Tourist Arrivals, Supply and Demand Gap Analysis for Hotel Sector in Addis Ababa

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Addis Ababa, Ethiopia

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List of Contents

Certificate of Originality

This is to certify that the project titled "**Tourist arrival, supply and demand gap analysis for hotel sector in Addis Ababa**" is an original work of the student and being submitted in partial fulfillment for the award of the Master's Degree in Business Administration of Indira Gandhi National Open University. This report has not been submitted earlier to this University or to any other University/ Institution for the fulfillment of the requirement of a course of study.

SIGNATURE OF SUPERSISOR

Place :_____

Date:_____

SIGNATURE OF STUDENT

Place_____

Date:_____

Acknowledgement

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Dedication

I dedicate this thesis to my wonderful loving child Nebiyu Samuel. His simplistic nature and upbeat attitude to life has given me a chance to see life in a new light which gives me the courage to move ahead.

Abstract

Background

Ethiopia has abundant heritage tourism resources, for which it has been ranked highly globally at position 38, at par with Egypt which is well known globally for its predominantly heritage-based tourism resources, including the pyramids. Despite the high ranking of both destinations in 2008, for instance, there were 12.2 million international tourist arrivals to Egypt compared to 330 000 to Ethiopia (UNWTO, 2012).

Problem Statement: The main problem which has been tried to be addressed is forecasting of future tourist arrival for Ethiopia vis-a-vis Addis Ababa. The objective is to deliver research out put on Tourist Arrivals, Supply and Demand Gap Analysis for Hotel Sector in Addis Ababa. The research output is expected to answer various issues (questions) which are related to the main topic. **Expected Contribution of the Study;** To provide & deliver research output which could be reasonable source of information for tourism as well as the hospitality sector strategic planners, policymakers, consultants, investors, financing officers, and market analysts of tourism products. **Methodology**; a theoretical assessment of the requirement of forecasting process and forecasting method selection has been studied and researched to select appropriate forecasting method for the long term tourist arrival for Ethiopia. Accordingly Box-Jenkins approach is selected to be used for forecasting the monthly tourist arrival for the country. X-12-ARIMA seasonal adjustment program, which has been developed by United State senses bureau, has been used as application software to forecast the long term tourist arrival for the country. **RESULT**: The result shows among the list of models, model (011) $(011)_{12}$ is the most appropriate model to forecast the monthly tourist arrival. Where us Model (210) $(011)_4$ is the most appropriate model for forecasting the quarterly arrival for the country.

Furthermore the method has forecasted that the annual tourist arrival for the country in a year 2015, 2020, and 2025 is expected to be 798,157:1,130,971:1,463,743 respectively. Use of funneling technique, combined with stepped function intervention model is used to establish different case scenario (positive, negative, starched intervention) which have been investigated to foresee the relation between the demand & supply of accommodation sector under different circumstance. **Conclusion**; the result of the study shows, a lot need to been done to increase the number of arrival to country. In overall, the country needs to step up its effort to attract more visitors. With regard to the accommodation sector supply & demand relationship the result shows unless a game changer intervention is done to change the situation, the supply of rooms out strips demand for the next five to ten years. This creates a challenging business environment for accommodation sector in the city of Addis Ababa, especially for newly opened hotels which needs higher occupancy level to sustain & establish reasonable level of operational activity.

LIST OF DIAGRAMS **PAGE NO**

LIST OF TABLES **PAGE NO**

ACRONYMS

AACTB: Addis Ababa culture & tourism Bureau

AAIA: Addis Ababa investment agency

AAPE: Average absolute percentage error

ACF: Autocorrelation Function

AECOM: consulting group with global presence, www.aecom.com

AHA: Addis Ababa Hotel owners trade association

AIC: Akaike information criteria

ARIMA: Auto regression Integrated moving average

ARMA: Auto regression moving average

BDES: brown`s exponential smoothing

BPQ: Box pierce Q statistic

DES: double exponential smoothing

FDRE: Federal democratic republic of Ethiopia

GDP: Gross domestic product

GNP: Gross national product

GTP: Growth and transformation plan

IGAD: Inter-Governmental Authority on development

LBQ: Ljung Box Q statistic

MOCT: Ministry of culture & tourism

MTA: Monthly tourist arrival

PACF: Partial auto correlation function

QTA: Quarterly tourist Arrival

SARIMA: Seasonal auto regression integrated moving average

SES: Single Exponential smoothing

SMA: Single moving average

SSA: Sub-Saharan Africa

UNWTO & ETC: United nation world tourism organization & European Travel commission

UNWTO: United nation world tourism organization

TABLE OF CONTENT **PAGE NO**

CHAPTER ONE

1.1. Back Ground (Tourism)

Tourism is an economic activity of primary value and importance for many countries. It is increasingly recognized as a valued mechanism for job creation, economic development and poverty reduction. As a result & it is being promoted as an important source of economic growth especially in developing countries. Over the past six decades, tourism experienced continued expansion and diversification, becoming one of the largest and fastest-growing economic sectors in the world (UNWTO; 2013). Today, tourism is the world's largest service industry. UNWTO publication, tourism towards 2030 shows that tourism offers a great potential for further expansion in coming decades; emerging as well as established destinations can benefit from this trend and opportunity, provided they have shape adequate conditions and policies with regard to business environment, infrastructure, facilitation, marketing and human resources.

1.2. Motivation for Selection of Research Topic

Sometime In mid-Decemberof2012, a group of people are invited to attend presentation from a team of expat expert presenting their view of the business case study for a major hotels project in Addis Ababa. Among other things the expert view on the challenge of upper class Hotel in Addis Ababa has caught the attention of few of the participant. The expert believes that due to addition of new hotel to the market. The competition for class of hotel operating in Addis Ababa is becoming more and more challenging & it will be increasingly competitive .As the result there exist the possibility that existing operating hotel will face the prospect of losing some of their market share. The experts were convinced that there will be an eighty percent

increase of hotel rooms within two to three years period.[1]Under such circumstance, they believe that it will be a bit challenging to conduct business as usual. In addition they have also raised the problem of data availability as well. However, based on what they have, they were having opinion which fever there is already over supply of rooms in the city & there is strong possibility that the oversupply will continue to foreseeable period. Their Conclusion has surprised some of the participant of the presentation because the general consent (understanding) was there is rooms shortage not over supply.

This has become the starting point to inquire more about the situation. What have been observed since then is, number hotels are opened though most of them are smaller size category. Nevertheless, it has boosted the availability of room Supply in the city. At the same time many hotel projects are under progress.

On the other hand most of the local professional which has Involvement in the industry believe that there is still a supply gap. In one business case study done by local consultant (Multilink project development solutions) for Long stay hotel Set up which is now expected to be run by International Hotel chain in Addis Ababa concludes that the unsatisfied room (beds) demand in 2013 will be 728387 & the gap will increase to 1,930,175 by 2020 (Multilink Feasibility Report;~2010).

A research paper by Gobena & Gudeta (2013) discussed the hotel sector investment in Ethiopia & concludes that "The Hotels industry of Ethiopia signifies a substantial gap between demand for hotels and supply of accommodation establishments. The paper further Recommended`` increasing the supply of a good quality hotel accommodation throughout the country is

[1]For the reason of confidentiality the specifics are not disclosed here.

necessary for the subsequent improvement of the competitiveness of the sector". Although the conclusion is for the country, the authors believe "In Addis Ababa, hotel demand conditions are buoyant particularly at the top end of market. This reflects the lack of supply of high quality hotels and the relative lack of seasonality of conference and business travel". Considering the fact that Addis Ababa is the hub of the country in every aspect of inbound & outbound travel, as well as being the main venue for conference &meeting. It is reasonable to assume that major portion of accommodation demand requirement resides in the city.

Secondly, a significant number of people including business people believe that there is a chance to make money in the hospitality sector. This can be seen from the number of new hotel projects going on as well as from the rate of opening of new hotels in Addis Ababa. Gobena & Gudeta, cited the Addis Ababa Investment Agency (AAIA) indicating that a total of thirty seven, Investors have taken investment permit in Addis Ababa alone to construct hotels with star ratings in 2012/13.

In overall there is difference of opinion on the supply & demand gap for hotel rooms in Addis Ababa. While one side strongly believes there is Strong gap in (Supply & demand) the other group is not that optimistic about it. The second group opinion believes there is already an Oversupply of rooms in the city, suggest to be cautious & monitor the environment from time to time.

Considering the rate of addition of hotels (rooms) to the market & the relative slow growth of arrival data, Under performance of sector from GTP plan, (Half a million tourist Visit the country every year, while the Ethiopian government GTP plan for sector shows One million tourist Visitor per year by 2015), coupled with the size of resource requirement, i.e. huge up front

capital requirement of the industry relative to other sectors. Prompts, to look for facts a bit deeper than a hunch or beyond personal Opinions. Therefore, this provides sufficient reason to come to conclusion that the case is worth to be investigated. Which, requires working on forecasting of tourism demand.

1.3. Current Trends in Addis Ababa

The current trend in Addis Ababa shows the city is witnessing a construction boom. A lot of construction activity is going on. While the public sector is heavily engaged in the public goods by building Roads, Transportation system (Light railway), large settlement of condominiums set ups, telecommunication infrastructure .The private sector is also engaged in different Business related construction activity (small & medium scale enterprises) facilities such as office buildings, private hospitals, mixed use building, Super markets, hotels are among the major areas which has shown the biggest share of activity. With regard to the private sector activity, most of the construction activities are intended in real estate, mixed use building, office space, like bank &insurance, as well as intended for different business set ups.

Although it is difficult to exactly categorize & identify the intended design purpose of these different building from what has been observed for last couple of years most of the buildings are approved for mixed use, lower level floors are used for shops, banks super markets while upper levels are used for office space rentals as the same time a number of them are seen opened as hotels.

These hotels are coming to the market at the rate which has never seen in Addis Ababa before. There could be different factors for this phenomena but it is assumed that pursuing investors are encouraged to invest in the industry by couple of reasons. The sector is among identified

sector of the economy which receives support from the government in the form of incentive scheme. The scheme provides import duty Exemption for input goods such as furniture, fixtures& Equipment (FF & E) ,the willingness of bank to extend loans, although there is strong risk aversion tendency from them & request of significant collateral (request or demonstration of commitment by covering at list 50 % cost of construction being covered before considering lending), shear gut feeling (business acumen), relative ease of Input availability or could be due to the investment is considered efficient for the purpose of creating diversified portfolios & it is considered as a good hedge against inflation .

Hotels in general require the huge capital. Perhaps the most unique attribute of hotel investment relates to the large up-front cost of construction. The hotel investment is characterized by a large share of fixed to total cost. It is characterized by a 'high operating leverage'. The cost composition of hotels includes a large component of fixed costs and a small share of variable (operating) costs (Freeman & Felsenstein; 2007). The fixed cost I.e. the cost estimate per room for mid-scale hotel In Africa is in range of hundred and eight thousand (Nairobi) to hundred eighty seven thousand (Nigeria) USD per room (AECOM). In general higher building cost in the range of up to four hundred thousand have been observed Nigeria & two hundred fifty thousand in Ghana. In contrast a full service hotel cost is two hundred thousand anywhere else in the world (Christie and Crompton; 2001) This will imply that a hundred room hotel at the minimum will require in range twelve to fifteen million USD. The point here is that, the above figures could high light the order of magnitude estimate for resource requirement. While this shows the rough estimate of the requirement what is happening in recent years in Addis Ababa shows the private sector willingness to commit such some of resource in the

hospitality sector. What makes it interesting is that it does not seem that the lack of information to come to decision in the sector did not hinder the increasing tendency of the private sector to involve more. In this context most of the decisions are made mainly based on an assumption that there is plenty of room for everybody to be part of the activity. This is not off course based on objective data or information. So far most of the decision is done without assessment of future demand forecast. If there were an attempt to base decision on such data most of it hangs on assumptions rather than objective data. Preliminary, consultation with different professionals Indicates that there is a gap to find material which address the issue either for the current, intermediate or long range time frame (period).

1.4. Trend of Hotel Sector in Addis Ababa

The current condition in Addis Ababa indicates that a number of hotel project are going on in & around the city. Considering the severe shortage of standard accommodation facilities in previous years, the current situation shows much improved change from the supply side. The hotels are built & joining the market at the rate which has never seen before. Most of the hotels opened are Small hotels in the range of 40 to 60 room category. However a number of hotel that falls in the range of 60-120 rooms are also being opened. It is understandable that the situation has increased the supply of rooms in city. Considering the long stagnated room supply condition a decade earlier the rate in which rooms are coming to market has already changed the land escape for those operating in the sector & as the result the sector has become more and more competitive.

However, a number of questions with regard to the hospitality sector are not fully answered yet. Question like, is the current market situation inviting to attract new players in the sector? What is the middle & long term expected market outlook for the industry? Is it possible to get returns on investment within acceptable time frame of business practice?

If we look at the current situation, although international hotel operators recommend to have higher count of rooms per hotel in order to have profitable operation. In case of Addis Ababa most of the hotels in Addis Ababa which have thirty to sixty room capacities are able to maintain their operation thus far. In order to estimate the number of rooms in Addis Ababa, if we consider the average room count as fifty per hotel. Considering the number hotel currently operating is in the range of 120-130, (Addis Ababa Hotel Owners Association, AHA).A simple arithmetic will give, the number of room currently in operation could be in the range of 6000-7500 rooms. If it is consider the average Number of rooms as 7000 & Average occupancy for industry in the range of 50 % (this is considered as lower level of occupancy & fairly challenging business environment in hotel industry) the supply could be considered in range of three thousand five hundred rooms / day. This translates in to one million two hundred seventy seven thousand & five hundred rooms /annum. This is just a hypothetical minimum figure in which the Hotels could operate without having a major challenge to service their loan. Otherwise the actual available room could be much higher than this. On the other hand, if we see the demand side from point of view of arrival to the country, it is estimated that close to five hundred thousand visitors / annum. Under such circumstances, one needs to probe on the merit of the decision or the Unknown factors which justifies the continuous allocation of the resource.

1.5. Problem Statement

The main problem to be considered here revolves around the lack of information regarding projection of future tourist (visitor) arrival. In the current condition, it is difficult to have an idea or the estimate of arrival for this year or for the year after, neither there is an idea about the expected arrival for next five years. What we have thus far is total arrival of past years. However, such information at best is historical information. Data like this can only provide us very limited information which shows modest increment in number of arrival from time to time. It did not tell us what will be the expected volume of arrival for future period. The information can only show the trend of the situation. It did not provide the necessary detail level of information for decision on investment in destination infrastructures which requires long-term financial commitments; which potentially could have sunken cost. It is also less than sufficient for policymaking.

Conflicting argument & recommendation exist regarding accommodation supply & demand Gaps. For example one business case study for a major international hotel chain in Addis Ababa indicate that there is already excess supply of rooms in Addis Ababa[2]where as other reports indicate contrary to it. The second opinion argues there is shortage of hotel rooms. (Tourism development policy MOCT; 2009) Gobena & Gudeta (2013), report of Multi link consult for Long stay hotel set up in Addis Ababa.

There is also ample evidence in the city that investors are looking for hotel development sites. These indicate that they believe the market has a business opportunity. Significant amount of

[2]Business case study for major hotel chain in Addis Ababa, for confidentiality reason the specifics are not disclosed here.

scarce resources are invested, based on the assumption or personal opinion with less than satisfactory probing of the market situation.

1.6. Research Objective

The main research objective is to deliver research out put on Tourist Arrivals, Supply and Demand Gap Analysis for Hotel Sector in Addis Ababa. The research output is expected to answer various issues (questions) which are related to the main topic. The output is also expected to be good source of information for tourism & hospitality sector strategic planners, policy makers, consultant, investors, financing officers and market analyst of tourism product.

The objective is expected to address the following.

- To study & forecast visitors arrival (Tourist Arrival; TA) to the city of Addis Ababa.
- Since Addis Ababa is main hub of the inbound & out bound travel the forecast could also hold for the country. Therefore the forecast can provide or fill the vital information gap for tourism especially for the hospitality sector in the country by providing Tourist Arrival (TA), for longer period.
- Tourism investment, especially investment in destination infrastructures requires long-term financial commitments .The prediction of long-term demand for tourism will be critical input for part of the investment project appraisals for tourism related infrastructure such hotels, roads ,air ports.
- Accurate forecasts of demand in the tourism sector of the economy will help policy makers in formulating and implementing appropriate medium to long term policy and strategy.

- Based on the long range forecast analysis, find out the trend of demand for hotel rooms in Addis Ababa.
- Based on the demand analysis to find out the gap between the supply & demand for hotel rooms in Addis Ababa.

1.7. Expected Contribution of the Study

To provide & deliver research output which could be reasonable source of information for tourism & hospitality sector strategic planners, policymakers, consultants, investors, financing officers, and market analysts of tourism products.

CHAPTER TWO

Literature Review

2.1. An over view of international tourism

The United Nation World Tourism Organization (UNWTO) on its updated of the long-term outlook, tourism towards 2030 has indicated the future tourism trends. Growth is reported at moderate pace compared to previous estimate & it will slow down from 4.2% per year (1980–2020 to 3.3% (2010–2030).The slowdown is due the result of four factors: the base volumes are higher, so smaller % increases still add substantial numbers. Lower GDP growth, as economies mature, a lower elasticity of travel to GDP, a shift from falling transport costs to increasing ones. The growth represents some 43 million more international tourist arrivals every year, reaching a total of 1.8 billion arrivals by 2030. At the same time, World Tourism Organization UNWTO has also announced that the Total export earnings generated by international tourism in 2013 was US$ 1.4 trillion. Receipts earned by destinations from International visitors grew by 5% to reach US$ 1159 billon. While an additional US$ 218 billion was earned by international passenger transport. International tourism (travel and transport) account for 29% of the world's export of service and 6% of the overall export of goods and service. As worldwide export category, tourism ranks fifth after fuel, chemicals, food and automobile products, while ranking first in many developing counties.

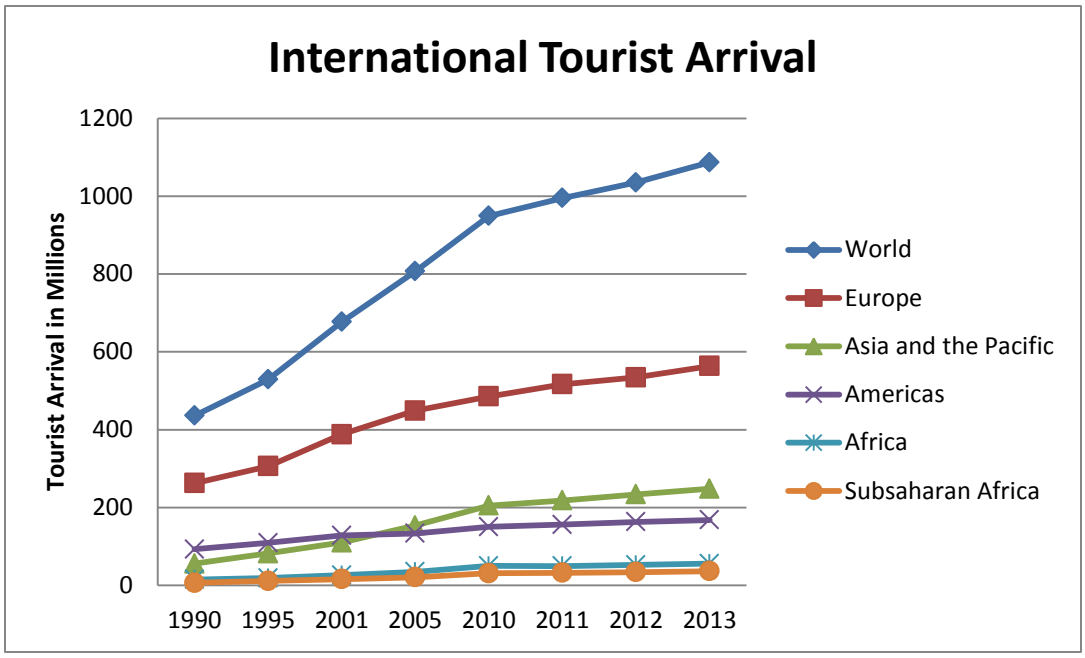


Fig 2-1: International Tourist Arrival. Source: UNWTO, 2014

Europe is the main tourist generating block relative to population. Asia pacific, America, Middle East and Africa follow suit. On the other hand Europe still has the highest in bound market share. However, the market share for Europe and America shows declining trend while other region like Asia and pacific grow faster (UNWTO 2012). With regard to long term forecast, UNWTO tourism highlight 2014, has reconfirmed the earlier long term forecast on tourism towards 2030 by upholding international tourist arrival is forecast to increase by 3.3% a year. It also indicates between 2010 to 2030 arrival in emerging destination is expected to increase by 4.4% a year which an increase of twice the rate of those advanced economies (+2.2% a year). The market share of emerging economies increase from 30% in 1980 to 47% in 2013 and expected to reach 57% by 2030, equivalent to over 1 billion international tourist arrival (UNWTO: 2014). UNWTO revised the growth of international tourist for 2014 to 4-4.5% from the 3.3% indicated for tourism towards 2030. Later on confirm that the international tourist

arrival for 2014 reached 1,138 million. This is 51 million more than 2013 a 4.7% increase. It also indicates 2015 forecast of international tourism is expected to grow by 3% to 4%. (UNWTO; January 2015).

