)
FTS		0.035**	
		(0.017)	
AE			0.011*
			(0.005)
_cons	-1.089	-0.4583	0.875

Table 4.71

	Model 1 (MCS)	Model 2 (FTS)	Model 3 (AE)
No. of observations	328	329	325
F-Statistic	60.98	73.63	47.22
Prob>F	0.0000	0.0000	0.0000
No. of Groups	35	35	35
No. of instruments	28	28	28
AR (1)	0.075	0.081	0.078
AR (2)	0.611	0.591	0.593
Hansen statistic	0.164	0.109	0.090

Notes: Standard Errors in parentheses. *, **, * represent significance at p<0.01, p<0.05, and p<0.1 respectively. lnITR= natural log of International Tourism Receipts; lnITRL1 = first lag of the natural log of International Tourism Receipts, lnGFCF= natural log of Gross Fixed Capital Formation lnY= natural log of Gross Domestic Product Per Capita, FDI = net Foreign Direct Investment inflows, scaled by GDP; lnSEP = natural log of Secondary Education enrolment; lnER = Natural log of Exchange Rate; TO = Trade Openness; PSTAB= Political Stability; CPI = Consumer Price Index; TNR = Natural Resources; MCS= Mobile Cellular Subscriptions; FTS= Fixed Telephone Subscriptions; AE= Access to Electricity (% of population); cons = Constant (intercept).**

***Notes**: It is worth mentioning that the main aim of these models is to reflect the impact of **infrastructure investment** on tourism in the case of SSA. However, the reason for employing the different measures of infrastructure quality (MCS, FTS, AE) as control variables besides telling how essential the quality of infrastructure is for tourism development, is also to be able to per the results obtained inform us on which areas of infrastructure countries in the region could invest in based on the significance of these variables to our model*

From our results in the table above, which report the impact of infrastructure investment on tourism within SSA in the presence of some other control variables, it is clear that the first lag of tourism (using international tourism receipts as proxy, lnITRL1.) is significant at 10% for all three models and positively affects current tourism growth. That is, a percentage increase in last year's tourism activities would increase current tourism activities by 0.39, 0.389 and 0.42 percent respectively. Intuitively, this implies that countries within the region recorded visits from tourists who are already familiar with the country for reasons of less uncertainty as compared to previously unvisited countries and also possibly because of knowledge about the various destinations spread by word of mouth from tourists who were impressed with the service delivery inducing more people (both old and even new tourists) to visit these countries. This is also in line with findings of (Garin-Mun, 2006) which pointed out that the provision of high-quality services has the tendency of attracting new and also repeat tourists. This is also a confirmation of earlier findings by Tang et al. (2007) who also pointed out that the representatives of MNEs in search of tangible information in addition to the general ones provided by the government and some agencies on investment opportunities embark on a series of travels. This also partly explains why previous tourism receipts influence the current.

Now, our main variable of interest Gross Fixed Capital Formation (lnGFCF) in all three models is significant at the 5% level (as seen in Model 1 and 2) and at the 10% level (Model 3), positively impacting tourism as expected. This is to say that a percentage increase in public and private investment in infrastructure (measured by the gross fixed capital formation) increases tourism growth by 0.87, 0.85 and 0.75 percent. This may result from the fact spending on infrastructure possibly leads to infrastructure development which in turn promotes tourism growth. This is in line with works of Seetanah et al. (2011), Das and Chatterjee (2017), Mandić, Mrnjavac and Kordić

(2018), Naude and Saayman (2005), and Adeola and Evans (2020) which have all found out that tourism indeed thrives on the infrastructure that supports it. Hence, any investment in infrastructure to develop it further will yield positive growth in tourism.

Economic growth (using GDP per capita, lnY, as proxy) is also positively significant. This indicates that a percentage increase in GDP per capita increases tourism growth by 0.58 and 0.41 percent as seen in Model 1 and 2 respectively. This intuitively implies that an increment in the GDP per capita within SSA countries reflects an upsurge in earnings of citizens, hence an increase in patronage of leisure among both local and foreign tourists within the sub-region. This then increases the demand for tourism and hence a corresponding increase in the supply side of the tourism sector within the SSA to meet the increase in demand for tourism. This is in line with the findings of Nene and Taivan (2017) who did not only confirm the tourism-led growth hypothesis but also found out that economic growth also drives tourism development in the case of SSA (using evidence from 10 SSA countries). The tourism-led growth hypothesis was confirmed for 60% of the SSA countries used in the study and 40% confirming the economic growth led tourism development. Also confirming this is a study by Durbarry (2002) which also established a bi-directional causality between tourism and economic growth. Thus, confirming that the tourism-led growth hypothesis does not only hold for Mauritius but economic growth as well drives tourism development.

Again, from our results, the level of education, a measure of human capital (lnSEP) significantly promotes tourism development. In essence, a percentage increase in secondary education enrolment yields a 0.48, 0,54, and 0.44 percent increase in tourism development respectively. This is to say that investment in human capital through an increase in secondary education has an impact on tourism development. Intuitively, the more people are educated, the more they acquire

knowledge and skills needed to boost the various sectors of the economy including tourism, thus, leading to the development of these sectors. This is consistent with the findings of Martins, Gan, and Fierreira-Lopes (2017) who found out that education is a key determinant of tourism development.

Political Stability (PSTAB) is a key determinant of tourism development. That is, in the absence of chaos, violence, and terrorism, we expect the patronage of tourism services within the sub-region by both locals and foreigners to increase. This is evident in our results as a unit increase in the scale of political stability leads to a 0.43 percent increase in tourism growth (as seen in Model 1). Although not significant in Model 2 and 3, its impact on tourism remains undeniably positive in both models. The results also confirm the findings of Naudé and Saayman (2005) who found out that political stability is a key determinant of tourism demand in Africa.

Finally, measuring infrastructural quality using the number of mobile cellular subscriptions per every 100 people (MCS), the number of fixed telephone subscriptions per every 100 people (FTS), and (AE) access to electricity (% of the population) in table 4.7, it is seen that our mobile subscription variable is not significant but our telephone subscription variable and access to electricity are both significant at the 5% and 10% significance level respectively. That is, a unit increase in infrastructural quality (specifically, FTS and AE) although quite small in magnitude increases tourism by 0.04 and 0.01 percent respectively. It is also worth mentioning that although our mobile subscription variable is not statistically significant, its impact on tourism remains positive. This means that the quality of infrastructure is key in promoting tourism. The result also implies that a major area of attraction for inbound visitors in terms of infrastructure quality includes the number of telephone subscriptions in the region and access to electricity. This is no way far from what is expected. In the sense that, considering the fact that these foreigners are likely

to lodge in hotels for their short stay and coupled with the fact that most of these facilities make good use of telephones, the number of telephone subscriptions is expected to be a major concern for them as compared to the mobile subscriptions. It is same with access to electricity. If access to electricity is bad, and the supply of power is unstable, tourism activities can be adversely affected. This makes electricity also a major area of concern for these visitors hence their significant and positive impact on tourism.

Table 4.8: The Impact of Tourism on Economic Growth

Two-step SYSTEM GMM results

Lny	Coef.	Std.Err	T	P>|t|	[95% Conf. Interval]	
lny L1.	0.9585***	0.0244	39.24	0.000	0.9089	1.0081
LnITR	0.0110*	0.0064	1.71	0.096	-0.0020	0.0241
FDI	-0.0008	0.0007	-1.09	0.284	-0.0024	0.0007
LnSEP	-0.0062	0.0055	-1.13	0.267	-0.0172	0.0049
LnER	-0.0067*	0.0034	-1.95	0.059	-0.0136	0.0003
DC	0.0002	0.0003	0.71	0.485	-0.0004	0.0008
lnGFCF	0.0158	0.0121	1.31	0.197	-0.0086	0.0403
TO	0.0003	0.0003	1.12	0.271	-0.0003	0.0009
TNR	0.0012***	0.0004	2.80	0.008	0.0003	0.0020
INSTQUA	0.0069	0.0154	0.45	0.654	-0.0244	0.0384
_cons	0.1363	0.0887	1.54	0.133	-0.0436	0.3161