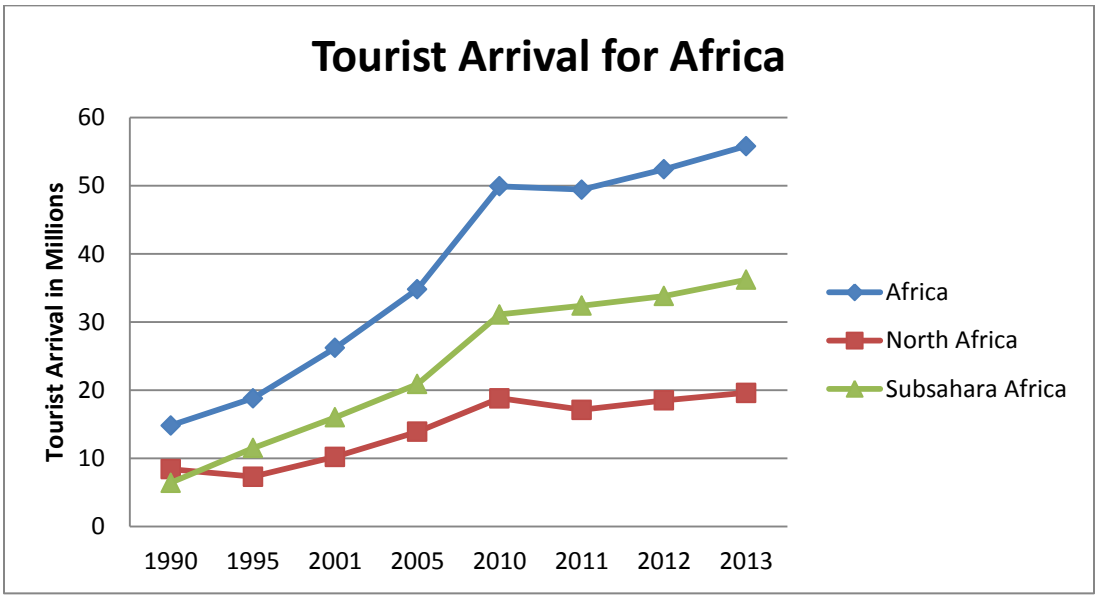


Fig 2-2: Tourist Arrival for Africa. Source: UNWTO, 2014

2.2. Tourism in Africa

Christie & Crompton, on their paper in titled (Tourism in Africa, 2001) has indicated "The quality of Africa's resource endowment for tourism is exceptional, but most countries have only barely developed their tourism potential. The continent receives about 5% of all international travelers and tourism receipts (UNWTO, 2012) but tourism is "significant" (>2% GDP and >5% exports) in about half of SSA countries. Countries in Africa are now focusing on tourism as a source of growth and diversification." In 2013 , Africa has attracted 5% more international tourist arrival, which is corresponding to 3 million .In over all ,the region received 56 million which is 5% of the world .North Africa received +6% ,sub-Saharan Africa is estimated to receive 5% (UNWTO ,2014) . Countries in Africa are now focusing on tourism as a source of growth and

diversification." Tourism in Africa has also been discussed By Karim, on his paper entitled a panel data analysis of demand for tourism in Africa Karim has Cited "Tourism in African continent has been seen as a means of enhancing economic growth and development (Kester, 2003) as well as launching the image of the continent to the outside world. African countries have started tapping the potentialities that is embedded in tourism and hospitalities. According to Kester (2003), tourism has the potential to contribute significantly to economic growth and development in Africa. (Naude and Saayman; 2004) opined that Africa's cultural and natural resource endowments are such that it ought to be benefiting largely from tourism" while Christie and Crompton; (2001) believe that African has an "exceptional" tourism potentials and that it is increasingly contributing to the continent's gross domestic products (GDP) and exports.

2.3. Tourism in Sub –Saharan Africa (SSA)

The Sub Saharans Africa (SSA) has a number of tourism products on offer: Wildlife Tourism, Scenic Tourism, Birding Tourism, Hiking, Resort and Beach Tourism, the Safari Tourism is a key product for East Africa and Southern Africa. The main East Africa safari destinations are Kenya and Tanzania. Resort tourism is also a key product in East Africa. The main East Africa resort destinations are Mauritius, Seychelles, and Mozambique. West Africa has small pockets of resort tourism in Cape Verde, Senegal, and The Gambia but mainly attracts business tourists. In Central Africa there is almost no resort or safari tourism, but business tourism is growing. Angola, Cameroon, Chad, and Republic of Congo are business destinations. Cultural tourism is perhaps the most underdeveloped key product. Every country has some cultural heritage attractions, indigenous culture, and/or craft products. Cultural tourism has the most potential

in the Sahel countries of West and East Africa. Where SSA appears to have a distinct competitive advantage, is in the delivery of combination products. Holidays which combine and extend traditional products with experience-based add-ons. Combo-holidays offer multiple experiences, and appeal to the growing segment of the market that is well-travelled, active, and interested in holidays that combine relaxation with adventure, culture, nature, or business. (Government of Kenya; 2013) Tourism is one of the key industries driving the current change in Africa and it could be a transformative tool within this takeoff. From a small base of just 6.7 million visitors in 1990, SSA attracted 36.2 million visitors in 2013 (UNWTO 2014)

2.4. An Over View Destinations in East & South Africa

The 2013 World Economic Forum (WEF) survey on global tourism and travel competitiveness shows that Kenya, Uganda, Rwanda, Tanzania and Burundi are trailing emerging global tourism giants in sub-Saharan Africa such as Seychelles, Mauritius and South Africa. On the other hand, the wider IGAD region is also well endowed with alternative tourism products that have remained relatively underexploited. Ethiopia, for instance, has abundant heritage tourism resources, for which it has been ranked highly globally at position 38, at par with Egypt which is well known globally for its predominantly heritage-based tourism resources, including the pyramids. Despite the high ranking of both destinations, Egypt continues to draw a large number of tourists compared to Ethiopia. In 2008, for instance, there were 12.2 million international tourist arrivals to Egypt compared to 330,000 to Ethiopia (UNWTO, 2012). Although other factors could explain the difference in arrivals, the deduction nonetheless suggests great potential for heritage tourism development in Ethiopia. Indeed, similar potential exists in Sudan, which also has a range of heritage attractions including temples, historical cities

and pyramids. This potential could further play a key role in tourism product differentiation within member countries to complement the overall image of the IGAD region as a tourist destination

2.4.1. Tourism Sector in Kenya

Kenya is one of the world‘s most popular tourism destinations due to its natural attractions, unique historical and archaeological sites, improving touristic infrastructure and its tradition of hospitality. The tourism industry has been one of the most important drivers behind Kenya‘s economic development over recent decades by reducing unemployment, raising national GDP and improving the country‘s balance of payments. Tourism is Kenya‘s third largest foreign exchange earner after tea and horticulture, and a major employer, accounting for about 12% of the total wage employment and 13.7%of the gross domestic product (GDP). Kenya‘s tourism greatly depends on its wilderness and wildlife, Kenya has 57 protected areas dispersed widely across the country that cover about 8% of the country‘s land area. Most of them are located in the Arid and Semi-Arid Lands. These parks and reserves are the basis of Kenya‘s thriving wildlife safari tourism. On average 1.5 million Tourists visit Kenya a year. Government of Kenya National Tourism Strategy (2013)

Number of foreigners visiting has increased consistently over the past decade. The government’s policy is to encourage tourism growth in terms of the number of tourists, yield and diversity of experience. Accordingly, the government has set target for the sector: to be among the top 10 long-haul tourist destinations offering a high-end, diverse, and distinctive visitor experience by 2030. Kenya’s strategic themes have been comprehensively addressed in its National Tourism Strategy 2013 to 2018 with an overriding philosophy of a dignified nation

geared towards wealth creation within this time frame; the international arrivals are projected to grow from below 2 million per year to 3 million per year. (I.e. The arrival is estimated to be 1.87 million in 2012, expected to reach 3.017 million by 2017).

2.4.2. Tourism Sector in Tanzania

The United Republic of Tanzania is located in eastern Africa, bordering the Indian Ocean between Kenya and Mozambique, and is home to some of the most spectacular natural features in both Africa and the globe. From the top of Africa's highest peak (5895 m), Mt. Kilimanjaro, through to the Serengeti plains, Ngorongoro Crater, and beaches of Zanzibar, Tanzania (Wadeetal, 1999)

Tanzania comprises the mainland country of Tanganyika and the island of Zanzibar, as well as a number of smaller offshore islands. The country has six World Heritage Sites. Only few countries in Africa have more: Wildlife Tourisms is the Main Tourism Activity In terms of activities, Tanzania is known as the home of Africa's most magnificent game reserves, fabulous national parks and the famous Ngorongoro Conservation Area. Beach tourism is the second most preferred activity, followed by mountain climbing.

Conservation is the primary role of Tanzania's twelve National Parks, which The National Parks account for 25 % of the land area. Tanzania developed as a tourism destination after Kenya, South Africa and Zimbabwe. The Ngorongoro Crater and the wildlife migration in the Serengeti, both of which are World Heritage Sites, were considered to be "unique wildlife viewing experiences". It has also, world-class marine assets in Zanzibar and a number of offshore islands. The Zanzibar Archipelago has the best resort assets in Tanzania. They are competitive with islands in the South Pacific and the Caribbean and within the Indian Ocean. Tanzanian

tourist statistic shows the number of visitors for Tanzania is steadily increasing from time to time there were 460,000 visitors in Jan/2000, the visitors number has increased to close to 625,000 by Jan/06; it has reached close to 775,000 by Jan/08 and has reached 783,000 by Jan/10 visitors number reaches close to 795,000 by Jan/2012.

2.4.3. Tourism sector in Uganda

The Ugandan economy has seen a major increase in tourist travel for both business and vacation purposes; Uganda has been endowed with a unique world-class natural environment, and therefore has the potential to obtain an economic rent from this tropical resource. High on the government's priority for economic development was a restoration of the tourist industry. Uganda has it all with respect to a total ecotourism experience; the country is the home to the endangered mountain gorilla, and the chimpanzee and ten other primates. Uganda has more than fifty large mammals and the birdlife is incomparable and is considered to be the finest birding country in Africa, with over thousand species. The source of the Nile River flows from Lake Victoria. Rafting, mountain hiking in the Rwenzori Mountains, visiting the rain forests and the many national parks are available in a country that sits on the equator. (Donald et al; 2013). Tourism activity in Uganda takes place mainly in and around protected areas (national park and games reserves).In terms of Fauna, Uganda is well endowed. A tourist cannot miss the big five (lion, leopard, buffalo, Rhinoceros and elephant). Uganda other attractions Include many natural equatorial forest reserve as well as wild life can be easily observed in the ten national park and the numerous game and forest reserves. The largest national park forest is Munichison (3840KM^2).Uganda has trying to maximize the advantage it has in forest resource for tourist attractions. There are five forest National park out of Ten National parks. Uganda

received 1,196,000 visitor arrivals in the year 2012 up from 1,151,000 visitor arrivals in the year 2011 representing an increase of 4%. Of these 108,000 visitors (9% of the total visitors) were recorded as having specifically come for tourism. When combined with those that were recorded under the category of "holiday", the percentage rose up to up 20%. (Mbambazi; 2013)

2.4.4. Tourism sector in South Africa

Tourism in South Africa has grown and become one of the country's main earners of foreign exchange and creators of employment. The growth in tourism to South Africa meant that the country is currently the main destination for tourists to the African continent (UNWTO).The growth rate in tourist arrivals has also surpassed that of the world average for more than a decade. The growth is fuelled by reasons that include hosting major events, while political turmoil and terrorist attacks in other parts of the world have had positive effects on South African arrivals. In addition, major markets started to change their travel trends; with an increasing number of tourists from developed countries visiting developing countries (UNWTO) it is clear that the country is experiencing significant growth. South Africa's potential for tourism is enormous but has been hampered by its history, economy and social and political setting. Known for its diamonds and gold (tourism attractions in themselves), South Africa's resource base for tourism is exceptional. Its tourism product relies on diversity for its appeal: accessible wildlife; varied and spectacular scenery, un spoilt wilderness areas; diverse cultures; and a climate varying from Mediterranean in the South to hot and dry elsewhere. There are unlimited opportunities for special interest activities (whale watching, sailing, fishing, white water rafting, hiking and bush survival, conservation and eco-tourism, wine tasting, golf). There are linkages with the rest of the economy, notably its agricultural produce (wines and fruits)

and its handicrafts, arts and cultural heritage. In addition, it has international class hotels and resorts for business, tourism and conferences; the quality of infrastructure, communication and health services is good; and the country has a fine network of national parks. Many of South Africa's attractions are world famous: Cape Town with its Table Mountain and the Cape of Good Hope; Sun City with world class resort facilities; Kruger National Park (the first of its kind in Africa); KwaZulu-Natal; the Garden Route and Maputaland. (Christie & Crompton; 2001)

An analysis of South Africa's main international tourism markets reveals that tourists from Africa are the main source of tourist arrivals – in particular tourists from neighboring countries. Tourists from overseas countries stem mostly from the United Kingdom, Germany, the Netherlands, the United States of America and France.

South Africa Tourism has been identified as one of the key sectors with excellent potential to enhance economic growth. The Tourism Sector Strategy which was launched in March 2011 aims at the sector's contribution to the economy from US $ 21 billion in 2009 to US $ 55 billion by 2020. Furthermore, the strategy is to increase the number of foreign tourist arrivals from seven million in 2009 to 15 million by 2020 and the number of domestic tourists from 14.6 million to 18 million. It is expected that some 225,000 new jobs will be created in the sector by 2020.

2.5. Tourism sector in Ethiopia

Ethiopia is the site of some of the oldest human settlements in Africa. Recorded Ethiopian history begins around BC 1000 of King Solomon and the Queen of Sheba, but relatively recent discoveries indicate the existence of a rich prehistory. Evidence of Ethiopia's culture and history is found in its ancient monuments, cities, and prehistoric sites, while its living culture is

reflected in the work of architects, musicians, writers, artisans and crafts people.(Christie & Crompton;2001)

The country has abundant heritage tourism resources, for which it has been ranked highly globally at position 38, at par with Egypt which is well known globally for its predominantly heritage-based tourism resources, including the pyramids. Despite the high ranking of both destinations in 2008, for instance, there were 12.2 million international tourist arrivals to Egypt compared to 330 000 to Ethiopia (UNWTO, 2012). Although other factors could explain the difference in arrivals, the deduction nonetheless suggests great potential for heritage tourism development in Ethiopia.

2.5.1. Ethiopian tourism sectors, Policy & strategy

Tourism is largely seen as a public good and thus the benefits can often extend deep into an economy, there are strong arguments to support the heavy involvement of national or local governments. (Lohmann & Duval; 2011) the Federal Democratic republic of Ethiopia Tourism development Policy recognizes this fact .The policy states that "Tourism Among the economic and social sector that, are registering rapid growth in the world." It high lights that Tourism makes a tremendous contribution serving as a source of Foreign Exchange, promoting micro and small scale enterprises, creating employment opportunities and ensuring sustainable development. However, the policy also recognizes "due to absence of clear policy thus far that would lay the direction for cooperation and coordination that should exist among the government, the private sector, the community at tourist attractions sites, the general public and other stake holders, it has not been possible for the country to derive full benefit from the sector" (FDRE, MOCT tourism development policy 2009) to address this short comings the

government of Ethiopia has adapted tourism development policy . Following the ratification of the policy the government later on establishes an operating arm called "Tourism Transformation council which is established by regulation on August 2013"(Reporter: 07 June 2014). Accordingly the Government is trying to achieve the goal set in the GTP plan. Which has an ambition to grow the tourism sector.

2.5.2. Policy and strategic Target

The National Tourism Policy and Strategy frame work has set the following.

Vision: To make Ethiopia one of the top five tourist destinations in Africa in 2020 through the development of its cultural wealth and natural attractions.

Mission; To study ,preserve, develop and promote the cultural wealth and national tourism attractions of the nations, nationalities and peoples of Ethiopia and build the positive image of Ethiopia with a view to adding a sustainable socio-economic and political values with popular and stakeholders' participation.

2.5.3. Attractions

Ethiopia is known for its full of varied Historical, Cultural and natural attractions. Historically; Ethiopia is old beyond imagination. It has three thousand years history. The giant stale of Axum testify that the AXUMITE Kingdom was one of the greats civilization of ancient world. Lalibelas Rockhewn church shows the religious civilization of the late middle age period.17th century castles of Gonder indicate the historical legacy of the country. Culturally it has diverse ethnic groups with their Religion, language, culture and tradition. Naturally the country offers magnificent scenery embracing contrasting land ranges from the Tops of rugged Semen Mountain to the depth of the Danakil depression, which is more than 100 meter below sea

level. On the other hand Ethiopia is the fourth largest BIO-diversity Zone in the world; it has more unique species of flora than any country in Africa. Among the different species 31 mammals, 17birds, 14reptiles 30 amphibians, 4 fish and about 1000 plants species are endemic to Ethiopia.

The country possesses nine of world heritage sites .Thus It possesses more World Heritage sites than even Egypt, but unfortunately they are not fully optimized at the moment. It is probably the only country in Africa who has claimed such number of World heritage sites. Ethiopia Rift valley is the source of many fossils findings attesting that it is the cradle of humankind; where humans Kind first began to walk upright. On top of all that, its people are hospitable and their cultures diversified a combination which makes it suitable for tourism development. It is a place where Nature, Culture and History merge to form a timeless appeal. (MOCT; Ethiopia; A tourist paradise)

2.5.4. Ethiopian Tourism Sector performance

Ethiopia's tourism sector is growing from a low base of a minimal 1 percent share of Africa's tourism market, but it continues to underperform despite its potential with 596341 total tourist arrivals in 2012 (MOCT 2013). Despite economic imbalances, such as the high inflation in previous years and limited access to financing for the private sector, Ethiopia's tourism sector has been showing a positive trend and steady growth in tourism arrivals and receipts (MOCT & WORLD BANK; 2012). The industry has emerged as one of the leading sectors that will drive the Ethiopian economy. It is now the third main source of foreign exchange earnings in Ethiopia (International visitors survey; MOCT 2013). The country has well-diversified source markets and tourism segments. This is a critical foundation for a resilient position with respect to

international volatilities. With regard to source; Africa provides the top source market 28.32 percent while the United States is currently the dominant source country (providing 19.21 percent of all tourists). Western Europe provides 13.13 percent while China & India follows with 5.92 and 3.22 percent respectively. (Tourism statistics bulletin; MOCT2013)

The Government has set ambitious growth targets for the tourism sector for 2015 that was expected to shape sector strategies. Ethiopia's National Growth and Transformation Plan (GTP) 2010-2015 has set ambitious targets for the tourism sector, to increase in tourism arrivals to 1 million, and a twelve-fold increase in tourists' expenditures, from US$250 million in 2010 to US$3 billion by 2015. However, the target seems a bit illusive to be caught-up within set time period. The Government In now set the sector as priority & in the process of revising the overall strategic plan .It has also establish new body called Ethiopian Tourist Organization to oversee & coordinate the sector activity .

Ethiopia's comparative advantage as a tourism destination is based on offering a safe, unspoiled and relatively unexplored "Africa in one country" experience, with Addis Ababa serving as a diplomatic capital and regional hub for air transport, while the country itself offers attractive complementarities with neighboring and well-marketed destinations such as Kenya and Tanzania.

2.5.5. Limitations of Ethiopian tourism sector

The current situation, relating to shortfalls in basic tourism supply in terms of destination development, products and services offered, expansion of infrastructure and tourist facilities shows, Although the country possesses vast potential in varied historical, cultural and natural attractions, this has not been adequately protected, developed and used as tourist attraction.

There is a serious shortage in number and type of tourist facilities at existing and potential tourist destinations and vicinities; moreover, the quality of service is poor unsatisfactory to tourists. Interpretations of tourist attractions are not based on credible facts and knowledge; they are not consistent; and their presentation is disorganized. Handicrafts, other local creative products, performing arts and entertainment services, which could have helped to lengthen the stay and increase the speed of visitors at every destination, are not offered in sufficient variety, quantity and quality.(MOCT; 2009)

2.6. Tourisms Terms & Definition

Tourism arises out of a movement of people to and their staying, various places or destination. There are two elements in tourism i.e. the journey to destination and the stay (including activities) at the destinations. The journey and the stay that take place outside the usual environment or normal place of residence and work, so that tourism gives rise to activities that are distinct from the resident and working population of the places through which they travel and stay. The movement to destination is temporary and short term in character and the intention is to return within few days or weeks. Destination is visited for the purpose other than taking up permanent residence or employment in the places visited. I. Venter on his thesis has cited, “tourism can be thought of as a whole range of individuals, business, organizations and place that combine in some way to deliver a travel experience. Tourism is a multidimensional, multifaceted activity. Which touches many lives and many different economic activities” (Cooper et al; 1998)”.

According to the definition of the World Tourism Organization (WTO), the term 'tourism' is used to describe the activities of persons travelling to and staying in places outside their usual

environment for not more than one consecutive year for leisure, business and other purposes. International tourism constitutes the temporary short-term movement of people to a country other than the one in which they normally live and work.

A visitor is any person who travels to a place outside his or her usual environment for a period not exceeding twelve months, and whose main purpose of their visit is anything other than the exercise of an activity that is remunerative. This covers two classes of visitors: 'tourists' and 'excursionists'. What constitutes a "tourist" is not as straightforward as it first appears. M. Paterson; 2004 on paper how clean & green is New Zealand Tourism Has cited various definitions which have been put forward by a number of authors (Hunziker 1951; Jafari 1977; Leiper 1990). However, the most widely accepted definition is the one used by the World Tourism Organization (WTO 1999, 2000), "**A tourist is any person travelling to a place other than that of his/her usual environment for less than twelve months and whose main purpose of trip is other than the exercise of an activity remunerated within the place visited."** There are different categories of tourist for example; a tourist whose main purpose of travel is for a holiday or vacation is holiday tourist. A tourist whose main purpose of travel is to visit friends or relatives is categorized under Visiting Friends or Relatives (VFR), a tourist whose main purpose of travel is the carrying out of some business activity is business tourist.

2.6.1. Tourist attractions

I. Venter on his paper entitled hotel development framework has also cited "attractions are arguably the most important in the tourism system. They are the main motivations for tourist trips and are the core of the tourism product. Without attractions there would be no need for other tourism services. Indeed tourism as such would not exist if it were not for attractions

(Swarbrooke; 1994). Attractions, in general tend to be single units or Individual sites that motivate large numbers of people to travel for a limited leisure time some distance from their home to clearly define and accessible small-scale geographical areas.

2.6.2. Attractions and Destination;

"Attractions are generally single units, individual sites or very small, easily delineated geographical area based on a single key feature. Destinations are larger areas that include a number of individual attractions together with the support services required by the tourists. There is a strong link between the two and it is usually the existence of a major attraction that tends to stimulate the development of destinations. Secondary attractions often spring up to exploit the market (Swardrooke, 2000). (Venter I, 2006)

2.6.3. Hospitality Industry

According to Barbara, the hospitality industry as defined "hospitality" is describe a cluster of service sector activities associated with the provision of food, drink and accommodation (Lashley and Morrison, 2002). The origin of the word "hotel" dates back to the 18th century when an establishment called "hôtelgarni in which apartments were let by the day, week or month, came into use. "Its appearance signified a departure from the customary method of accommodating guests in inns and similar hostelries, into something more luxurious and even ostentatious. The hotel industry is involved with providing overnight accommodation, food and beverage, various recreational and business facilities for travelers.

The American Hotel and Motel Association defined hotel as the following: "The hotel is an inn prepared according to law regulations in which a guest can find appropriate accommodation, food and other services for a certain fee". British law defined the hotel as "a place in which

traveler receives accommodation and food for a specified payable price while “Marcel Guti", a professional French researcher, has defined the hotel as "services aimed to provide suitable conditions for the public - sleep and food”. James and John defined hotel in their book (Travel and Lodging Law) as “an organization that provides accommodation”. (Abdul & Noorya; 2013)

2.6.4. Accommodation (Hotel) services

When a person travels to another place, city or country, he has different needs and demands from the city or the place in which he is travelling .The tourism industry is catering to satisfy the need of this traveler. A number of players are involved to satisfying this demand. Hotels are part of the hospitality sector and as such are major essential supply components of tourism. A hotel is a place that offers its facilities and services for sale. The services can vary from just one to various combinations that can all be thought of as a part of the total market concept of the hotel. Location is usually the main element, in the choice of hotel. Because it has ability to create convinces & draw customers. It is important that the location be visible, accessible, convenient and attractive. Hotel’s location is among the top factor that determining the success or failure of hotel. (Park; 2012) The Facilities of a hotel include the bedrooms, restaurants, bars, function and meeting rooms and recreation facilities such as a gym, tennis court and swimming pool. Depending on what kind of hotel is in question the facilities vary in number, type and size. Different visitors have different needs from the hotel and its facilities.

2.6.5. Tourism and Hotel industry

Ian Ventel on his paper entitled Hotel Development Frame work for successful development has cited cooper “In the context of tourism sector in general accommodation rarely has a place

and rational in its own right" Cooper et al (1998; 314) "It is rare for tourist to select to stay in hotel for the sake of staying in that specific Hotel. The choice of accommodation is made because it provide a supporting service for the main reason that brought the visitor to the destination. Whether it is for business or leisure. However, this doesn't mean accommodation is not important and necessary component in the development of tourism within any destination that seeks to serve visitors. An accommodation facility's quality and range could reflect and influence the mix of visitors to a destination". In this context, it important to recognize that the hotel industry is one of the infrastructural backbones of the tourist industry. It reflects the volatility and sensitivity to demand characteristic of tourism while on the supply side it is particularly lags in response. Hotel investment demands a long-term perspective. (Freeman & Felsentein; 2007) The tourism industry is characterized by severe shifts in demand that affects the forecasting of future investment. Within the tourism industry, the need for large-scale initial capital investment in the hotel sector, make the hotel industry particularly vulnerable to the periodic change of the tourism market. On the other hand, increasing tourism volumes by building additional hotels are often necessary in order for a destination to reach the level of "critical mass", whereby airlines are convinced to establish routes and tour operators decide to promote the destination. Although this is often viewed as a chicken and egg situation, hotels are a key factor in the equation. A certain volume of hotel rooms and visitors are also required in order to justify the sometimes large investments in infrastructure. (Christe & Crompton, 2001).

2.7. Tourism and Accommodation Infrastructure

Supply and demand is the fundamental concept behind any industry in the economy. In the hospitality (hotel) industry like any other industry, the forces of supply and demand drive entry and exit into and out of the industry. Therefore, Demand forecasting is crucial in making investment decisions to build new hotels. It can also help hotels that are struggling determine if recovery is possible and, if so, strategies to accomplish it. Accuracy in forecasting has proven to be somewhat of a problem, as many areas at different points in history have experienced supply booms that future demand cannot sustain. Supply of new hotels cannot be easily or rapidly adjusted on any large-scale basis because the addition of a hotel takes a large investment and long time. The process of building a hotel takes an average of four years from the preplanning stage through its opening date. (Julie & Vandergrift, 2004) whereas, the returns to hotel investment are inextricably linked to tourist demand (local and foreign). Therefore the relationship between the hotel industry and the wider tourism industry is two-directional. Without tourists there can be no hotel industry and without hotels there can be no tourism industry (Freeman and Felsenstein, 2007)

One relationship which provides overall indication needs to be addressed is that the relationship of hotel demand with the growth rate of the country. In the tourism demand literature, “Choi (2003) modelled the hotel industry growth in USA using economics and accounting variables as the leading indicators. Similarly, Jones and Chu Te (1995) used economics and social variables to determine the turning points in short-term overseas visits to Australia. Furthermore, several empirical papers namely Cho (2001), Kulendran and Witt

(2003a), Rossello-Nadal (2001) and Turner et al. (1997) used leading economic indicators to predict international tourism demand" (Leeyap; 2010)

The main variable that definitely influences tourist movements positively is growth in Gross National Product (GNP). GNP growth increases disposable income and hence the willingness and ability to consume various goods and services, including an increase in tourist demand, whether such a demand refers to number of arrivals and number of nights spent or to sums of tourist foreign exchange. (Nikolaos & Spiros) "Wheaton and Rossoff (1998) focused on the overall lodging industry when they studied the relationship to Gross Domestic Product (GDP). They examined both the demand and supply sides of the industry to determine if they moved with the economic cycles of the United States. Data during the period 1969 through 1994 showed that hotel room demand moved with Gross Domestic Product (GDP). According to this study, lodging demand grew 1.3 percent for every one percent rise in GDP. The supply side of the industry did not display the same correlation with GDP. "(Julie &Vandergrift, 2004)

Because rental rates for hotel properties are adjusted gradually in the long-run, instead of being adjusted for short-term economic fluctuations, the business cycle fails to affect hotel investment. The gradual adjustment explains why new investment, or supply, displays long-run movement. "Vogel (2001) reports that Gross National Product (GNP) is the measure most related to hotel room demand. For every one percent increase in GNP, there is a 0.75 percent increase in lodging demand. This is a statistic that can only be applied to the lodging industry as a whole, since GNP is a measure of the economy as a whole. Other studies have found relationships between hotel room demand and employment growth, disposable personal income and exchange" (Julie & Vandergrift, 2004).

2.8. Importance of forecasting for Tourism Industry

M. Cuhadar on his paper on modeling & forecasting in bound tourism demand has pointed out that "Forecasting tourism demand is important for tourism planning at all levels in the tourism industry from the government to a single tourist business. Effective forecasting provides credible and timely information for tourism managers to balance the market demand with the tourism supply. Strategic planners, policymakers, financing officers, and market analysts for tourism products are all required to monitor and project the changing tourism demand (Hu, 2002). The value of forecasting lies in its ability to reduce the loss caused by disparities between demand and supply. In order to provide satisfactory services to tourists, destinations need to acquire reliable forecasts of future demand for accommodation, transportation, service staff and other related travel services (Wang & Lim, 2005). Louw & Saayman; 2013 stated that a lack of knowledge of future tourist arrivals may lead to missed opportunities or an overestimation of tourism demand. Overestimating tourism demand may, for example, lead to excessive investment. Thus, forecasting is an integral part of the overall strategic planning process in the tourism industry. According to Viorica & Sorin, **"**Accurate demand forecasting is essential for efficient planning by tourism-related businesses, particularly given the perishable nature of the tourism product. Secondly, tourism investment, especially investment in destination infrastructures requires long-term financial commitments and the sunk costs can be very high if the investment projects fail to fulfill their objective. As a result, the prediction of long-term demand for tourism related infrastructures often forms an important part of the investment project appraisals. Thirdly, government macroeconomic policies largely depend on the relative importance of individual sectors within a destination. Hence, accurate forecasts of demand in

the tourism sector of the economy will help the government in formulating and implementing appropriate medium to long term tourism strategies."

2.9. An Overview of Forecasting & its classification

Forecast is a statement about the future value of a variable such as demand. It is a prediction about the future. The better those predictions, the more informed decisions can be. Therefore, Forecasting can be defined as a prediction of a future event. These predictions are very important for investors and governments who are trying to maximize income generation or financially plan for the future. For this reason forecasting is an integral part of decision making system and it is effective aid in efficient planning. Forecasts are made with reference to a specific time horizon. The time horizon may be short (a day, week, month, three month) Short term forecast usually deal with efficient use of resource. The medium term forecast deals with time frame the next six months, the next year or may cover periods less than two years & it usually deals with acquiring resources. (Stevenson 2012) Longer term forecast deal with time frame of the next two to five years, ten years or the life of a product or service, which mostly deals with the resource requirement. However, many forecasts are short term, covering a day or week. They pertain to ongoing operations & are especially helpful in planning and scheduling day-to-day operations. Whereas the medium term mostly deal with acquiring resource such as machinery and equipment requirements. The long-range forecasts are more of strategic planning tool. Long- term forecasts used for new products or services, new equipment, new facilities, or something else that will require a somewhat long lead time to develop, construct, or otherwise implement (Stevenson 2012). Forecasts are the basis for budgeting, planning capacity, sales, production and inventory, personnel, purchasing, and for many other activities.

Forecasts play an important role in the planning process because they enable managers to anticipate the future so they can plan accordingly. Therefore, Forecasting provides a tool to decrease dependence on chance and become more scientific to deal with the environment (Makridakis etal; 1998). It also affects decisions and activities throughout an organization. A wide variety of forecasting methods are available. It ranges from the most Naïve method, such as use of the most recent observation as a forecast to the highly complex approach such as neural network & econometric system of Simultaneous equation. (Makridakis etal, 1998) Forecasting is also highly important for the tourism industry, which needs accurate predictions of demand so that it can plan effectively from season to season, year to year. Accurate tourism demand forecasts improve the efficiency of businesses, increase profits and strengthen economies.

For tourism industry, the most useful information is normally how many people will be visiting an area or staying at an accommodation unit and how long will they be staying. Closely related to this are forecasts about what the tourists will do while they are staying in an area/resort/hotel. How many excursions might they go on? How much money will they be spending on excursions/food/ nightlife? Finally, it may also be useful to know if and how tourists are changing Tourism forecasting is also extremely useful for those working in promoting and managing the tourism industry. (UNWTO*& ETC, 2008)*

2.9.1. Forecasting Methods

There are three broad classes of forecasting methods available to the planner: statistical, judgmental, and econometric (Li G; 2009) on his paper Addressing "Tourism Demand Modeling and Forecasting, has indicated that Tourism demand forecasting methods are commonly divided into two categories: quantitative and qualitative methods (Song and Li, 2008; Ren and Liu, 2006b; Witt and Witt, 1995)". In the statistical category, widely used methods include smoothing, regression, and box-Jenkins, Extrapolative or Time series & causal or explanatory methods .Under Time series there come methods of Naïve, moving average ,Exponential smoothing ,Decomposition. There is also advanced time series method of, Browns DES & Box Jenkins methods. The Causal methods include methods of linear Regression, multiple regression as well as Econometric analysis. In general while quantitative Technique is mainly focused on analyzing objective, or hard, data. The "Qualitative methods did not require data like the same manner as quantitative forecast method did .The input required depend on the specific method and mainly the product of Judgment & accumulated Knowledge" (Makridakis etal, 1998). Qualitative method use different technique like interviews, executive opinion, cross impact analysis, Scenario building & Delphi method .However, it's main characteristics lies on its "inclusion of soft information that is human factors in the form of personal (Expert) opinions & hunches in the forecasting process".

2.9.2. Quantitative Methods

The quantitative forecasting methods organize information about previous events using mathematical rules. Under Quantitative method there are three main subcategories: time series models, econometric approaches and the Artificial intelligence (AI) techniques.

According to Li, The AI technology is a third branch of forecasting methodologies, which has been recently introduced into the tourism demand forecasting literature. The often used "AI techniques for forecasting include neural networks, rough sets, genetic algorithm, support vector regression, fuzzy logic, grey theory and their combinations (Goh; et al, 2008; Toshinori, 1998)"

According to M. Cuhadar; 2014 "Quantitative tourism demand forecasting methods can be classified into two sub-categories: causal econometric and time series methods. Econometric models identify the independent variables that could affect the values of a dependent variable and then estimate the relationship between the dependent and independent variables. The most common difficulty of applying the econometric methods is identifying the independent variables that affect the forecast variables. The data of many of these variables, such as price capacity and transportation costs, are not easily accessible and are often unavailable. Furthermore, the reliability of final forecast outputs will depend on the quality of other variables (Uysal & Crompton, 1985; Yeung & Law, 2005; Chen, 2006; Cang, 2013)". According to the complexities of the models and estimation techniques, time series forecasting methods can be further subdivided into basic and advanced categories. M. Chadar has also highlighted that "Time series methods use past patterns in data to extrapolate future values, whilst time series approaches are useful tools for tourism demand forecasting, cyclical and seasonal effects can distinctly be seen in time series as well as long-term upward or downward trends. Most widely used procedures in time series forecasting are the exponential smoothing and the autoregressive integrated moving average (ARIMA) models known as Box–Jenkins methodology (Burger et al., 2001; Lim & McAleer, 2001; Lim, 2002; Goh & Law, 2002; Cho, 2003; Smeral &

Wüger, 2005; Wang & Lim, 2005; Coshall, 2005; Oh & Morzuch, 2005; Huarng et al. 2006; Chu, 2009; Min, 2008; Goh & Law, 2011; Lin et al. 2011) ". Prior studies have shown that these methods are commonly used by tourism forecasters. In testing the accuracy of different forecasting models for tourist arrivals, researchers had found that time series models often generate acceptable forecasts at low cost with reasonable benefits (Law & Au, 1999; Burger et)M. Cuhadar;2014

2.9.2.1. Basic time series methods

Time series forecasting are also called extrapolative methods, because they extrapolate from previous data in the series to predict future trends. These models attempt to identify the patterns in the time series that cause shifts in the forecast variable and to see how they interact. The advantage of such models is that they are relatively simple to estimate, requiring no more than one data series (Peng Bo, 2012)

2.9.2.1.1. NAÏVE;

No-change models are used very frequently in tourism demand forecasting and, surprisingly, they often give the most accurate calculations. (UNWTO*& ETC, 2008)*

The Naive 1 (Or no change) model is the simplest forecasting value for the period **t** is equal to the actual value in the last period (t-1).The Naive 2 model is version of Naïve which is widely used but simple model employed when there is a continuous trend present in the data. The forecast value for period t is obtained by multiplying the demand over period t-1 by the growth rate between the period t-2 and the current period (t- 1). It assumes that growth rates remain unchanged from one time period to the next. (*UNWTO & ETC, 2008)*

2.9.2.1.2. Simple Moving Average (SMA)

The SMA method uses a simple arithmetic mean to estimate central tendency (UNWTO). Moving Average provides a simple Method for smoothing the "past history of data" the idea behind moving average is that observation which are nearby in time are also likely to be close in Value (Makridakis; etal 1998).

The model allows the past values of a variable to determine the forecast values with equal weights assigned to the former. The number of lagged observations included in the model determines its responsiveness and it is clear that the more lagged values that are included, the smoother the forecasts become. If a time series shows wide variations around a trend, including more lagged observations in the SMA model will help the model to pick up the trend. However, its main limitation is that it gives equal weight to the demand in each of the most recent period (Buffa & Sarin, 2011) which may not be realistic, as more recent lagged values tend to have a much bigger impact on the current values of a time series. Therefore, the SMA method normally generates more accurate forecasts where the time series is less volatile.

2.9.2.1.3. Single Exponential smoothing (SES)

The single exponential smoothing model is applicable when there is no trend or seasonality in the data. However, when the trend & seasonality component is not there what is remaining is the horizontal component or the base. There for the key objective in exponential smoothing model is to estimate the base and use that estimate for casting future demand (Buffa and Sarin; 2011). In a SES model, the forecast for period t is equal to the forecast for period (t-1) plus a smoothing constant multiplied by the forecasting error incurred in period (t-1). This is process of determining by taking "forecast for the previous period and adjust it using the forecast error.

that is the new forecast is simply the old forecast plus an adjustment for the error that occurred in the last forecast .here the past forecast error is used to correct the next forecast in direction opposite that of the error".(Makridakis; et al; 1998).

2.9.2.1.4. Decomposition

Decomposition is a mathematical term for separating (decomposing) a time series into its constituent parts. Statisticians refer to these parts as trends, cyclical elements, seasonal elements, and irregular effects. A forecaster is normally interested in the irregular component of a time series, which is often obscured by the trends, and cycles. If these can be removed, then it is often possible to directly compare data or use the 'de-trended' and 'de-cycled' data in other forecasting models (UNWTO*& ETC, 2008).* The trend component (T) in a time series is the long-run general movement caused by factors such as long-term economic trends, demography, weather, etc. It can often be approximated by a linear (straight line) model. The cyclical component (C) is wave-like movement around the central trend that may vary in amplitude and duration but often lasts for several years. It can be driven by factors such as long term economic cycles. The seasonal variations (S) are patterns repeated over fixed intervals of anything up to a year. They are often the result of weather (wet and dry seasons, summer and winter) and man-made conventions such as holidays.

The additive model is appropriate if the magnitude of the seasonal fluctuation does not vary with the level of the series. But if the seasonal fluctuation increase and decrease proportionally with increase and decrease proportionally with increase and decrease in the level of series, then multiplicative model are appropriate. (Makridakis, 1998)

Basic time series methods

No.	Forecasting Method	Equation	Legend
1	Naive	$F_t = At_{-1}$ ..... (1) $F_t = A_{t-1}*[1+ [(\frac{A_{t-1}-A_{t-2}}{A_{t-2}})]$ ... (2) $F_t = \boldsymbol{A_{t-m}}$ ... . (3)	Where: F = forecast value A = actual value t = some time period m = number of periods in a year
2	Simple moving Average (SMA)	$F_t = (A_{t-1} + A_{t-2} + ...A_{t-n}) /n$	Where: F = forecast value A = actual value t = some time period n = number of past time periods
3	Single Exponential smooth (SES)	$F_t = \alpha \times A_{t-1} + (1 - \alpha) \times F_{t-1}$	Where: F = forecast value A = actual value t = some time period α = smoothing constant between 0 and 1
4	Decomposition	$A_t = f (T_t, C_t, S_t,)$..... (General Equation) $A_t = T_t + C_t, + S_t$... (Additive Décomposition) $A_t = T_t * C_t, * S_t$ ... (Multiplicative decomposition)	A_t=time series actual data at period t T_t=trend component at period t. C_t=the cyclical component S_t=seasonality component t = time period (usually a month or a quarter)

Table 2-1 Basic time series methods

2.9.2.2. Advanced Forecasting Method

2.9.2.2.1. Double Exponential smoothing (DES)

When dealing with time series that shows simple increasing or decreasing (linear) trends over time single exponential smoothing may not be able to capture the variability accurately, and it may be necessary to use double exponential smoothing (DES). DES computes a smoothed level and trend at each data point and the forecast is made by using the last point in the data series to forecast one or two points ahead in the future. (UNWTO& *ETC, 2008)*The advantages of DES

are that, even though it is still relatively simple, it can still capture linear trends up or down, and can forecast several periods ahead. However, it cannot track non-linear trends, it fails to simulate stepped series, it cannot deal effectively with seasonality, and it does not incorporate causal relationships like all-time series methods.

2.9.2.2.2. Brown's method for double exponential smoothing (Brown's DES)

Holt's DES Model allows the trend and slope to be smoothed by different constants. The forecast for holt`s linear exponential smoothing is found using two smoothing constant, α, β (with values between 0 and 1) (Makridakis et al; 1998).However, Holt DES turns to brown`s DES in the special case of where α=β (Makridakis et al; 1998) Since the basic DES method only uses one constant, the estimated trend is very sensitive to random impacts, whereas Holt's version is more flexible in selecting the smoothing constants (Makridakis; etal 1998). The Holt`s DES allows Forecasting of data with trend. However, when Seasonality does exist this method is not appropriate. (Makridakis; etal) Bo, on her paper has cited "Holt-Winter's model (the triple exponential smoothing method) adds seasonal variation to Holt's model, and is appropriate when the time series has a linear trend with an additive seasonal pattern (Bowerman, O'Connell, & Koehler, 2005)". Holt`s method was extended by winters (1960) to capture seasonality directly. The holt-winters' method is based on three smoothing equations-one for the level, one for the trend and one for the seasonality. It is similar to Holt method, with one additional Equation to deal with seasonality. (Makridakis; etal).