Number of instruments = 12
Number of obs = 356
Number of groups = 37

F statistic = 10074.11
Prob > F = 0.0000

AR(1): P-value = 0.022
AR(2): P-value = 0.779
Hansen test: P-value = 0.343

Notes: *, **, * represent significance at p<0.01, p<0.05, and p<0.1 respectively. lny= natural log of Gross Domestic Product Per Capita, lny L1 = first lag of the natural log of Gross Domestic Product Per Capita, lnitr= natural log of international tourism receipts; lngfcf= natural log of gross fixed capital formation; fdi = net foreign direct investment inflows, scaled by GDP; lnsep = natural log of secondary education enrolment; lner = Natural log of Exchange Rate; dc= domestic credit to private sector to private sector; to= Trade Openness; tnr = Natural Resources; instqua= institutional quality; cons = Constant (intercept).**

Table 4.9: The Impact of Tourism on economic growth through infrastructure investment

Two-step SYSTEM GMM results

LnY	Coef.	Std.Err	T	P>|t|	[95% Conf. Interval]	
lnY L1.	0.9319***	0.0285	32.73	0.000	0.8742	0.9896
lnITR	0.0158**	0.0078	2.04	0.049	0.0001	0.0315
lnGFCF	-0.0608*	0.0345	-1.76	0.087	-0.1309	0.0092
lnGFCFlnITR	0.0043**	0.0020	2.11	0.042	0.0002	0.0084
Total Effect of ITR ($\beta_3+\beta_4(\ln GCFC_{it})$	0.028**	0.0101	2.79	0.005	0.0084	0.0482
FDI	-0.0008	0.0007	-1.08	0.289	-0.0024	0.0007
LnSEP	-0.0171**	0.0069	-2.49	0.018	-0.0311	-0.0032
lnER	-0.0082*	0.0042	-1.92	0.062	-0.0168	0.0004
DC	0.0004	0.0004	1.01	0.320	-0.0004	0.0012
INSTQUA	0.0012	0.0171	0.07	0.947	-0.0335	0.0358
TO	0.0004***	0.0003	1.44	0.159	-0.0002	0.0010
TNR	0.0016	0.0005	3.41	0.002	-0.0007	0.0026
_cons	0.4466	0.1881	2.37	0.023	0.0652	0.8279

Number of instruments = 13
Number of obs = 345
Number of groups = 37

F statistic = 2967.02
Prob > F = 0.0000

AR(1): P-value = 0.025
AR(2): P-value = 0.671
Hansen test: P-value = 0.449

Notes: *, **, * represent significance at p<0.01, p<0.05, and p<0.1 respectively. lny= natural log of Gross Domestic Product Per Capita, lny L1 = first lag of the natural log of Gross Domestic Product Per Capita, lnitr= natural log of international tourism receipts; lngfcf= natural log of gross fixed capital formation; lngfcflnitr = interaction between investment in infrastructure and tourism; fdi = net foreign direct investment inflows, scaled by GDP; lnsep = natural log of secondary education enrolment; lner = Exchange Rate; dc= domestic credit to private sector to private sector; to= Trade Openness; tnr = Natural Resources; instqua= institutional quality; cons = Constant (intercept).**

The regression results reported in tables 4.8 and 4.9 above tackles our second and third objectives which are the impact of tourism on economic growth and the impact of tourism on economic growth through infrastructure investment respectively. It is evident that in both tables, the first lag of the natural log of GDP per capita (lnY L1.) has a positive impact on the current natural log of GDP per capita (lnY) at the 1% significance level. That is, a percentage increase in the previous year's GDP per capita leads to a 0.96 and 0.93 percent increase in current GDP per capita respectively. Thus, previous years' economic growth affects the current positively for the countries within the region although most of these countries are still within the developing stage. This is in line with the findings of Fauzel et al. (2017) who analyzed the impact of tourism FDI on economic growth from a small island developing state.