2.9.2.2.3. ARMA or Box-Jenkins

ARMA models were popularized by Box and Jenkins from Great Britain, In 1972 George E. P. Box and Gwilym M. Jenkins developed a method for analyzing stationary Univariate time series data & there name have been used synonymously with the methodology since then. ARMA or Box-Jenkins, forecasting approach become popular due to its ability to handle any time series, its strong theoretical foundation and its operational success .The approach searches for the best combination of two forecasting methods and their parameters that minimize the error in simulating the past series. (Frechtling, 2001) the two forecasting methods refer to Auto regression and Moving Average and their associated parameters. 'Best' is to mean that, the most accurate for simulating the historical data by extrapolation, it should be the best at predicting future trends. (*UNWTO & ETC, 2008)* Auto regressive (AR) models can be effectively coupled with moving average (MA) models to form a general and useful class of time series models called autoregressive moving average (ARMA) models (Makridakisetal, 1998).These classes of models can be extended to non stationary series by allowing differencing of the data series. These are called Autoregressive integrated moving average (ARIMA) models (Makridakisetal, 1998). According to M. Cuhadar " The ARIMA model building method is an empirically driven methodology of systematically identifying, estimating, and diagnosing and forecasting time series & ARIMA is concerned with iteratively building a parsimonious model that accurately represents the past and future patterns of a time series (Louvieris, 2002)"

The Box-Jenkins model is the most frequently used time series approach in tourism demand forecasting. It is considered relatively sophisticated, with the ARMA process as its basic form. Box-Jenkins forecasting models are identified by examining the behavior of the autocorrelation

function (AF) and partial autocorrelation function (PAF) of a stationary time series. The time series must be stationary for the classical Box-Jenkins model to be used. (Peng 2013) This means it must have a constant mean and variance. If a time series is non stationary, it should be differenced until it becomes so. According to M. CHADAR, “If the process is non stationary, it is necessarily transformed to a stationary series before conducting their modeling processes. Differencing process is employed to transform a non stationary series into a stationary one. The order of a differencing process is the number of times of differenced before achieving stationarty. Differencing processes for AR, MA, or ARMA models are also the so-called integrated processes and are named as ARI, IMA, and ARIMA, respectively (Hong, 2013). The general form of the ARIMA models is written as the following formulas (Aslanargun; etal. 2007): ARIMA (p, d, q) (P, D, Q) s”. Cuhadar has also explained the methodology by citing (Chen etal 2008, De Gooijer & Hyndman, 2006). Accordingly to him, “Both the autoregressive (AR) and moving average (MA) models are useful forms of the Box-Jenkins model, and AF and PAF are used to determine whether the time series is an AR, MA, or ARMA process. When the PAF drops off to 0 after lag p, this indicates that it is an AR (p) process while if AF drops off to 0 after lag q, this denotes a MA (q) process (Chen et al., 2008). The advantage of the Box-Jenkins method is not only that these models can track the behavior of a diverse range of time series, but also that they require fewer parameters to be estimated in the final model. Such statistics as the Akaike information criterion (AIC), Akaike final prediction error (AFPE), and Bayesian information criterion (BIC) are used to add mathematical rigor to the process of identifying an appropriate ARMA or ARIMA model (De Gooijer & Hyndman, 2006). Since seasonality is an

important feature in most of the time series (such as tourism), seasonal ARIMA (SARIMA) has also gained popularity in recent years".

No.	Forecasting Method	Equation	Legend
1	Brown`s DES	$Y_t = \alpha A_{t-1} + (1-\alpha) Y_{t-1}$ $Y'_t = \alpha Y_{t-1} + (1-\alpha) Y'_{t-1}$ $C_t = Y_t + (Y_t - Y'_t)$ $T_t = [(1-\alpha)/\alpha]*(Y_t - Y'_t)$ $F_{t+n} = C_t + n*T_t$	Where ; F_t=Forecast at time t: A_t=actual value at time t; Y_t=SES seriesat time t; Y't=DES sériés at time t; C_t=the intercept; T_t=the slope coefficient; n=the number of forecast period;
2	Holt DES Equations. Holt-winters equation	$L_t = \alpha A_t + (1-\alpha)(L_{t-1}+b_{t-1})$ $b_t = \beta (L_t - L_{t-1}) + (1-\beta) bt_{-1}$ $F_{t+n} = L_t + n*b_t$ $L_t = \alpha (A_t - Sn_{t-h}) + (1-\alpha)(L_{t-1}+b_{t-1})$ $b_t = \beta (L_t - L_{t-1}) + (1-\beta) b_{t-1}$ $S n_t = \gamma (A_t - L_t) + (1-\gamma) Sn_{t-h}$ $F_{t+n} = L_t + n* b_t + S n_{t+n-h.}$	Where; F_{t+n}=Forecast for n period ahead. A_t=actual value at time t. n=the number of forecast period; L_t=smoothed value at time t (level); B_t=trend estimate at period t (trend); Sn_t=seasonal variation at time t; h=is the length of seasonality α,β,ϒ are smoother constant;
3	Box-Jenkins Equation (ARMA)	$A_t = d + a_1 A_{t-1} + a_2 A_{t-2} + \ldots\ldots + a_p A_{t-p} - b_1 e_{t-1} - b_2 e_{t-2} - \ldots - b_q e_{t-q}$ (ARIMA) Notation ARIMA (p, d, q)(P,D,Q)s	Where ; A_t=actual value at time t; p = the number of parameters in the autoregressive (AR) model, d= the differencing degree, q= the number of parameters in MA model, P= the number of parameters in AR seasonal model, D= the seasonal differencing degree, Q=the number of parameters in MA seasonal model, and s the period of seasonality.
4	Basic structure of time series.	$F_t = \mu_t + \gamma_t + \Psi_t + \epsilon_t$	F_t=Forecast at time t; μ_t, γ_t, Ψ_t, $\epsilon_t$denotes the trend, seasonal, cyclical and irregular component respectively.

Table 2-2 Advance Forecasting Methods

Source; Peng Bo (2013)

2.9.3. Causal methods (Explanatory Models)

A causal (explanatory) model is a model that relates output to input. The method facilitates a better understanding of the situation and allows experimentation with the different combination 0f input to study their effect on the forecasts. (Makridakis; etal 1998), the factors

of input used in casual models are of several types. Although time series approaches are useful tools in tourism demand forecasting, their major limitation is that their construction is not based on any economic theory that underlines tourists' decision-making processes (Peng Bo). Thus, uses of decision making variables or factors are very good reasons to use causal models as opposed to univariant analysis. If one knows the relationship between several independent variables and demand, one can start to create a variety of forecasts for different potential scenarios.

Forecasting based on regression methods establishes a forecasting function called a regression equation. The regression equations express the series to be forecasted in terms of other series that presumably control or cause the dependent variable. "The central idea in regression analysis is to identify variables that influence the variable to be forecasted and establish the relationship between them so that the known values of the independent variables can be used to estimate the unknown values or forecasted value of the dependent variable. (Buffa & Sarin, 2011) .If only one independent variable is used to estimate the dependent variable the relationship between the two is established using simple regression analysis. If several factors or independent variable is used to estimate the single defendant variable then the relationship is established using the multiple regression analysis.

On the other hand there are many situation (tourism among others) which require More than one variable to be forecasted and more than one explanatory variable to be used, such situation often call for set of equation which are solved simultaneously ,which is known as Econometric modeling .(Makridakisl etal ;1998).

2.9.3.1. Linear Regression

The most commonly used method for quantifying the relationship between two variables is known as Linear Regression where the relationship between a dependent and one or more independent variables can be represented by an equation that describes a straight (linear) line (*UNWTO & ETC, 2008)* At its simplest, linear regression can be used in the same way as the extrapolative methods using time as the independent variable. This is sometimes referred to as simple or univariant regression. The objective in linear regression is to obtain an equation of a straight line that minimizes the sum of squared vertical deviations of data points from the line (i.e., the least squares criterion).

2.9.3.2. Multiple Regressions

Since Simple regression use only one (single) variable, it is not very useful beyond analyzing time series trends, For example tourism demand is affected by many variables, not just one. The way to deal with such problem is to include many more factors in the regression analysis, which is to use Multiple Regression forecasting method. In fact, Simple regression equation is a special case of multiple regression equation.

No.	Method	Equation	Legend
1	-Equation for simple regression model -Equation for a multiple regression model	$Y= a + b_1 x + e$ $Y = a + b_1 X_1 + b_2 x_2 +…+ b_n X_n + e$	Where: Y = the dependent (forecast) variable a = the intercept constant b = slope coefficient X = independent variable n = number of independent variables e= residual

Table 2-3 Simple and Multiple Regressions Method.

2.9.3.3. Econometric Model

As Simple regression is a special case of multiple regression Equation, Multiple regression equation is also special case of econometric modeling. While multiple regression involve a single equation, Econometric models can include any number of simultaneous multiple regression equations (Makridakis; etal1998).

The main advantage of econometric model lies in their ability to deal with interdependencies. Econometric model for tourism forecasting could involves factors like Comparative price, demographic factor, geographic factor, cultural heritage, media & communication factors. Buijze R; 2010, on his thesis of Governments and tourism has cited "Vanhove (2005) distinguishes Nine determinant factor and (song & witt, 2006) has indicated variables like I) Discretionary income, II) Prices of substitute goods, III) The marketing of the destination. IV) The word- of- mouth variable" are factors which have significant infulence and thus they are determinant.

Although it difficult to enumerate all the factors, Econometric equation for Tourism demand can be expressed as

Econometric Equation
Tourism demand = f (Economic factors (discretionary income, Prices of substitute goods), Time availability, Geographic factors, Demographic factors, Social and cultural factors, Infrastructure (transport, hospitality industry) Government and regulatory factors, Media communications and information, Unique characteristics

As it has been indicated, it is very hard to find all the determinants that influence tourism demand and identify their influence. Besides that, we can identify the determinants of tourism demand for a large part, but it is almost impossible to find indicators for these determinants and measure them accurately. (Buijze R 2010)

2.9.4. Qualitative Method

In situations, where there is no historical record It become necessary to rely solely on judgment and opinion to make forecasts. When forecast are required quickly, there may not be enough time to gather and analyze quantitative data. New product suffers from the absence of historical data that would be useful in forecasting. In Longer term forecasting the past data may not be representative of the future thus long term forecast require different approach ,as things can happen that substantially change established pattern or existing relationship. In such circumstance quantitative method won`t be the preferred method to provide the required forecast, there for the use of more subjective methods (qualitative) technique will be required to be used.

Successful strategy and effective long term planning such as capital budgeting require figuring out the implication of long term trends and distinguishing such trends from the various cycles associated with them. (Makridakis; 1998) .long term forecasting require an open mind so that a realistic and accurate picture of what is to come can be formed, debated and once crystallized, used to develop foresight. This for sight is in turn, indispensable for planning the long-term and formulating realistic strategies to anticipate forthcoming major changes and prepare organizations to adapt to such changes as painlessly and successfully as possible. (Makridakis, 1998)

Qualitative methods use qualitative information such as executive experiences, expert opinion, special events and records of comparable products, Scenario planning, and may or may not take the past into consideration. Generally, no historical product demand data is required to conduct qualitative forecasting methods. Due to its application for the purpose & for sake of simplification only scenario planning is discussed here under.

2.9.4.1. Scenario planning

Scenarios are an attempt to visualize a number of possible future and consider their implications. Scenarios are based in part on objective information and in part on subjective interpretation and specific assumption. a major purpose of scenarios is to challenge conventional thinking and avoid extrapolating into the future in a linear fashion. (Makridakis, 1998) Scenario Planning can be applied to virtually any area of tourism forecasting. It works by constructing alternative possible futures, or scenarios, for the tourism industry based upon information from a wide variety of sources, including experts' opinion. Scenario Planning deals with one of the biggest problems of many quantitative methods: the reliance on a single forecasting point with a range of uncertainty (UNWTO &ETC; 2008)

2.9.5. Forecasting methods selection

In the literature on forecasting method selection, there are two topics that attract the highest priority. They are: comparing the track record of various approaches to select forecasting methods, and using different types of data to estimate a relationship between data features and model performance (quantitative models with explanatory variables (Wang, etal) .To select a forecasting method, Armstrong has published some general guidelines - consisting of many factors: convenience, market popularity, structured judgment, statistical criteria, relative track

records and guidelines from prior research (Armstrong 2001). On the selection of forecasting method, based on experts' practical experience, some checklists for selecting the best forecasting method in a given situation are recommended as guidelines for selecting forecasting methods (Wang, etal). Armstrong has developed the flowing flow chart to guide forecasters in selecting among ten forecasting methods.

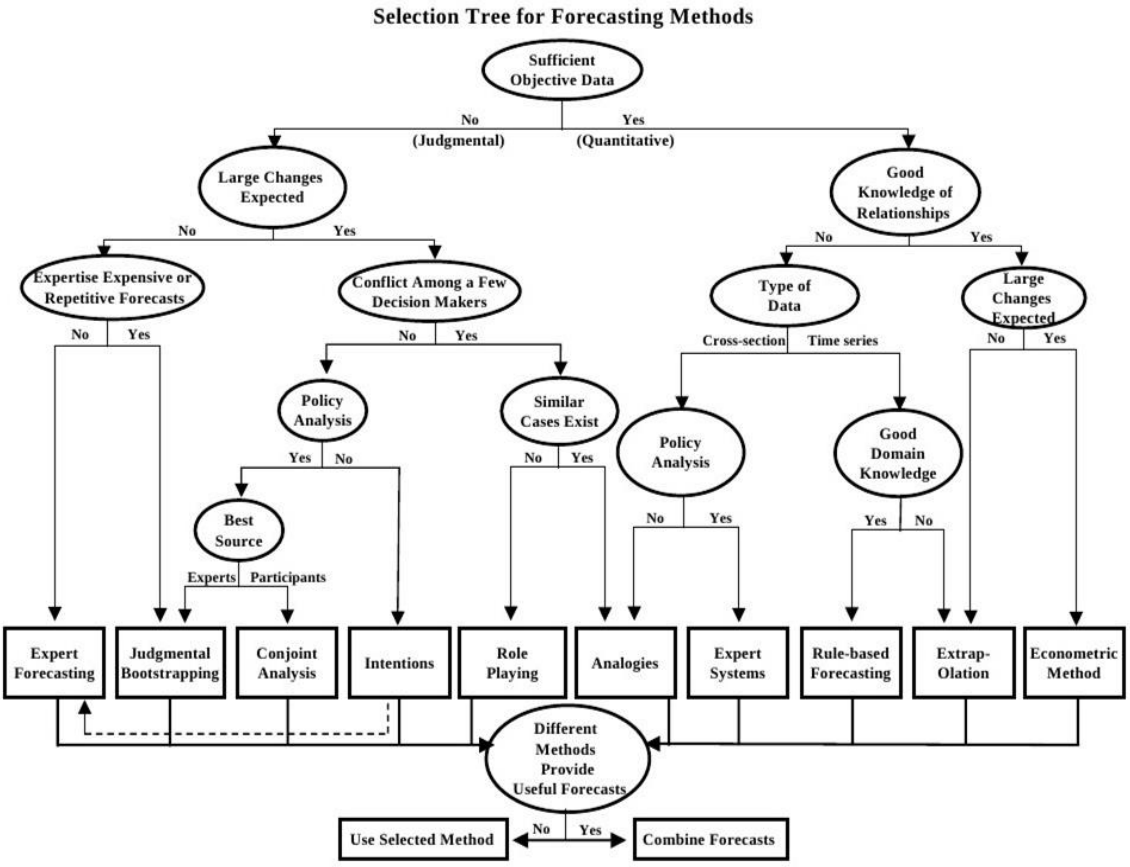


Fig 2-3 Selection tree for forecasting methods .Source: JArmstrong;2001

Armstrong`s key findings shows Given enough data, quantitative methods are more accurate than judgmental methods. When large changes are expected, causal methods are more accurate than naive methods. Simple methods are preferable to complex methods; they are easier to understand, less expensive, and seldom less accurate. To select a judgmental method,

determine whether there are large changes, frequent forecasts, conflicts among decision makers, and policy considerations. To select a quantitative method, consider the level of knowledge about relationships, the amount of change involved, the type of data, the need for policy analysis, and the extent of domain knowledge. When selection is difficult, combine forecasts from different methods.

Fretchling on his book Forecasting Tourism Demand Method and strategies (Frechtling 2001) has discussed selection procedure. Proposed preliminary selection criteria to narrow the list of available methods down to a few key approach. The Approaches use five key criteria;

Preliminary selection criteria

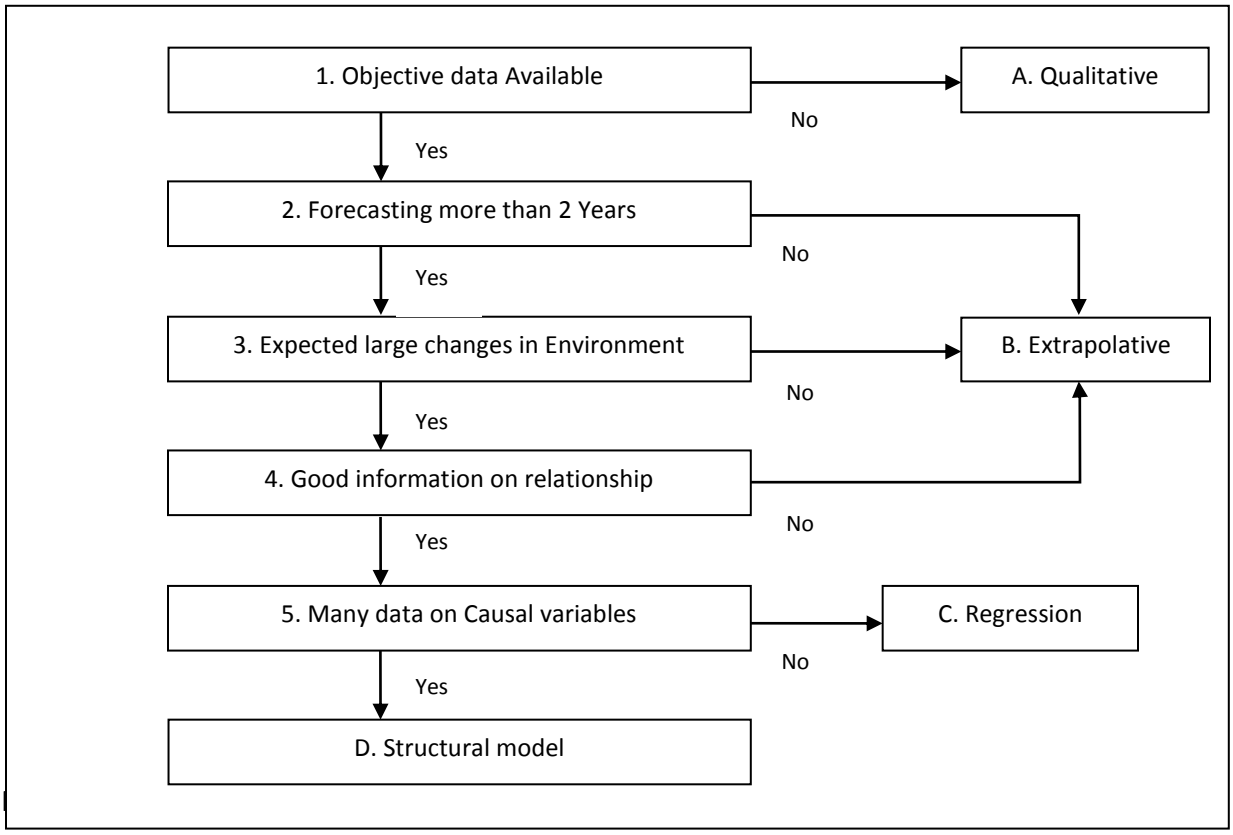


FIG 2-4 Preliminary selection criteria for forecasting methods

Source: Frechtling 2001

The criteria's used are the following

1. Objective data Availability which is also similar to Armstrong preliminary identification criteria between the quantitative & qualitative methods. Objective data refers to, Are numerical measures of the past activities which is intended to be used to forecast produce objective measurement technique rather than someone`s opinion or subjective judgment.
2. Forecast Horizon, Which refers to the most distance time period required to be forecasted.
3. Expected Large changes in the environment refer to future forces likely to change relationship among the forecast variable & the factors that influence them. These include major economic expansion and recessions, tax and regulatory policies, price inflation, available of key commodities such as petroleum, and terrorist threats & attacks among others.
4. Good Information on relationship refers to How much is known about which variable affect the variable which is intended to be forecasted & how they do so. Here it is important to know that what is causing the change in the variable we are trying to forecast.
5. Finally, many data on causal variables; this refers to how long the time series are on the factor that influence the forecast variable.

From both selecting diagram or procedure (Armstrong as well as Fretchling) it is possible to see that for time series data such as tourist arrival, the recommended forecasting method is Quantitative method specifically the Extrapolation method. However, Extrapolation by itself is not single method it is an umbrella name for Different methods which are applicable for TIME SERIES. Which covers; Naïve, single moving average, single exponential smoothing, double exponential smoothing & autoregressive.

Frechtling on discussion on Basic extrapolative & decomposition method high light that although there use is relatively simple and easy, there is also significant list of application for them these methods have their own short comings & are not suited for dealing with the widest range of tourism demand time series (Frechtling 2001).

On the other hand, Hand book of forecasting Methodology ,has put the following on conclusion remark of simple Extrapolative methods, " simple extrapolative methods have many drawbacks, especially if the historical trend of the dependent variable is complex, they are very easy to use and have good predictive power, especially for short-term forecasts. They are also commonly used as a control method when assessing whether other forecasting methods are worth using." (UNWTO, ETC 2008).In addition When dealing with time series that shows simple increasing or decreasing (linear) trends over time single exponential smoothing may not be able to capture the variability accurately, and it may be necessary to use double exponential smoothing (DES). DES computes a smoothed level and trend at each data point and the forecast is made by using the last point in the data series to forecast one or two points ahead in the future. The advantages of DES is that, even though it is still relatively simple, it can still capture linear trends up or down, and can forecast several periods ahead. However, it cannot track non-linear trends, it fails to simulate stepped series, it cannot deal effectively with seasonality, and it does not incorporate causal relationships like all-time series methods" (UNWTO & ETC 2008). The various extrapolative methods discussed (Including decomposition & Double exponential smoothing) are generally not very good at dealing with situations where tourism demand does not follow a simple trend over time. Of course, the time series can be decomposed first, but this is only one of the ways to deal with issues such as seasonality, cycles and complex trends

(UNWTO & ETC 2008). In light all the points raised on simple (basic) as well as intermediate Extrapolative methods, the circumstances lead towards an advanced extrapolative method i.e. the Box –Jenkins & causal approach. However, since the main interest here is to select modeling methodology for tourism data analysis (Tourist Arrival) and also that the data type is univariant time series, the appropriate method to be used is the Box-Jenkins approach, which by itself is a combination of two forecasting methods auto regression and moving average. It is important to note that, other than the technical requirement, choosing an appropriate methodology is not always straightforward. For instance, it may not always be as simple as choosing which method will give the best forecast but rather which is the best method given the time, money and/or expertise available (UN WTO & ETC 2008).

In summary, choice of forecasting methodology is inevitably a compromise between time, available budget, and the amount of expertise available. Since most forecasting requires data, or at least information, the first decision to make is whether all the needed information is available.

Once a decision is reached on the approach or methodology to be used, The next procedure is to follow the detail requirement of the selected model .This will be more working on the specification of the model based up on historical data patterns.

CHAPTER THREE

3. Methodology

3.1 Basic Concept & Definition of Time Series

Time Series, Time scale and Data Collection

A time series can be defined as an ordered sequence of values of a variable observed at equally spaced time interval (Frechtling 2001): It is collection of observations/measurements of a variable obtained through repeated measurements over time (UNWTO &ETC 2008); Sequence of observation over time (Makridaki etal 1998). In case of tourism forecasting, the most relevant type of time series is that of the dependent variable. It is important to note that the time series measurements have to be collected at regular time intervals and that irregularly collected information or single observations have very little use for forecasting. Time is the most important independent variable in tourism forecasting. Indeed, most of the simple quantitative tourism forecasting methods use past-trends in tourism demand – known as a time series or time series data – to predict what the future trends will be Time series data is therefore essential for most types of tourism demand forecasting.

Another important element is data collection, the frequency with which data is collected depends on the type of forecast being made and could be annual, quarterly, and monthly or even weekly depending on available resources and the level of precision required for the forecast.

3.1.1. Seasonality

Seasonality is defined as a pattern that repeat itself over fixed interval (Makirdais 1998), it refers to movement in a time series during a particular time year that recur similarly each year

(Fretchling 2001, Moore 1989). Seasonality is a notable characteristic of tourism demand and cannot be ignored in the modeling process when monthly or quarterly data are used. How to handle the seasonal fluctuations of tourism data has always been an important and complex issue in tourism demand analysis. (Song & Li) Seasonal pattern could come due to climate and weather, social customs, and holidays, business customs and the calendar. The Seasonal patterns exist when a time series is influenced by these factors (Makirdaks etal; 1998). In the tourism demand forecasting literature, seasonality is often treated either as a deterministic component or a stochastic component in the time series. If seasonality is considered as stochastic, the time series needs to be seasonally differenced to account for seasonal unit roots in the time series. If the seasonality is regarded as deterministic, introducing seasonal dummies into the time series models would be sufficient in accounting for the seasonal variations (song &Li). The seasonal patterns which occur regularly often obscure the underlying trend which is intended to be forecasted. Consequently it is wise to remove seasonality from the monthly or quarterly or sub annual series to get the seasonally adjusted series that is better suited for forecasting. (Frechtling 2001) When the series is characterized by a substantial regular annual variation, one must control for the seasonality as well as trend in order to forecast. Forecasting with such series requires seasonal adjustment (Deseasonalization). (Yaffee & Mcgee; 1999).The purpose of seasonal adjustment is to remove systematic calendar related variation associated with the time of the year, i.e. seasonal effects. This facilitates comparisons between consecutive time periods (TSAB, 2007).

Time series models; a time series model explains a variable with regard to its own past and a random disturbance term. Time series forecasting treats the system as black box and makes no

attempt to discover the factors affecting its behavior. There for, prediction of the future is based on past values of variable and/or past errors, but no explanatory variables which affect the system. The objective of such time series forecasting methods is to discover the pattern in historical data series and extrapolate that pattern into the future. (Makridakis etal 1998).

Time series models have been widely used for tourism demand forecasting in the past four decades with the dominance of the integrated autoregressive moving-average models (ARIMAs) proposed by Box and Jenkins (1970). Different versions of the ARIMA models have been applied in over two-thirds of the post-2000 studies that utilized the time series forecasting techniques (H. Song & G.li). Depending on the frequency of the time series, either simple ARIMA or Seasonal ARIMA (i.e. SARIMA) models could be used with the latter gaining an increasing popularity over the last few years, as seasonality is such a dominant feature of the tourism industry that decision makers are very much interested in the seasonal variation in tourism demand.

3.2 BOX-JENKINS ARMA PROCESS

The Box –Jenkins approach uses two methods Auto regression and moving average (The moving average in the case of B & J approached is different from the standardized MA .It rather uses Error series e_t (Makridakis; etal 1998).The process uses the two methods to recommend the best or the most appropriate form of forecasting model.

MODEL	Equation
Auto regressive	$A_t=a+b_1A_{t-1}+b_2A_{t-}+\ldots\ldots\ldots+b_nA_{t-n}$
Moving average	$A_t =a+e_t-c_1e_{t-1}-c_2e_{t-2}-\ldots\ldots-c_me_{t-m}$
ARMA	$A_t=a+b_1A_{t-1}+b_2A_{t-}+\ldots. +b_nA_{t-n}+ e_t-c_1e_{t-1}-c_2e_{t-2}-\ldots.-c_me_{t-m}$
ARIMA Notation	ARIMA (p, d, q)(P,D,Q)s

Table 3-1 Box-Jenkins Method

Where

A=Actual value; a=a constant identifying through computational iteration; b=a constant identifying through computational iteration; c=a constant identifying through computational iteration; e=error term; t=some time period; n=number of past actual value included; m=number of past errors value included; p= Order of non seasonal auto regressive; P= Order of seasonal auto regressive

ARMA model can only deal with time series stationary in their mean and variances. When the series is not stationairy, differencing is used to achieve stationary.

3.2.1. Differencing

Differencing is computed by subtracting the first historical value from the second, and the second from the third .etc and the resulting series examined for stationary in the mean. If the differenced series does not appear stationary, then the first difference series is differenced again and the resulting series inspected for stationary. The number of times a series must be differenced to achieve stationary series is called Integration index. On the other hand stationary of the variance is also to be checked. Some series are not stationary in their variance. That is the size of their fluctuation grows with time, even if their mean is stationary. The common solution for none stationary in variance is to transform the series into logarithms. (Fretchling 2001)

First Difference: $Z_t = Y_t - Y_{t-1}$ Where t=2, 3...n

Second Difference: $Z_t = (Y_t - Y_{t-1}) - (Y_{t-1} - Y_{t-2})$ where t=3, 4 …n

3.2.2 Auto correlation Function:-the key statistic in time series analysis is auto correlation function (correlation of the function with itself).Auto correlation shows the structural

relationship between observations in the stationary series k distance apart. The auto correlation function is a valuable tool for investigating properties of an empirical time series.

Auto correlation function (ACF)

$$r_k = \frac{\sum_{t=k+1}^{n}(Y_t - \bar{Y})(Y_{t-k} - \bar{Y})}{\sum_{t=1}^{n}(Y_t - \bar{Y})^2}.$$

Partial auto correlation function: is another useful statistic for investigating the correlation structure of stationary process .It measures the autocorrelation between the variables $Y_t$and Y_{t-K} their mutual linear dependency on the intervening variables 1,2,3..k-1 is removed.

3.2.3 <u>White noise model</u>: is a simple random model where observation Y_t is made up of two parts an overall level, C, and a random error component e_t, which is uncorrelated from period to period;

$$Y_t = C + e_t$$

White noise model is fundamental to many techniques in time series analysis. Any good forecasting model should have forecast error which follows a white noise model. (Makridkis; etal 1998)

With time series which is white noise, the sampling theory of r_k is known and the properties of the ACF can be studied for this model. Theoretically, all autocorrelation coefficient for series of random numbers must be zero. But as we have finite samples, each of the sample auto correlations will not be zero. (Makridikis et al 1998) If a stationary process Y_t has no correlation structure but simply a random variable with constant mean (usually assumed to be zero) and constant variance δ^2,then r_0=1 and r_k=0 for all values of K≥ 1.such a process is called a white noise process. In this case the standard error would be

$$S_{rk} = \frac{1}{\sqrt{n}}$$

Where n= is the number of observation in the series. This information can be used to develop test of hypothesis similar to those of the F –test and the T-test (Makridakis; etal 1998).

An individual auto correlation between data points at any given distance apart is dimmed significant at the 95% percent confidence level if it is value falls outside of the range. Any correlation value within the range of the boundary value, $\pm\frac{1.96}{\sqrt{n}}$ or that did not exceed this line are not significantly different from zero at the 95% confidence interval (or 0.05 level of significance) (Frechtling 2001).

$$-\frac{1.96}{\sqrt{n}} < r < \frac{1.96}{\sqrt{n}}$$

Where n = number of data points or observations,

r = autocorrelation value

3.2.4 <u>Diagnostic</u>: - Model diagnostic involves checking the validity of the white noise process. It`s process of verification if the ACF & PACF of residuals fall within the confidence interval, which indicate that the residuals are uncorrelated or white noise.

Portmanteau test:-Portmanteau test is a test of the whole r_k values at one time. It tests whether the set is significantly different from a zero set. Common portmanteau test is Box-pierce test which is based on the Box-pierce Q statistic.

$$Q = n\sum_{k=1}^{h} r_k^2 \; ;$$

The Box pierce test was designed By Box and pierce (1970) for testing residual from forecast model. An alternative portmanteau test is Ljung-Box test due to Ljung and Box (1978). They

have argued alternative statistic has distribution closer to the Chi-square distribution than does the Q statistic. (Makridakis; etal 1998)

$$Q^* = n(n+2)\sum_{k=1}^{h}(n-k)^{-1}r_k^2\ ;$$

3.3 **<u>Modeling approach (Procedure);</u>** the bases of box Jenkins approach to modeling time series is summarized in the diagram. The procedure involves.

- Phase 1 (Identification)
  - Data preparation
  - Model selection
- Phase 2 (Estimation and testing)
  - Estimation
  - Diagnostic
- Phase 3 (application)
  - Forecasting

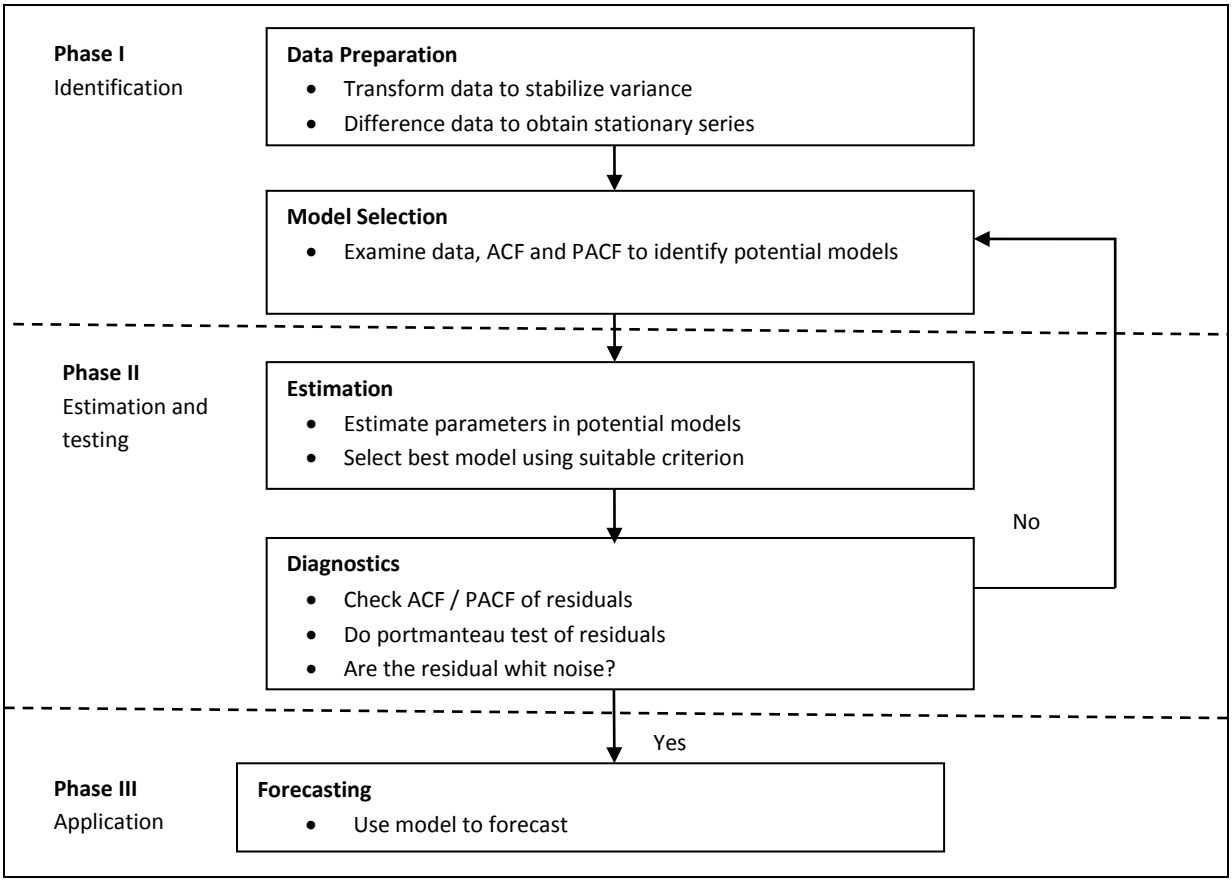


Fig 3-1 Schematic diagram of box–Jenkins methodology for time series modeling

Source; (Makridakis; etal 1998)

3.3.1. **Identification** (phase I) is the first step in modeling process .This step involves plotting of the data .identify any unusual observation & deciding if a transformation is required or not. If the time series shows data scattered horizontally around constant mean it indicate the data is stationary. If not it is necessary to transforming through (Differencing & log transformation) to achieve stationary series.

The next process would be Model selection; this step involves examination of the pattern of ACF & PACF. The plot of ACF & PACF indicate certain characteristics. The pattern of auto correlation and Partial autocorrelation will indicate a possible model.

ARMA model suggested, by a time series` autocorrelation and partial correlation.

Model order	Auto correlation	Partial autocorrelation	Comment
Autoregressive (P)	Tail off	Cut off after lag p	Alternating positive and negative, decaying to zero, use the partial auto correlation plot to identify the order.
Moving average (q)	Cut off after lag q	Tail off	One or more spikes, rest are essentially zero. MA order where plot become zero.
ARMA (p, q)	Tail off	Tail off	

Table 3-2 ARMA model suggested, by autocorrelation and partial correlation

3.3.2. **Estimation & Testing** (phase-ii) there is no simple formula which can be used to estimate the parameters. The process of estimation require an Iterative method & it is done using Statistical package programs. The method which is frequently used by the statistical package is of Maximum likely hood .The computer program for fitting the models will automatically find appropriate initial estimates of parameter and then refine them until the optimum value is obtained. The most common penalizing likelihood procedure is the Akaike's

information criteria (AIC). P values calculated using two sided Z-test from the normal probability table is used to test and asses the significance of each parameter separately (Makridakiset al 1998)

3.3.2.1 **Diagnostic** (phase ii) is a checking process; it is done by studying the ACF & PACF of residual to see if any pattern remains unaccounted for .For a good forecasting model, the residual left over after fitting the model be simply White noise. Portmanteau test can also be applied to the residuals as an additional test to fit.

3.3.3 **Forecasting** **(**phase iii) the final step of the box Jenkins approach is to forecast using the model Forecasting begins with the next period and then successive periods.

3.4 Application Software for Box-Jenkins Methods

Standard computer packages like SAS, SPSS, TRAMO-SEATS (TS), X-12-ARIMA & other statistical packages are available for Box - Jenkins method. The computer package used in this analysis is X-12-ARIMA. The X-12-ARIMA is the seasonal adjustment package. It has been one of the leading statistical packages available for seasonal adjustment methods for use in official statistics in many countries (United States, Canada, Europe). The method is used by most of the leading national statistical institutes, National Banks, academics & researchers across the world. X-12-ARIMA is developed by the United States (US) Bureau of the Census. The software is comprehensive, with many options available for tailoring seasonal adjustment to each individual series & it is made freely available by the US bureau of the census.

CHAPTER FOUR

4 Data presentation & Analysis

Data Source; Tourism modeling and forecasting research relies heavily on secondary data in terms of model construction and estimation (Song & Li). Accordingly this study has also used secondary data. The data source for this analysis is the Ministry of Culture& Tourism (MOCT); policy, planning, Evaluation & monitoring directorate publication, Tenth tourism statistics bulletin 2009-2012 (MOCT; 2013). The data used is Arrival of tourist at national border by month, from 2006 up to 2012.

4.1. Data presentation: the plot of the monthly tourist arrival (MTA) original series is presented here.

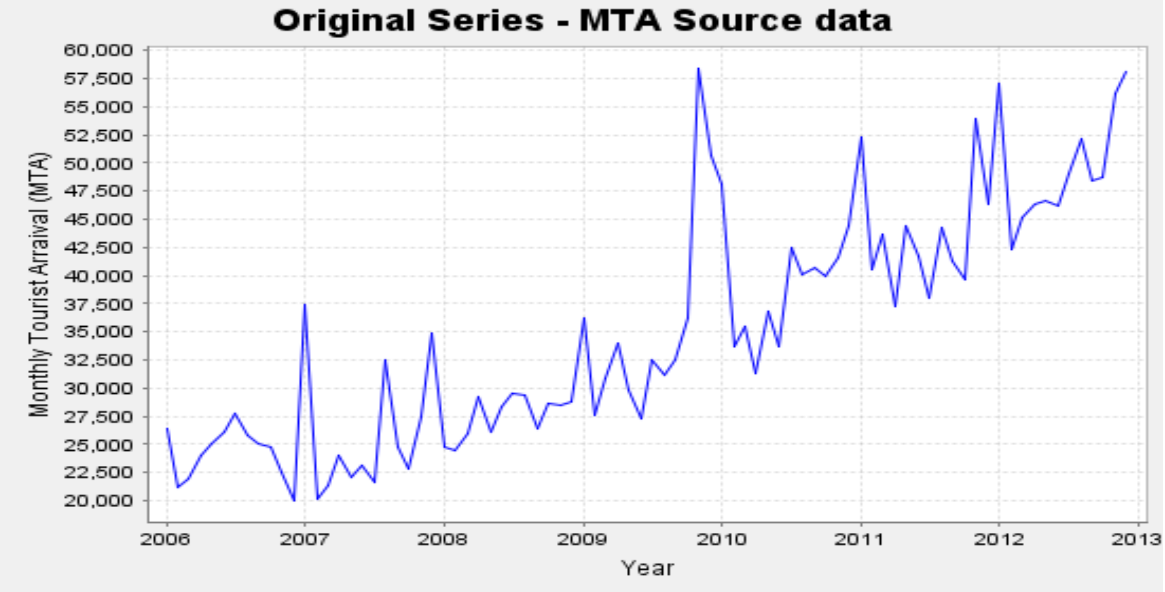


Fig 4-1: Original data series plot.

The source data shows variation in arrival from month to month, the annual arrival for 2006 was 290458 visitors .January registered26360, February shows reduced figure 21185, the data shows increased figure for July, 27770arrivals reduces to the minimum level of 19995 by

December. The annual arrival for 2007 was 311943; January shows 37460 arrivals, February shows reduced level of visitors 20206, the arrival picked to 32514 in the month of August, reduce to 24686 in September& further deepen to 22806 in October, arrival picks to 34892 in the month of December. The annual arrival for 2008 was 330157; the year shows relatively uniform distribution of arrival. January registered 24784, February didn't reduce much it registered 24498, maximum visitors are registered in July 29574, October, November& December registered relatively close visitors number 28687, 28453, 28769 respectively. The annual arrival for 2009 was 427286, January registered 36188, February drooped to 27529.June has registered the lowest arrival 27308, November registering the highest arrival ever 58 392, December registered less than November 50,725. The annual arrival for 2010 was 468305, January registered the highest arrival 48173, February and June registered the lowest arrival by registering 33701 & 33634 respectively. November, December registered 41549 & 44359. The annual arrival for 2011 was 523438, January registered the highest figure 52243, February shows low arrival 40567, April & July registered the lowest arrival 37315, 37992 respectively, November shows 41,549 & December registered 44,359.

The Annual arrival for 2012 was 596341. January registered 56984, February registered the lowest arrival for the year 42232.April, May, and June shows relatively similar level of arrival 46300, 46645, 46240 respectively. July, August & September has also registered relatively high visitor arrival 48990, 52211, 48211 respectively. The last quarter of the year October, November, December has registered 48794, 56227, and 58079 respectively. In general the annual arrival has shown increase trend from year to year. The visitor level has doubled within the period of six years (2006 to 2012).

The plot of the monthly tourist arrival (MTA) reveals important information about the data characteristics. There are periodic picks which are observed from time to time. The pick are observed at and around of the beginning of each year followed by low season, there is also a rise in pick before and after midyear periods in level although it is not as big as the beginning. This indicates that there are periods which has higher arrival rate than other periods with in the year, which gives indication for seasonal nature of the observation. The plot also shows a positively increasing behavior with time. Which, indicates the presence of linear trend component or increasing mean for the series. On the other hand, it is difficult to pin the observed characteristics of the amplitude of the variation. It is not that clear if the series has increasing seasonal amplitude or it is relatively constant one. What can be observed from the plot is the amplitude variation did not show consistent behavior .It more of erratic behavior, but maintain reasonable similar periodic repeating pattern with an increasing trending component.

4.2 Model Identification & selection: the first step in the analysis of box-Jenkins method is the use of the model identification procedure. The procedure involves the plotting of the initial data. Source data is run as the starting point in determining an appropriate model. The idea is that since the box-Jenkins procedure requires the data to be stationary. The input data must be adjusted to form a stationary series, one whose value vary more or less uniformly about the fixed level. But before directly going to this step one need to answer & confirm that, does the data require to be made stationary? This can be answered by analyzing the plot of the data .the ACF & PACF plot of the series can give indications whether it is necessary to difference or transform the data to make it stationary series. If the initial data series display neither trend nor

seasonality and residual plot shows values within the confidence interval .Then the process can be continued without any problem.