The results of the study shown in Table 4.8 in line with our second objective, confirms the tourism-led growth hypothesis. In table 4.8, international tourism receipts (lnITR) which is our main variable of interest as a measure of tourism growth or development is significant at 10% and positively impact economic growth. That is, a percentage increase in tourism development leads to a 0.011 percent increase in economic growth. This finding is in line with the expectation of the study taking into account the kind of growth benefits countries in the region derives from the tourism sector as discussed in the first chapter of this study. As compared to the findings of some earlier researchers, the magnitude of the impact tourism has on economic growth is relatively minimal. For instance, Dristsakis (2004) who looked at the impact of tourism on economic growth in the case of Greece found that a percentage increase in tourism development leads to a 0.313% increase in economic growth. However, in line with our study, some studies such as Sequeira and Nunes (2008), Tang and Tan (2015), and Fayissa et al. (2008) also confirming the tourism-led growth hypothesis recorded quite a lower magnitude of 0.04 percent in the case of some selected

developing countries, 0.09 percent in the case of Malaysia and 0.025 for some African countries respectively. These and some other empirical findings have shown that although tourism as a sector significantly and positively contributes to economic growth, the magnitude of contribution has consistently been recorded as minimal. However, this minimal impact tends to support contemporary economic growth assertions that, first of all, sectors that are highly linked to technological advancements such as insurance, manufacturing, banking sectors, and secondly, sectors that are given relatively more attention such as agriculture, tend to impact more on economic growth than those that have little influence from technology and are still not receiving much attention like tourism considering the fact that there are still unfulfilled tourism potentials. Nonetheless, the minimal contributions of tourism to economic growth partially stems from the main challenges highlighted as restricting the tourism industry from achieving its full growth potentials. These challenges apparently include the inadequate investments and infrastructural base currently facing the tourism sector within SSA.

The exchange rate (lnER) is significant at 10% and contributes negatively to economic growth as shown in both tables 4.8 and 4.9. That is, an increase in the exchange rate leads to a decrease in economic growth for the SSA region. This implies that a depreciation in the currencies of SSA countries as against that of foreign currencies decreases the economic growth of the region. More so, a depreciation in local currencies can result in exports being cheaper and imports prices possibly increasing. Import becoming more expensive can cause inflation and adversely affect economic growth. Our findings contradict that of Dritsakis (2004) who found out that the exchange rate positively affects economic growth and that economic growth rather impacts the exchange rate negatively.

At a 1% significance level, natural resources impact economic growth positively as seen in both tables 4.8 and 4.9. For a region like SSA which is endowed with natural resources, we expect the tapping of these numerous resources by local and foreign investors to bring earnings in the form of rents for land, forest, and water usage. We also expect the harnessing of these resources to create beautiful tourist centers to also positively impact economic growth. This is in line with the findings of Dunning (2000) and Sunde (2017) who pointed out that natural resources are essential for positive economic growth as well as other factors such as trade openness and institutional quality (just as seen in our case too although not significant).

In table 4.9, we find out that the impact of human capital (lnSEP) on economic growth for the sub-region measured by the level of secondary school education is significant at 5% but negatively impacts economic growth. That is, a percentage increase in secondary school enrollment decreases economic growth by 0.02%. This implies that, despite the fact that most of the countries in the region are somewhat densely populated, the quality of labor force in terms of knowledge and the requisite skills is still low affecting the level of productivity and hence economic growth in the long run. Although contrary to our expectation, this finding is in line with findings of Mankiew et al. (1992) who observed a negative relationship between human capital and economic growth owing to the fact that when human capital is low, it translates into low productivity, hence, low economic growth.