Sample Autocorrelations of the Series Differencing: none

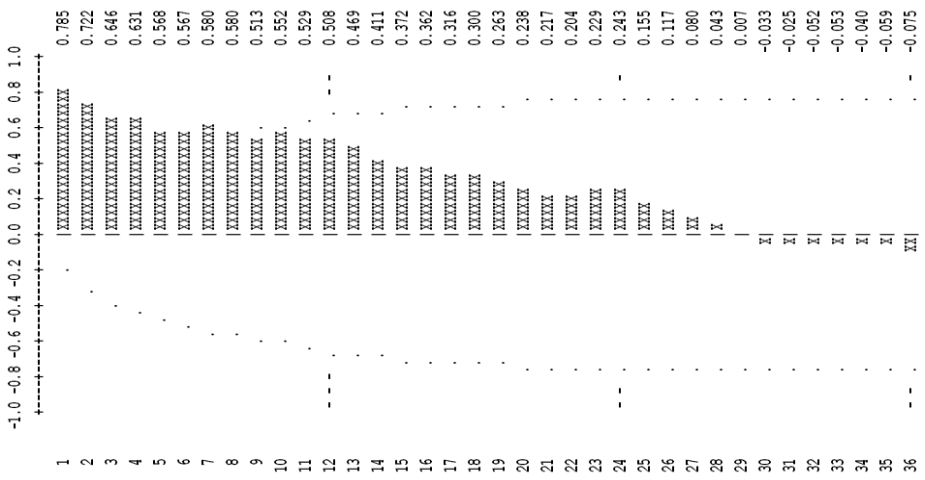


Fig 4-2; Sample auto correlation of the series: No Differencing

Sample Partial Autocorrelations of the Series Differencing: none

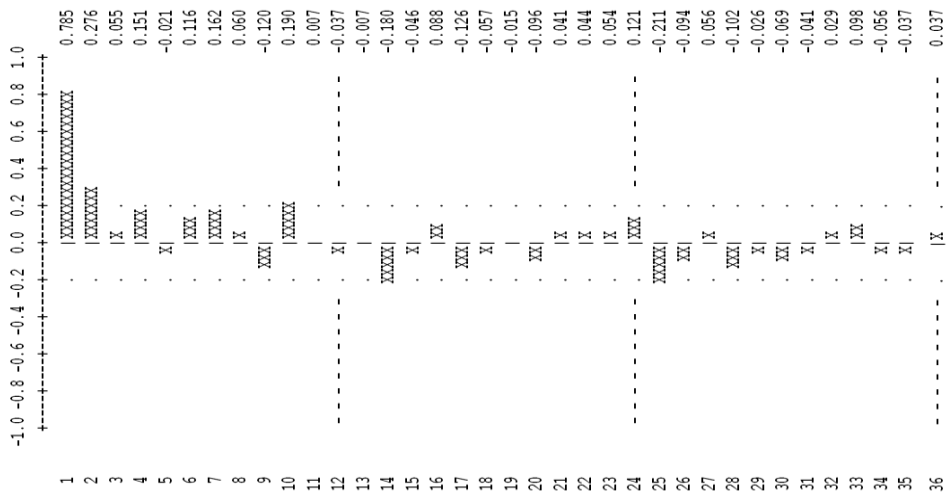


Fig 4-3; Sample partial Auto correlation of the series; No differencing

The ACF of the series shows a gradually decrease (decay) towards zero. The plots shows significance up to lag 8, Although it is not much pronounced (weaker signals) there is an

indication that the gradual decrease shows picks at seasonal lags around lag 12(lag 10, 11,12) & lag 24.

The PACF plot shows there is visible significance at lag 1 & 2 while the rest is within the range of boundary for white noise criteria or not significant from zero. The significance on lag one (1) and lag two (2) may suggest preferred model to be AR (2).

In over all the plot of the series has provided information about the series. The series has increasing trend, show fluctuation in periods within year which indicates seasonality, the ACF shows significance up to lag 8 & it attenuates gradually towards zero. Therefore it is possible to conclude that the series is not stationary & it needs to be differenced or/and transformed.

Determination of differencing / transformation: It is important to determine the type of differencing or transformation required to make the series stationary. However, In order to do that it is important to look into the results or the influence and effect of the differencing /transformation on the series.

Non seasonal differencing

Sample Autocorrelations of the Series. Differencing: Nonseasonal Order=1

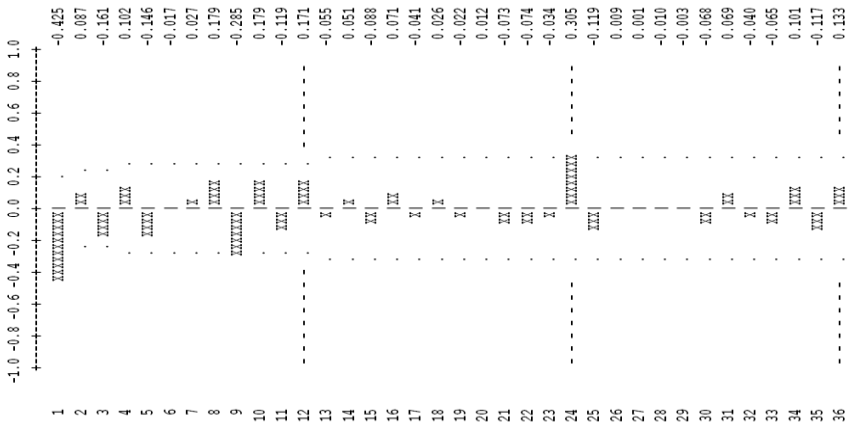


Fig 4-4: Sample Auto correlation of the series; Non seasonal order=1

Sample Partial Autocorrelations of the Series. Differencing: Nonseasonal Order=1

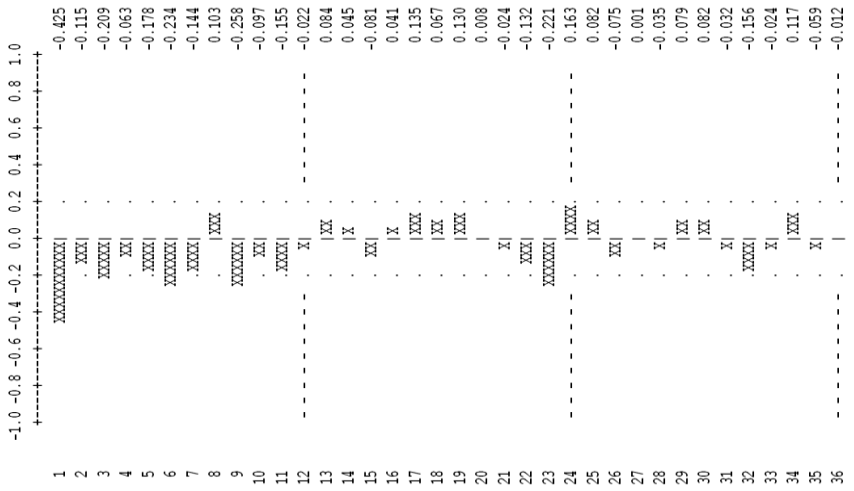


FIG 4-5; Sample partial auto correlation of the series; Differencing Non seasonal order=1

Non seasonal differencing of the series has resulted, a series which varies from fixed mean (Horizontal) however the plot shows ACF significance at lag 1, 9 & 24. The PACF shows significance at lag 1,3,6,9 & 23.

SampleAutocorrelations of the series

Differencing: Seasonal Order=1

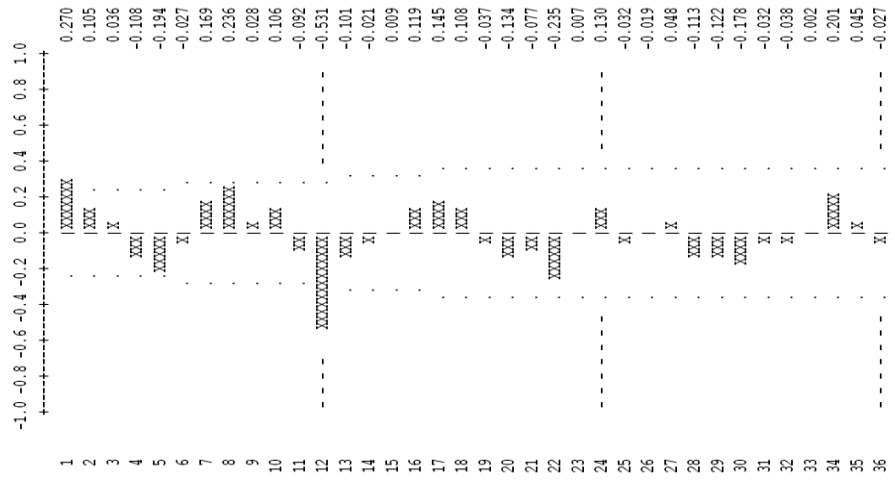


Fig 4-6: Sample auto correlation of the series: Differencing Seasonal order=1

Sample Partial Autocorrelations of the series Differencing: Seasonal Order=1

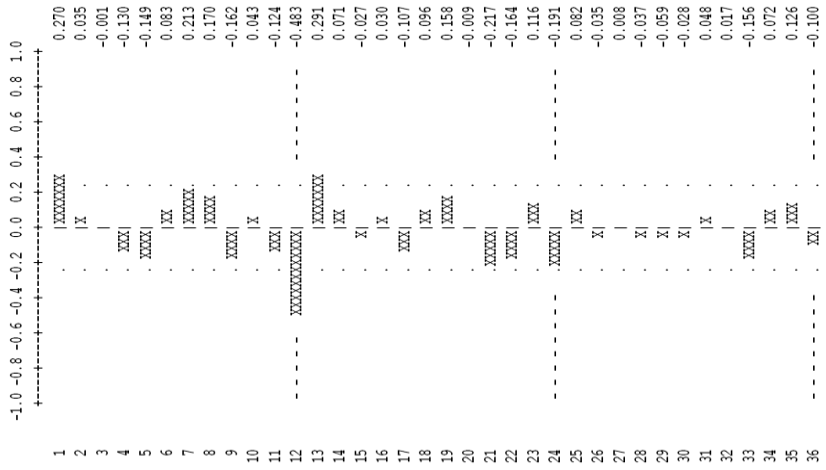


Fig 4-7 Sample partial autocorrelation of the series: differencing seasonal order =1

Seasonal differencing of the series has resulted in much improved result, The ACF plot Shows significance at lag 1 & 12, the rest of the plots are within the limit of confidence interval. The PACF plot shows significance at lag 1, 12, & 13. The limited no of significant lags shows the importance of seasonal differencing to make the series stationary.

Combined; Non seasonal & seasonal differencing of the series

Sample Autocorrelations of the Residuals Differencing: Seasonal Order=1Nonseasonal Order=1

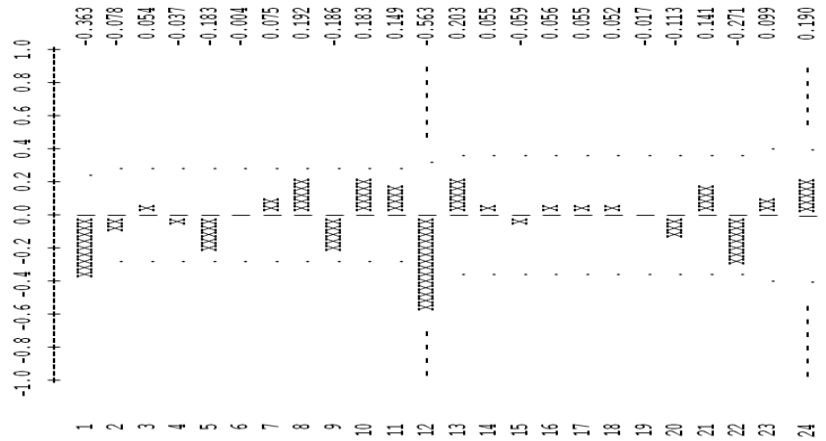


Fig 4-8: Sample autocorrelation of residual

Differencing : Seasonal order =1; Non seasonal order=1

Sample Partial Autocorrelations of the Residuals Differencing: Seasonal Order=1Nonseasonal Order=1

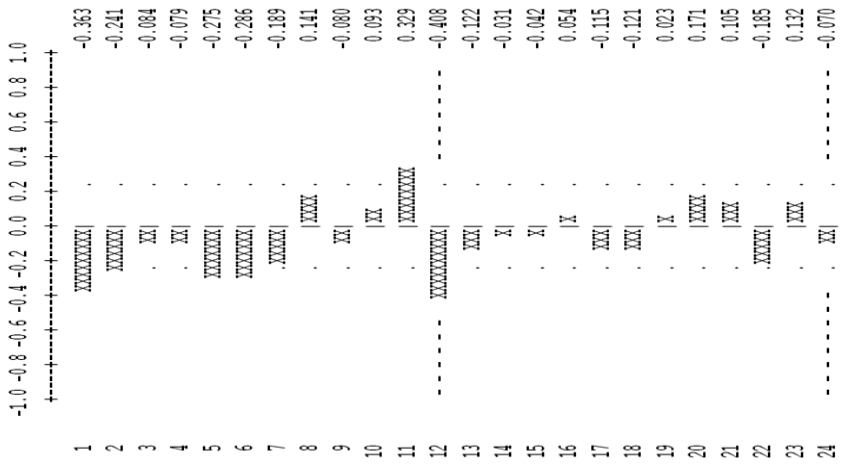


Fig 4-9: Sample Partial Auto correlation of the residual. Differencing; Seasonal order=1;

Non seasonal order=1

The ACF plot of for the non seasonal & seasonal differenced series shows significance at lag 1 & 12.On the other hand the PACF plot shows significance on lag 1,2,5,6,11 & 12,while the rest of the lags shows plot of within the boundary of confidence interval . All the partial auto correlation significant lags are less than lag 12.

"TEST FOR TRANSFORMATION"

Sample Autocorrelations of the Residuals

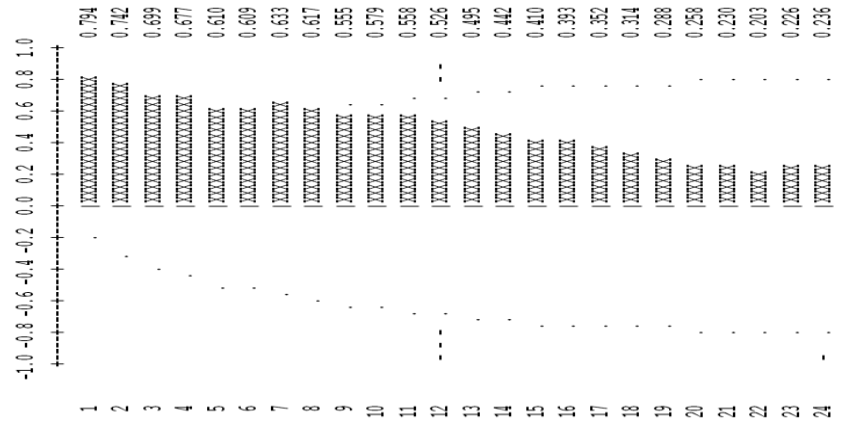


FIG 4-10: Test for transformation; sample auto correlation of residual

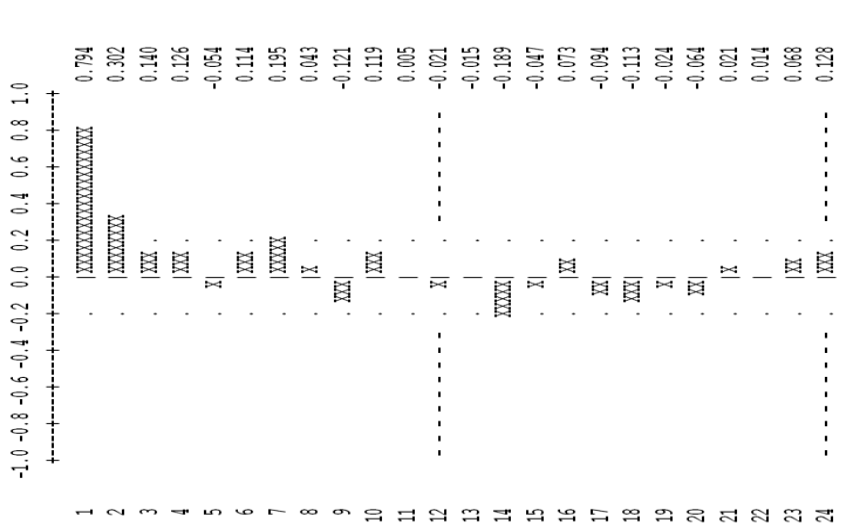


Fig 4-11; Test for transformation, Sample Partial Auto correlation of residual

The log transformation test for original series; although there is minor difference in terms of value the plot show similar pattern of ACF pattern a with the original series without differencing or log transformation .The plot shows slowly decreasing residual plot, it has Significant residual up to lag 8 . After lag 8, it decays towards not being significant or not different from zero. The PACF plot shows significance for lag 1, 2,lag 7 & 14 shows almost at the boundary of being significant, the rest is within the range of limit of white noise criteria or not different from zero. Comparing the plot of log transformed series with the non transformed, not differenced source data (MTA) series did not show the contribution of log transformation in affecting the series towards stationarity. There for this may gives clue that log transforming the series might not assist in making the MTA series stationary.

Effect of the Combining Log transformation & Differencing

Sample Autocorrelations of the Series (Transformed)

Differencing: Nonseasonal Order=1, Seasonal Order=1

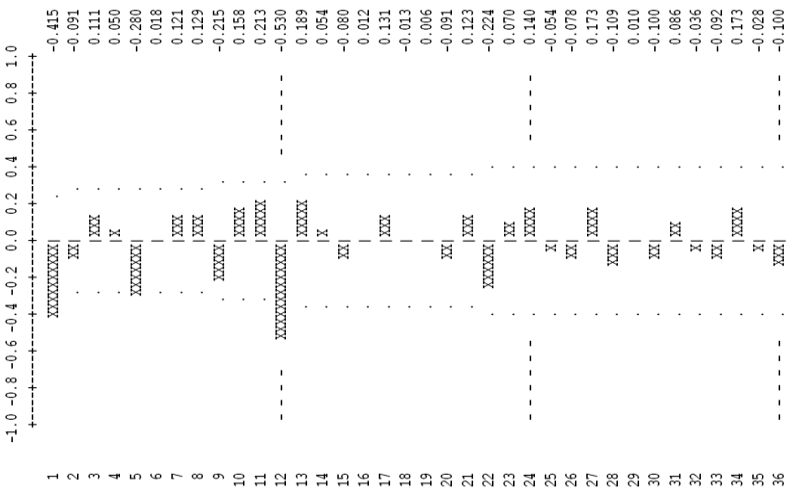


FIG 4-12;combined log transformation & differencing;

Sample auto correlation of the series (Transformed)Differenced; Non seasonal=1: Seasonal=1

Sample Partial Autocorrelations of the Series (Transformed)

Differencing: Nonseasonal Order=1, Seasonal Order=1

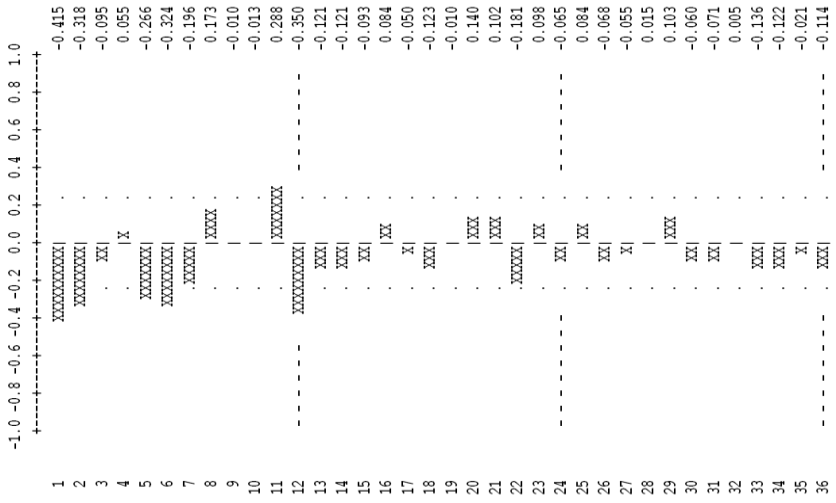


Fig 4-13 Sample partial Auto correlation of series (Transformed)

Differencing; Non seasonal order=1; Seasonal order =1

The plot has similarity with the differenced series, but did show major departure from log transformed series. The ACF has significance at lag 1,5,12. The rest of the lags fail is within the limit of confidence interval for white noise. On the other hand PACF plot shows significance at lag 1, 2, 5, 6, 11 & 12.while the rest of the residual plot is within the range of confidence interval.

Comparing the combined (log transformed & differenced) series with the only differenced series could give us the contribution of the log transformation. While the differenced ACF plot shows only significance at two lags (lag 1,12),the combination (log transformed & differenced) create three significant plots at lag 1,5 & 12.the PACF plots shows similar significance in both cases ,there for the log transformation contribution to change the series towards stationary is minimal. There for it is not considered necessary.

Models Selection; Model selection process starts with taking advantage of auto selection feature of X-12-ARIMA ; The program is allowed to run on Auto mode; it uses the log transformation and select ARIMA (311) (011) . The plot for (311) (011) shows significance ACF at lag 4,5 & 8,PACF shows significance at 4,5&12.All the p values show value less than .05,which indicates the poor fit of the model to the data, there for the selected model cannot be considered.

From the pattern of behavioral investigation of the series for stationarity, it has been observed that contribution of the log transformation to make the series stationary is not that visible while the seasonal differencing is critical. On the other hand the auto model selection uses log transformation. In order to recheck the auto model selection option the series is run by removing the log transformation effect. That is auto model selection using differencing only.

However, results show the model selected is the same model (311) (011). It also shows similar p values which is less than 0.05 therefore, it cannot be consider as a good fit model. This prompts to check manual model selection procedure.

In order to choose the most appropriate model, Manual selection process is used to generate additional model option which will be compared with each other to find the best model to be used for forecasting. The manual selection process followed structured system of investigation based on the principle of parsimony. Each model is checked for meeting diagnostic requirement. The models considered are based upon the observation of the series characteristics which exhibits strong seasonal component (011) from the earlier test.

MODEL 1 - SARIMA (110) $(011)_{12}$

The result for model (110) (011) shows no significance ACF, however it diagnostic show LBQ fail at lag 2; significance LBQ 3-4, significance BPQ=3-4; Significant PACF 2. AIC =1392.3906; AICC=1393.7031; P Value <.05 OR 5% AT LAG 1 & LAG 2, as the result, the model is Rejected based up on diagnostic result.

MODEL 2 - SARIMA (211) $(011)_{12}$

The plot of the series show no significant ACF & PACF. All p values are greater than .05 or 5%; AIC Value =1385.8193; AICC Value =1388.1419; Model qualified for consideration

Model 3 - SARIMA (111) $(011)_{12}$

The plot of the series show no significant ACF & PACF. All p values are greater than .05 or 5%.; AIC Value =1383.8612; AICC Value =1385.6389; Model is qualified for consideration.

Model 4- SARIMA (011) $(011)_{12}$

The plot of the series show no significant ACF & PACF. All p value are greater than .05 or 5%; AIC VALUE =1381.9061; AICC VALUE =1383.2186; Model is qualified for consideration

MODEL 5 -SARIMA (210) $(011)_{12}$

Diagnostic show LBQ & BPQ FAIL at lag 4; P value at lag 4 =.041 which is less than .05 or 5%; AIC VALUE =1387.3385; AICC Value =1389.1162; Model rejected based on diagnostic result.

Model 6- SARIMA (312) $(011)_{12}$

The plot of the series show no significant ACF & PACF. All p values are greater than .05 or 5%; AIC Value =1385.8193; AICC Value =1388.1419; AAFCE (3yr) = 6.648; Model is qualified for consideration.

Model 7 -SARIMA (212) $(011)_{12}$

The plot of the series show no significant ACF & PACF, All p values are greater than .05 or 5%.for all df>0

AIC Value =1387.3709; AICC value =1390.3217: Model is qualified for consideration.

MODEL 8 -SARIMA (112) $(011)_{12}$

The plot shows no significant ACF but it has Significant PACF at lag 5, diagnostic show 2 LBQ fail at lag 5 & 6 Significant BPQ =1 at lag 5; P value at lag 5=.015; p values at lag 6=.046 which are less than the threshold value of .05 or 5%, AIC Value =1395.0968; AICC Value =1396.8746; Model is rejected based on diagnostic result

Model 9-SARIMA (012) $(011)_{12}$

The plot of the series show no significant ACF & PACF ,All p values are greater than .05 or 5%; AIC Value =1383.8648; AICC Value = 1385.6425 Model is qualified for consideration.

The list of qualified models for consideration are; (211) (011); (111) (011); (011) (011); (312)(011); (212)(011); (012)(011).

No.	Model of forecasting (X-12-ARIMA)	AIC	AICC	Average absolute percentage % Error (AAPE, last 3 years)
1	(211) (011)	1385.8193	1388.1419	6.56
2	(111) (011)	1383.8612	1385.6389	6.52
3	(011) (011)	1381.9061	1383.2186	6.02
4	(312) (011)	1389.3701	1393.0368	6.64
5	(212) (011)	1387.3709	1390.3217	6.58
6	(012) (011)	1383.8648	1385.6425	5.98

Table 4-1 Qualified ARIMA Models

From the tabulation of the selection parameters, there are competing models which can satisfy the combined parameters (lowest AIC & AAPE).However, the model which full fill, the selection criteria with the lowest AIC value of 1381.9061 among qualified models is (011) (011) it has the lowest AIC; AICC value but has slightly higher AAPE which is 6.02. Model (012) (011) has the lowest AAPE for the last 3 years (5.98) but it`s AIC is 1383.8646 which is higher than model (011) (011). However, the difference in AAPE between the model (011) (011) & (012) (011) are not that significant. It only shows marginal difference of 0.04, which gives a winning edge for model (011) (011). The rest of the models (211) (011); (111) (011); (312) (011) ;(212)(011) have higher AIC value than the main front runners models, there for they are dropped. As the result model (011) (011) is selected to be used as model for the MTA series. For this reason it is decided to be used in the forecasting process.

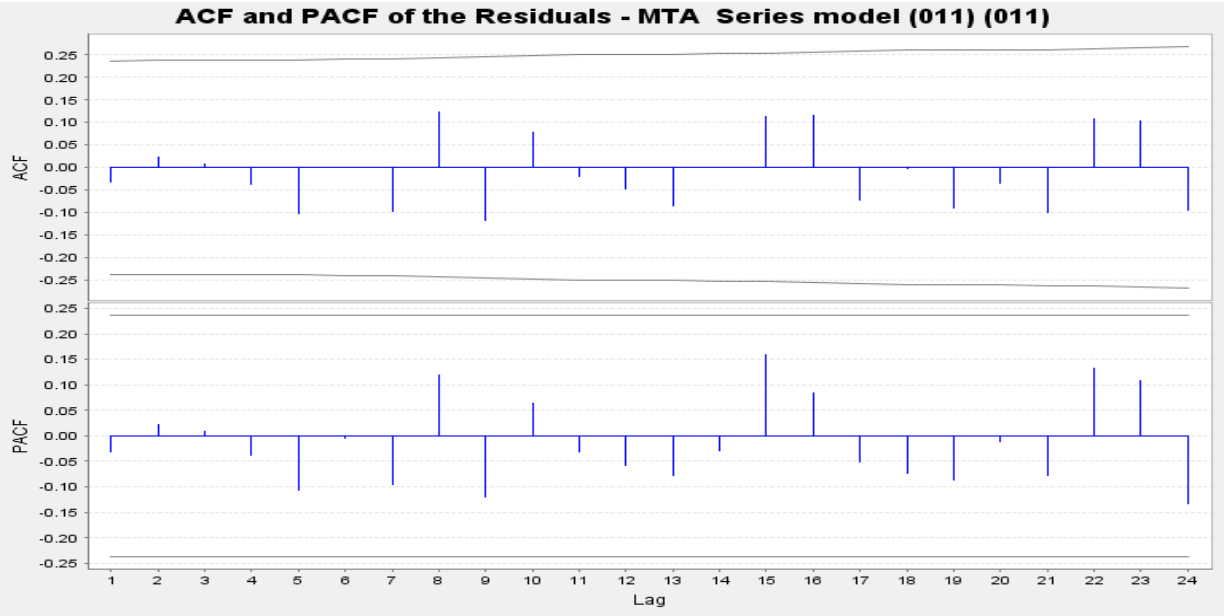


Fig 4-14: ACF& PACF Of the residual; Model (011) $(011)_{12}$

4.3 Analysis

4.3.1 Output Report; the output of the program using the selected model has produced many table. In fact the X-12-ARIMA program has extensive list of output, it is not practical to address all the report & it wouldn't be appropriate to attempt it in the context of the main objective of this paper. However, it is important to list some the components of the output report, just to high light the report types generated ; A1 time series data; model estimation evaluation report, Diagnostic report ,B1 original series prior adjusted for reg-arima factor,B1A forecast of prior adjusted table,D11 seasonality adjusted,D12 trend cycle are among the table generated. In this case selected output tables are presented for discussion.

Presenting forecasted series; the selected model $(011)(011)_{12}$ is used to generate the forecasts which are more distance periods by forecasting series of period –ahead forecasts and re plugging them in for the unknown future values. The method has created a way to extend the forecast for distance period which has presented opportunity to extend & cover up to year

twenty twenty-five (2025), This has created possibility to get the long term forecast of the monthly tourist arrival (MTA).On the other hand, the Quarterly tourist arrival (QTA) or the quarterly series which has been made available by following similar rigorous procedure as MTA has been followed & presented to compliment MTA. The model used for QTA is (2 1 0) $(0\ 1\ 1)_{12}$. However, it is important to note that there is a challenge in quarterly forecast when it comes to extending the forecast period beyond 2020.

In general, it is also important to provide the word of caution that when one uses long term forecast. The model cannot be used by extending it indefinitely. One of the main issues is that the model might not meet diagnostic requirement & even a new model might not succeed in fitting the data properly (experience of the quarterly series shows that) .On the other hand when one want to explore the distance future there is no guaranty that conditions remain the same, there is always a possibility that exogenous factors can change & influence the dependent parameter.

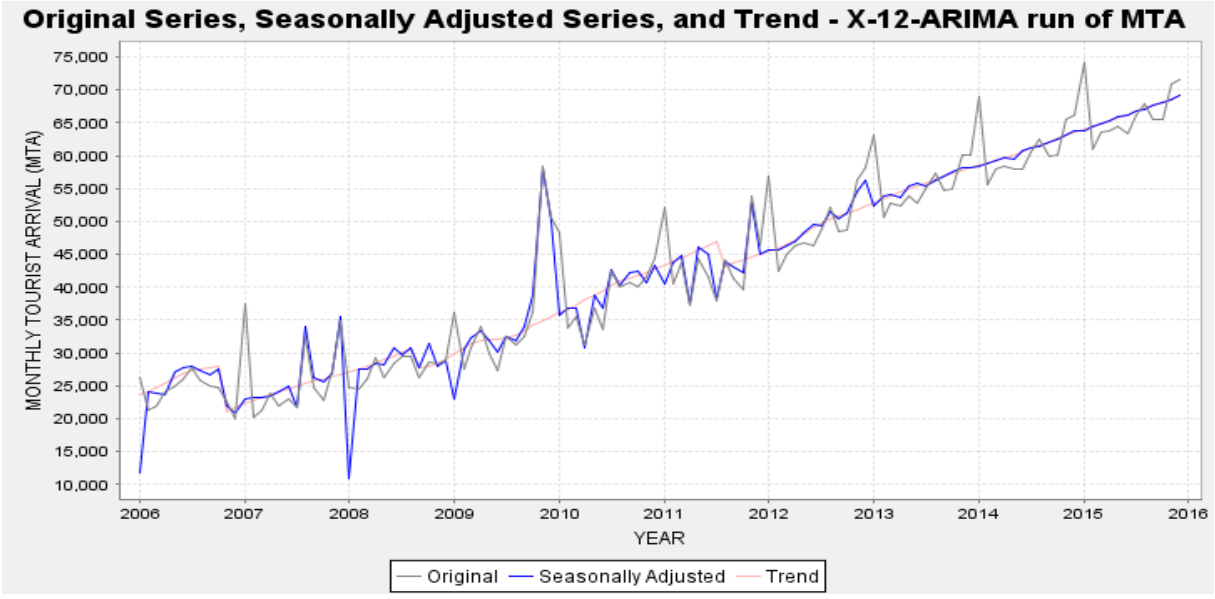


Fig 4-15: X-12-ARIMA Run of MTA source data

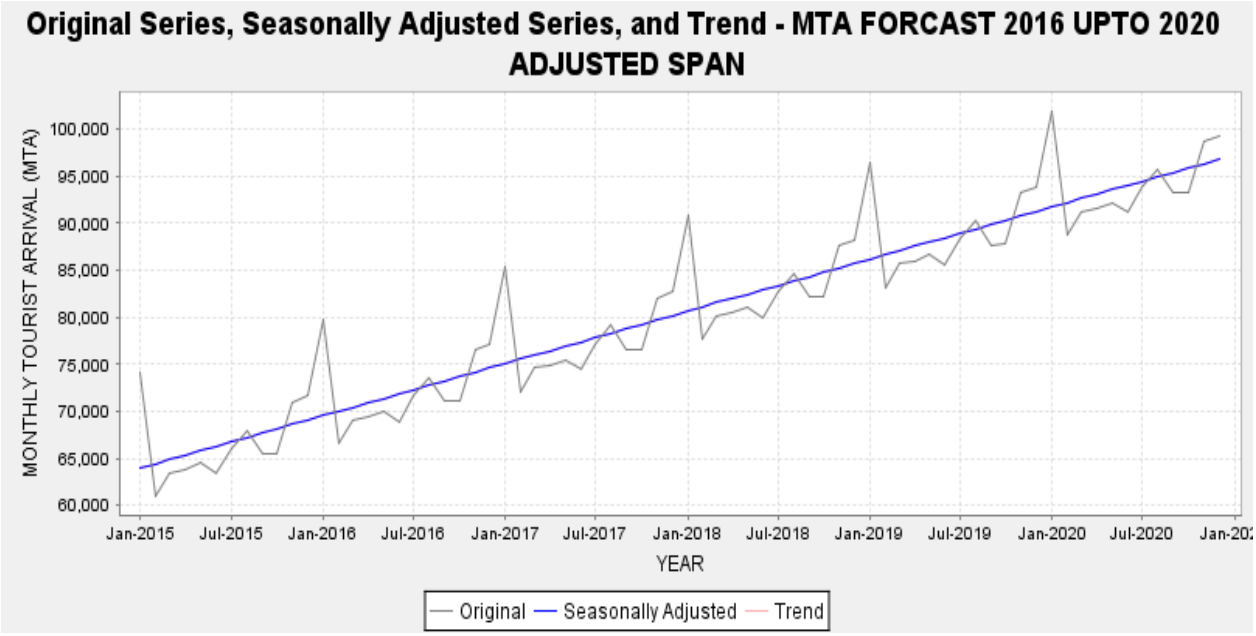


Fig 4-16: MTA Forecast of 2016 up to 2020

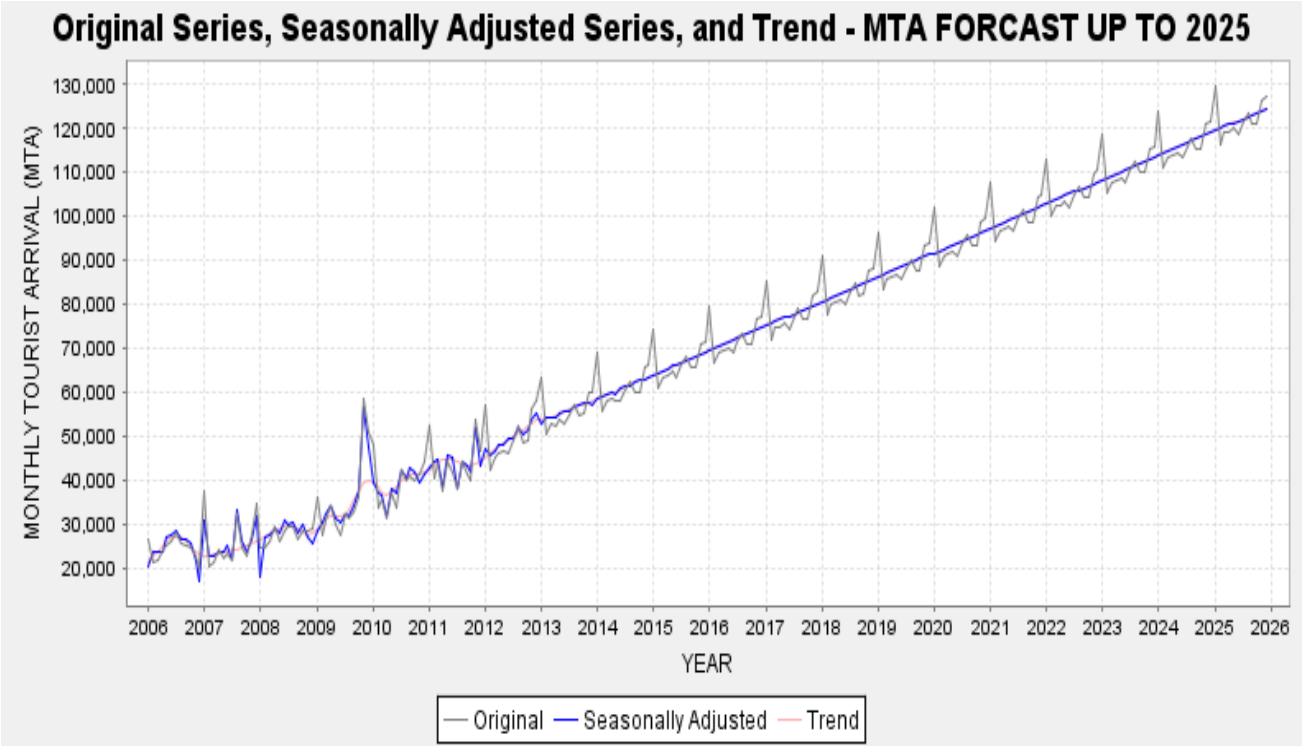


Fig 4-17: MTA Forecast up to 2025

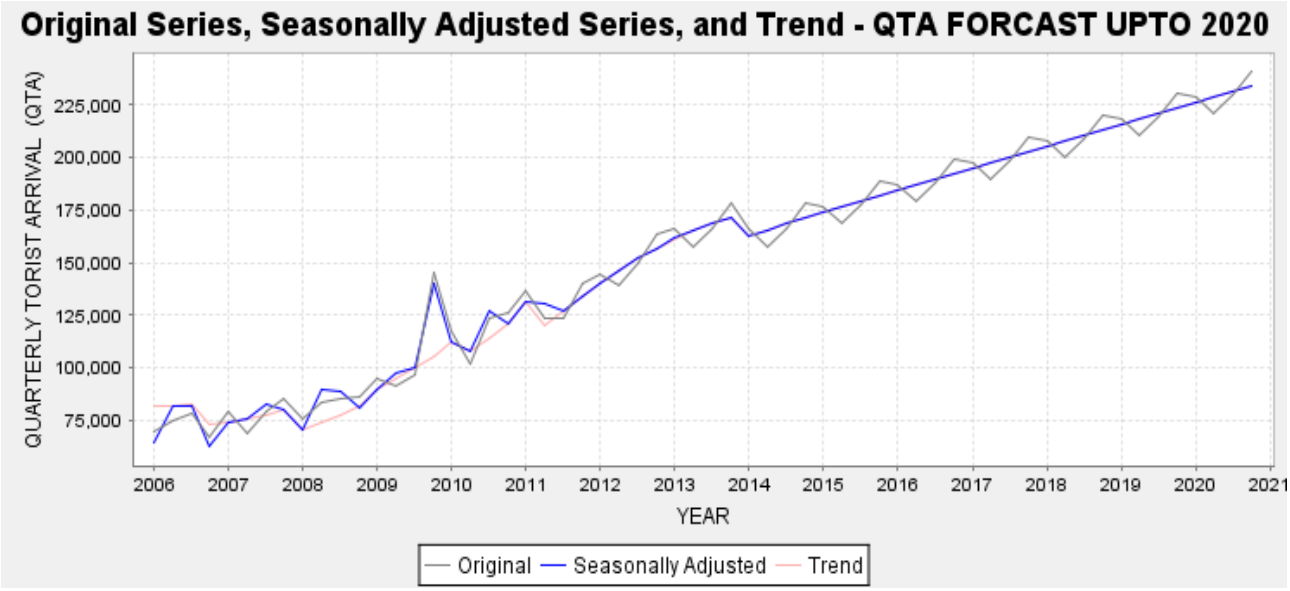


Fig 4-18 QTA Forecast up to 2020

4.3.2. Interpretation of Output (Analysis)

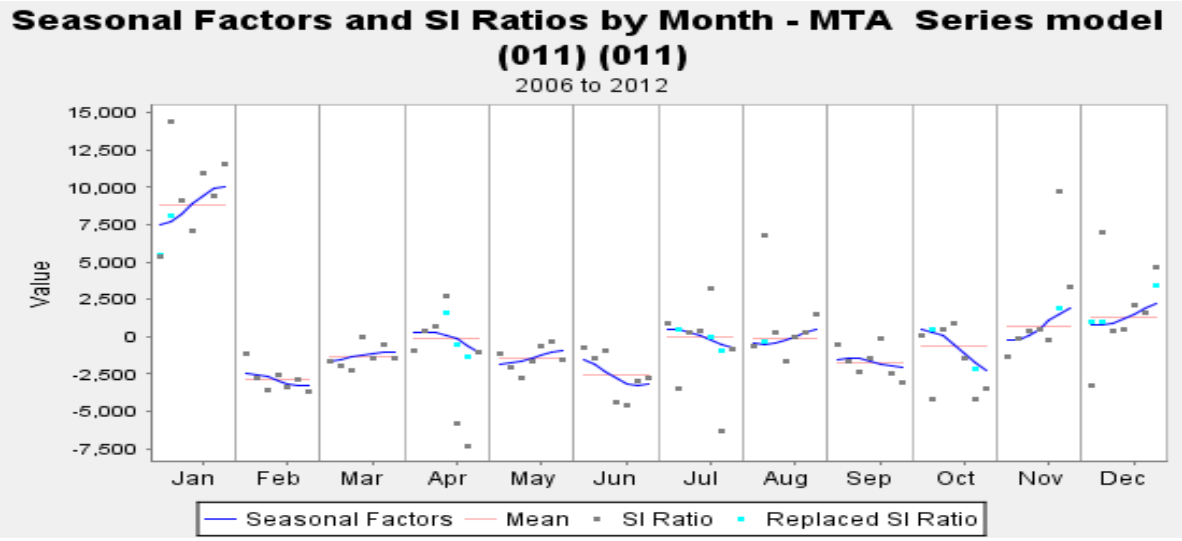
Original series: the original series of the output shows the typical randomness of the arrival pattern up to end of the actual observed data (2006- 2013). The plots, exhibits similar repeating pattern (model representation of the data pattern), as of 2013 which is starting point of forecasting period which extends up to end of forecasting period 2025. The repeating pattern is clearly indicated on adjusted span plot.