Finally, in table 4.9, we interact infrastructure investment (lnGFCF) with tourism (lnITR) to be able to ascertain the level of impact of tourism on economic growth given investment in infrastructure. From the results, the coefficient of the interaction term indicates a positive impact on economic growth. The net effect on economic growth of the interaction between tourism and

infrastructure investment is (0.0158 + (0.0043 (2.94)) = 0.028442. In this computation, the effect of tourism on economic growth is 0.0158 given that investment in infrastructure is "0". 0.0043 is the conditional effect from the interaction between tourism and investment in infrastructure, whereas 2.94 is the mean of our investment variable (lnGFCF) see (Kriese et al.,2019; Asongu et al., 2017; Tchamyou, 2018). We can, therefore, establish that the interaction of tourism with infrastructure investment has a positive impact on economic growth. The net effect confirms that investment in infrastructure enhances tourism's contribution to economic growth.

This result is in line with conventional wisdom, as we expect any investment in infrastructure to improve the infrastructural base. With an improved infrastructural base, countries within the region become attractive tourist destinations thereby enhancing the growth of the tourism sectors and in turn promoting economic growth. The results confirm the arguments of Kumar et al. (2014) and Kim et al. (2006) on the tourism-led growth hypothesis that, if the TLG hypothesis is valid, then government resources should be allocated to developing infrastructure, which is the beginning of the cycle of the tourism-led growth hypothesis. Furthermore, the theory of "unbalanced" growth which argues that it is more "desirable" for an economy to strategically channel its resources to selected investment avenues, holding to the belief that, no LDC has enough resources to invest in multiple sectors at the same time without falling apart is confirmed by our results. In that, our results suggest that should government resources be strategically invested into infrastructure, all things being equal, the impact on economic growth is undeniable as we expect an enhancement in industrialization and other sectors that are drivers of economic growth such as tourism to benefit.

4.8 Summary of Chapter

In this chapter, a summary of the results from all pre-estimation and post-estimation diagnostic tests conducted were presented. The test outcomes clearly support the use of the two-step system GMM as the main estimation technique. Finally, the results of the objectives of the study were also presented and discussed in line with the works of earlier researchers and supporting theories.

CHAPTER FIVE

SUMMARY, CONCLUSION, AND RECOMMENDATIONS

5.1 Introduction

This chapter concludes our study by presenting the key findings of the study with recommendations for policy, academic, and future research. Also identified and listed here are some limitations of the study and suggestions for further studies.

5.2 Summary of Findings

The results of this study confirm that investment in infrastructure is very essential to tourism development in SSA. It was also found out that previous years' tourism activities positively influence current tourism activities. Also essential to tourism development are key factors such as quality human capital, political stability, and infrastructural quality.

The study further confirms the tourism-led growth hypothesis for SSA highlighting that tourism is indeed a viable sector for growth. The study also confirms that economic growth in itself also drives tourism development. Hence, a bidirectional causality between tourism and economic growth with the direction of movement being positive for both.

It was also found out that another plausible way to look at the tourism-led growth hypothesis for SSA is to consider investing in infrastructure as an enhancing factor given that the tourism sector for the region is constrained by poor infrastructure. Finally, human capital was found to have a negative impact on economic growth indicating that the quality of human capital for the region based on this study is still low. The exchange rate as expected was also found to have a negative impact on economic growth. However, it was found out that the ample natural resources of the region are very essential for economic growth.

5.3 Conclusion

In line with the objectives and questions this study seeks to answer and also following the results obtained, we can first of all conclusively say that investment in infrastructure positively affects tourism hence, the need for general investment in infrastructure. It can be inferred that general investment in infrastructure can possibly improve the quality of infrastructure and translate into growth in tourism activities given that tourism thrives on the infrastructure that supports it.

Also, as far as economic growth is concerned for SSA, our results confirm that tourism is also a viable sector that needs more attention and nurturing for higher growth as such, the need for countries within the region to put the right measures in place to maintain high-quality services in other to repeat old tourists and attract new ones. There is also the need for countries within SSA to pay much attention to the unrealized growth potentials the sector holds like safari tourism, adventure tourism among others, in order to achieve higher growth.

Then again, the importance of investment in infrastructure cannot be downplayed in looking at the tourism-led growth hypothesis. The results confirm that tourism's impact on economic growth is conditional on the level of investment in infrastructure hence the Governments of these countries should pursue both routes as complementary.

Furthermore, the Governments of the countries within SSA are encouraged as part of the ways to deal with the challenges restricting the tourism sector of the region, to invest more in infrastructure to enhance tourism's contribution to their GDP. More specifically, and in line with our results, to promote tourism, Governments of these regions should invest to increase the number of telephone subscriptions and improve access to electricity as these are some key aspects of infrastructure quality that the tourists look out for.

5.4 Recommendations

According to the literature on tourism and economic growth, tourism development has enhanced growth for many economies both developing and developed ones. Based on this study which focuses on SSA, the following policy recommendations are worth mentioning for the region;

To begin with, based on the findings of this study, policies that lead to tourism development such as investment in infrastructure and provision of amenities such as access to electricity, telephone subscriptions, airport, roads, harbor, access to clean water among others must be fostered by SSA economies.

Owing to the fact that the tourism sector is seen to be a viable sector from our study, there is a need for SSA economies not to neglect equally important sectors of the economy in their quest to achieve holistic growth. As such, there should be a universal development across all sectors of the economies, and policies like increased budgetary allocations into seemingly neglected sectors like tourism should be encouraged. Also, policies that would encourage private investments in infrastructure should be implemented as different sectors of the economy that drive growth can benefit from such investments. This would also help supplement resources that have been channeled by the government for the purpose of infrastructure development. Having said this, the governments of these economies should create the right environment to induce private and even foreign investors to take up such initiatives.

Again, there is obviously a need for stable and favorable movements in macroeconomic variables such as the exchange rate and even the rate of inflation as these variables influence investors' trust in the economies of SSA. As such, the central bank and other regulatory bodies should continually develop pragmatic ways to keep these indicators stable. To attain this, the need for governments of these economies to strengthen the independence of their central banks cannot be overlooked.

A key determinant of tourist destinations is political stability. Most tourists consider this before paying visits to their destinations. As such, the absence of chaos within countries in the region must be encouraged. A number of countries within the region like Ghana, Benin, Cameroon, Angola, Seychelles among others are seen to have recorded somewhat peaceful environments. However, it is still imperative for all the nations to realize that political stability is needed for economic growth hence, the need to implement and enforce policies to maintain a peaceful environment.

Last but not least, the quality of education really matters given its significant contribution to tourism growth. To further ensure its impact on economic growth is positive and significant, policies that are geared towards ensuring that citizens attain quality education - at least to the secondary level - ought to be encouraged among SSA countries. Like Ghana has started the "Free Senior High School Education" policy, other countries in the region can take a cue from that and implement similar policies that are relevant to their economies and can guarantee an improved level of human capital.

5.5 Contributions of the Study

The uniqueness of this study emanates from the fact that it happens to be the first that went further to look at the tourism-led growth hypothesis by taking into consideration investment in infrastructure in the case of SSA. Thus, it is the first to explore the relationship among the three using the two-step system GMM. The main contributions of this study to literature include the confirmation of the tourism-led growth hypothesis for SSA and further bringing to the fore that one plausible way to look at this hypothesis is by taking into account the essence of SSA economies investing more in their infrastructure. The study also reveals at least two areas of infrastructure that the countries in the region can invest in to develop and maintain its quality in order to promote

tourism. They include investing to increase and or improve the number of telephone subscriptions and access to electricity.

5.6 Limitations and Suggestions for Future Study

The focus of the study was mainly on how investment in infrastructure affects tourism as a sector and how that translates into economic growth, thereby neglecting other sectors that equally benefit from infrastructure and are also being constrained by the problem of inadequate infrastructure. Therefore, further studies could set out to investigate whether the contribution of other sectors (such as manufacturing and agriculture) to economic growth could also be enhanced through infrastructure investment.

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