Seasonally Adjusted series: the aim of preparing seasonally adjusted series is to adjust or corrects the seasonal effect which masks the underlying trend of the series. The correction is intended to reduce the variability induced by seasonal component of the data, there for it natural to exhibits charter of following of the original series with more smother or subdued variation. The plot also shows this fact as well as showing the randomness which follow the original series. Though it miss certain points of picks and through. Otherwise it follows the original series well. In the forecasted period as of 2013 the seasonally adjusted series shows

more smoothed line or linear characteristics this, is because the model representation for the original series has less randomness or variability in this period.

Trend: the trend plot of the series exhibits more smoothed linear pattern; this is the characteristics of the underlying growth pattern trend of the series with time. The pattern shows abrupt level change or shift in level in mid-year of 2011. (The change is also observed in the original as well as on the seasonally adjusted series). The trend line coincides with the seasonally adjusted series in the forecasted period up to end of 2025.

4.3.3. <u>Seasonality Analysis;</u> Seasonality is a notable characteristic of tourism demand and cannot be ignored in the modeling process when monthly or quarterly data are used (song &Li). Accordingly Seasonality has been observed on the modeling of the monthly tourist arrival (MTA). In his case, although the seasonality is there its manifestation is not that strong. The non-parametric test of the model show, the presence of seasonality at 1% level & moving seasonality is presented at five 5% level.



D-10 plot of the output result. (Seasonal factor)

Fig 4-19: Seasonal Factors & SI Ratio: MTA series model $(011)\ (011)_{12}$

The seasonal factor plot shows positive trend on November, December & January, where January exhibits the pick of the season by factor of 8836. On the other hand February exhibits The opposite or trough with factor of -2898, March & April shows recovery from February, Exhibits -1297 & -113 factors, whereas month of May & June shows factor of -1434 & -2593 respectively. June exhibits the second lowest factor. However, the deep is not as big as February, April exhibits identifiable recovery. Again July and august exhibits identifiable positive recovery which is -21 &- 136 ; whereas September & October exhibits low factor, with -1702 &-677 Which shows reduction from arrival level of July. It could probably be related to low period of movement (spring) in tourist generating countries. The pick in January could probably attributed to increase in visitor interest to experience the Ethiopian orthodox church calibrations of Christmas at Lalibela & Timeket (Epiphany) in Gonder, the survey result published by MOCT;2013 support this argument as it shows 42.89% of visitors are coming to experiencing the cultural attractions, where as 27.73 % of visitors are interested in historical attractions .The relative better visitors level in November & December could be attributed to the convenient weather factor in the country . However, despite the same convenient weather factor the trough In February is something which requires being look at. Despite Ethiopia's rainy season, the relative arrival increase in July & August could probably be attributed to TOURIST season (summer vacation) period in tourist generating countries (Europe & USA). The same pattern of the monthly variation in arrival (seasonality) is observed in the forecasted period ,however the value has changed to increased level for example the January has more positive pickups & whereas February shows relative reduction in the level of the through.

4.3.4. Trend Analysis

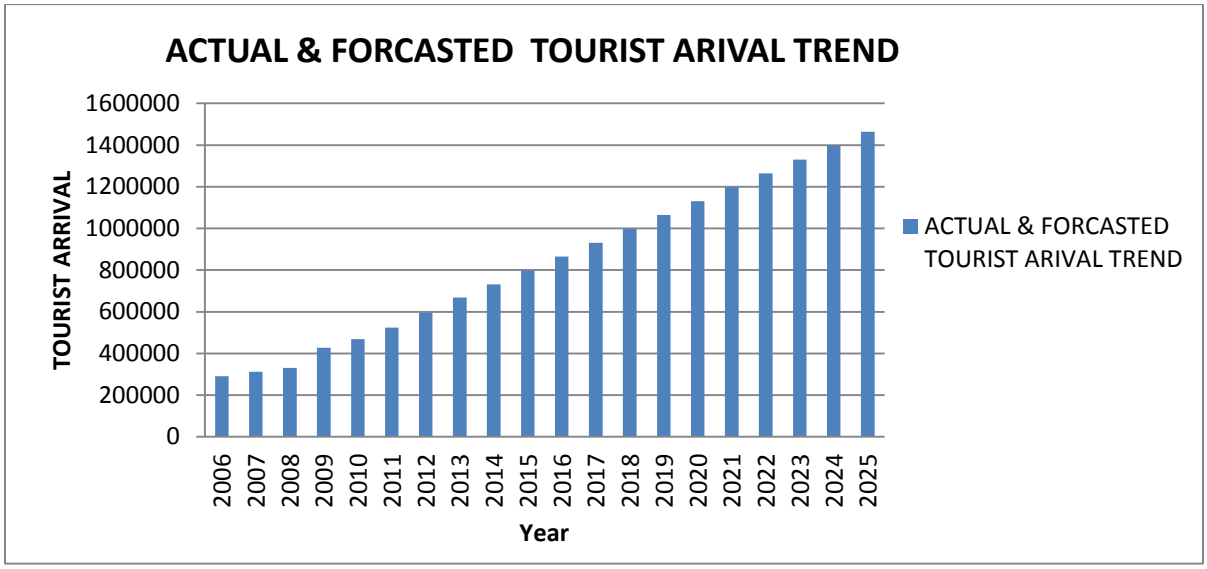


FIG 4-20: Actual & Forecasted tourist arrival trend

The trend analysis shows that the annual average growth between 2006 to 2025 is 9%. whereas the annual growth between the actual observation period of 2006 to 2012 was 13%.The biggest annual increment or growth in arrival is observed between 2008 and 2009 which was 29.42%. whereas the minimum growth is observed at the end of forecast period with 4.76% annual growth rate. The annual growth trend shows gradual decrease when the forecast period goes further and further out. The decline in growth rate starts at the end of actual observation period 2012 /2011 which was having annual increment of 13.92%.the growth gradually decrease to annual increments of 4.76% at the end of forecast period 2025. On the other hand the monthly mean of arrival for coming next ten year forecast period comes to 97021, the minimum monthly arrival is 69590 which mostly happen in the month of February, whereas the maximum monthly arrival comes 124520 which happened in the month January. The standard deviation comes to 16009.

4.4. Scenario planning & Intervention

4.4.1. Intervention; When time series data is impacted by extreme change, (the change could be positive or negative, it could came from external or internal factors) it affects the mean of the series. Such change is called change due to intervention effect. It is also called structural change or regime change (Z ismail; 2009). Change from external factor could be manmade or natural, for example External factor could be from weather factor or volcano , earth quake ,Tsunami, disease (Sars, Foot & mouth, Ebola) or manmade intervention like embargo, political / policy change, terrorism or could be an economic factor (effect of Economic recession , increase in economic growth / disposable income) or intervention like policy impact & increased promotion of destination.

The general procedure for intervention analysis is mostly post impact analysis, which divided the period before the intervention & after the intervention and try to find out the proper model, the level of impact & its related parameters, where as in this case what is attempted is to predict the impact of the intervention before it happens, this is done to see the case of considering different scenario. Therefore it makes it unnecessary to go into the details of analysis involved in getting different parameters of it. However, it is important to high light that the effect of intervention considered is the stepped function which causes permanent level change.[54]The impact is expected to manifest within year period in this case in year 2016.The model used is the same model before & after the impact.

4.4.2. Scenario planning; are an attempt to visualize a number of possible futures and consider their implications, a major purpose of scenarios is to challenge conventional thinking and avoid extrapolating into the future in a linear fashion.(Makridakis; 1998). It works by constructing

alternative possible futures, or scenarios. Accordingly, scenario planning coupled with time series intervention effect is used to generate the possible different alternatives scenarios of long term forecasting of tourist arrivals as it is indicated as follows. This part of the process complement the quantitative analysis with the judgmental (qualitative aspect) to generate alternative option.

Back ground, impact of exogenous factor in 2014 tourist arrival its effect on east & south African countries Kenya , Tanzania & South Africa is taken as an example for possible exogenous factor impact on tourist arrival which could affect at any time when one deals with long term forecast of tourist arrival. The official release from these countries, tourism biros, hotel chains, tour & travel companies has shown that the Ebola pandemic in west Africa has affected there tourist arrival heavily ,in case of Kenya this is more aggravated by security concern from Somalia extremist group special in tourist destination like Mombasa. For example, Hotel association of Tanzania representing 195 nationwide sites said business is down 30 to 40 percent on the year and advanced booking, mostly for 2015 are 50 % lower. Kenya`s Serina hotels, which is a high end safari lodges and beach resort announced booking is down as much as 30% in 2014 (leisure tourism ,October 30,2014);Netherland based safari booking has conducted survey on more than five hundred operators announced booking is down by 20 to70 %. South African tour operators & tourism officials have also confirmed the drop on their booking especially from Asian travelers. The World Bank also cut forecast of economic growth for sub Saharan Africa from 5.2 to 4.6 % (leisure tourism October 2014). Considering the implication of such external factors & the sensitivity of the tourism industry. The reduction of 15% of from normal trend forecast is taken as the case for worst case scenario .on the same

premises a positive impact of 15 % increase in tourist arrival is also assumed considering, the Ethiopian government intention to prop up support for the industry for the coming years.

Scenario one (1) 15 % positive intervention (increase in tourist arrival is expected as of 2016 this is assumed based on Ethiopian government identification of tourism sector as priority & establish tourism new office called "Ethiopian tourism organization" in which sole purpose is promoting & facilitating the development of the sector. The impact of this new establishment is expected to increase tourist flow to the country.

Scenario two (2) 15% reduction or negative intervention scenario (in this case reduction in tourist arrival is assumed). It considered the worst case possibility. As it is indicated earlier, it tries to learn from influence of exogenous factor which can impact the tourist flow one way or the other .here the prevailing condition observed in east & southern Africa tourist flow reduction as the result of West Africa health scare in 2014 is taken as learning point. Other than health scare issue, a typical scenario of negative intervention (impact) can come from terrorism, economic recession, negative publicity like hunger (famine) and other factors.

Scenario three (3); this scenario is considering stretched goal. Ethiopian government GTP plan has been aimed to reach more than a million tourist arrivals by 2015.however, the current trend show it is highly unlikely that the target will be meet. The forecast of this analysis also show that with the current trend it will be challenging to meet the target without major intervention even in the upcoming years. Therefore this is stretched case scenario which consider or takes the current trend forecasted figure for 2025 to be taken as the target to be achieved by 2020. Similar strategic goals are observed in EAST African countries (Kenya,

Tanzania, Uganda, and Rwanda) tourism plans. This shows it is possible to consider to achieve such number of arrival within the set time frame.

Scenario four (4); the fourth scenario is taken as the forecast of the current trend.

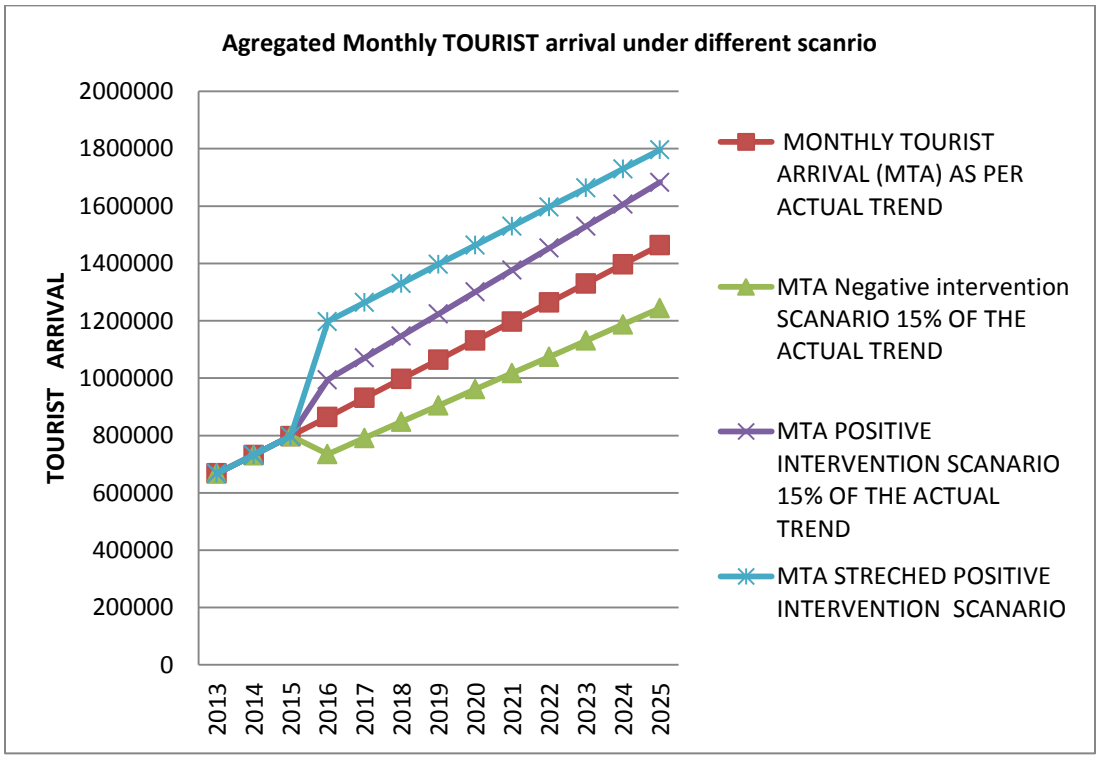


Fig 4-21: Aggregated Monthly tourist arrival under different case scenario

4.5. Supply & Demand Gap Analysis

The methodology used to reach supply & demand gap is funneling technique, it basically work by decomposing or breaking down the bulk arrival figure in to its different element. It starts with the lump sum arrival figures , identify the city component from the overall arrival, it further looks & eliminates the family & friend visitors element from the city visitors, as this category of visitors are mostly visitors who have family & friends, they are not likely to look for accommodation facility in the city hotel establishments. However, some component of this category of visitors is considered to use the accommodation facility. This provides the number

of arrival visitors who are looking for accommodation facilities. The final filtering comes in identifying the actual room counts required on daily bases this requires considering the possible double occupancy factor.

4.5.1. Funneling Technique

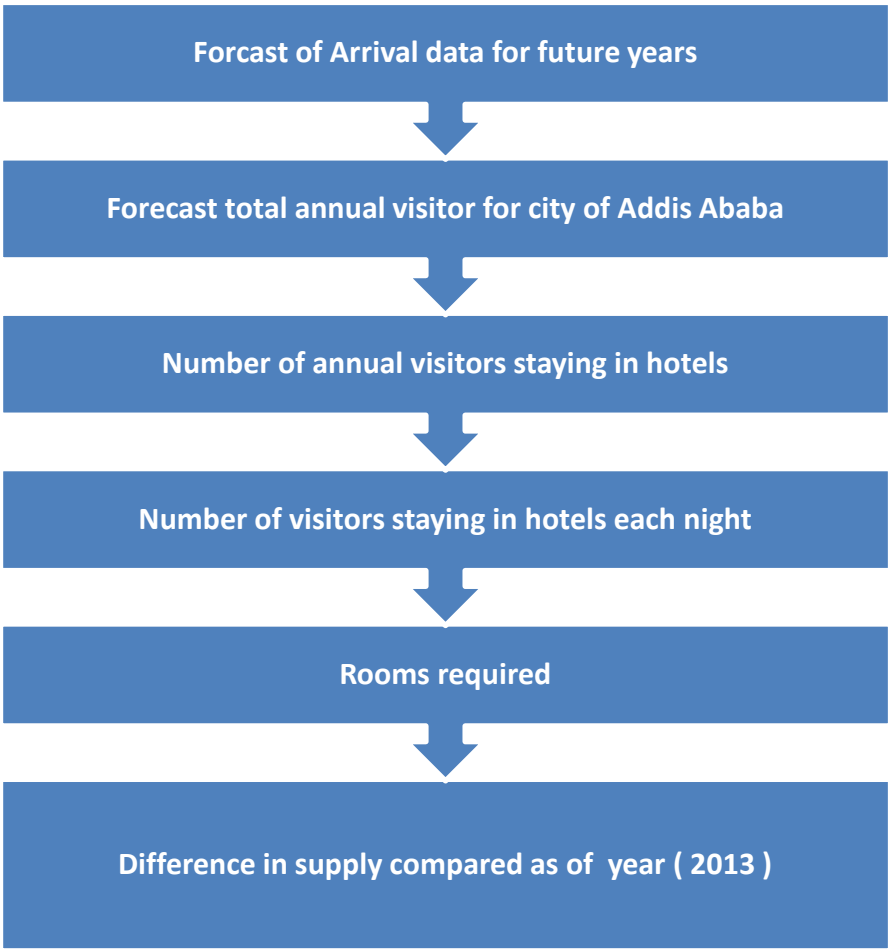


Fig 4-22: Funneling technique

No.	Factors considered	Factor used	Bases
1	Arrival to the city of Addis Ababa is considered as percentage of overall arrival to the country.	86%	Ministry of Culture &tourism (MOCT) Tourism statistics bulletin (2009-2012) Indicated 86% of arrival use Addis Ababa airport as a point of entry the balance use land transportation (border town point of entry).
2	Reduction due to visiting family & friends, This group of visitors are mostly considered to stay with family & friends.	7%	Ministry of culture & tourism statistics bulletin (2009-2012) indicates 10% of arrival to the country is in this visitor's category. However certain percentage of this group is considered to use accommodations facility. This percentage is considered as three (3%).
3	Double occupancy factor	1.1	Experience in five star hotel environment in Addis Ababa shows this factor

Table 4-2 Factors used on funneling technique

The process enables to convert total forecasted of annual tourist arrival to the country to visitors who will stay & looking for accommodation facility in the city. It becomes the bases of the demand for hotel or accommodation rooms for the city of Addis Ababa.

4.5.2. Room Demand

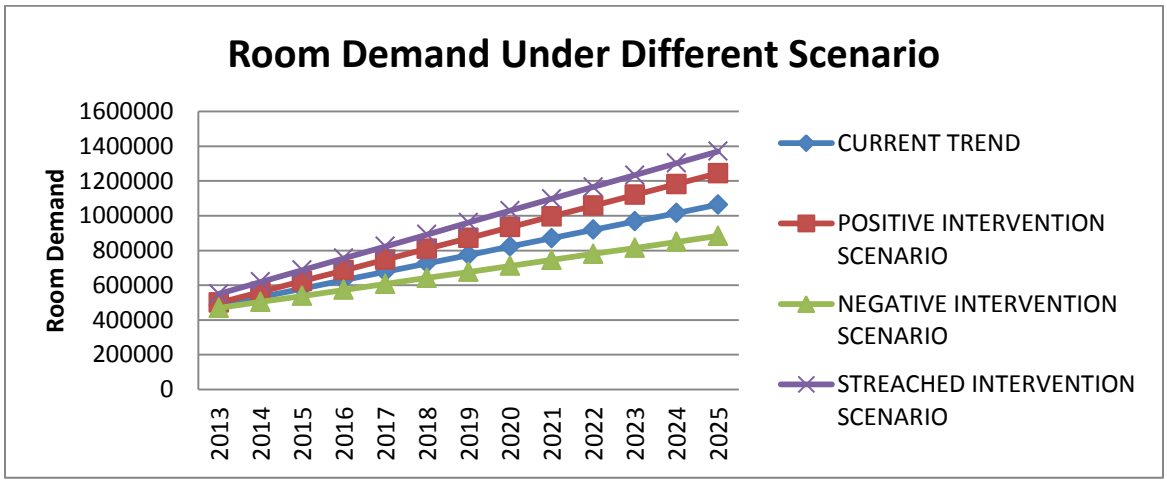


Fig 4-23: Room demand under different scenario

4.5.3. **Establishing supply condition**; (Establishing Existing Supply)

To establish the existing supply condition, it was important to visit the varies stake holders in tourism and Hotel sectors. Accordingly , different government & sectorial association (organization) are approached .The main source of information used are Addis Ababa tourism office, which is operating under trade & industry sector ;Addis Ababa investment bureau ,as well as Addis Ababa hotel owners trade sectorial association (AHA).The information obtained from this different source are examined to establish the current stock of hotel rooms. However, it is important to acknowledge that the data obtained are not that organized in sense that it did not show an updated current condition, the last update of the data in case of tourism office is done at list two years back .in order to establish the current and future room supply condition certain adjustment estimation is made.

Supply data;

The data obtained from Addis Ababa culture &tourism bureau (AACTB), shows that there are 108 hotels listed in Addis Ababa (data was last updated in 2012) ,the data shows the hotels has different category it includes from basic service up to five star level. However the classification was not done based on established standard. Currently the Ministry of culture & tourism has established standards is doing a concerted effort of assessing & classifying the hotels in Addis Ababa. The number of available room from these hotels are indicated as 5320. However, it is important to note that although the data provides good reference point, it cannot be considered as exhaustive list of hotel rooms in the city.

The data obtained from Addis Ababa hotel sectorial association indicates similar figure in fact it looks like the same the source of the data is used, however AAHS has adjusted the figures to

6000rooms by considering the increase in supply for last two years, estimate the number of rooms to reach 10,000 within the coming few years (AHA Apr-June 2014)

Information from Addis Ababa investment agency; Addis Ababa investment agency (AAIA) data shows the number of investors who has taken investment license in hotel sector reaches pick in 2012 ,reduces in 2013 &2014. The expert in the investment office also high light there observation that the number of project which has been realized is relatively small compared to the list of license issued.

Year	Three Star	Four Star	Five Star	Total	Approximate Conversion Taken as 20%
2014	11	12	1	24	5
2013	13	5	-	18	4
2012	24	16	16	56	11

Table 4-3 New Hotel investment License

Number of license issued for hotel investment (source AAIA)

The last column shows based on information from the AAIA experts, it is assumed at list 20% of the investors who has requested for investment license may realize there plan to build the hotel. considering the capital intensive nature of the investment, it`s long phase of development (construction time) as well as the challenge to get loan from the bank, it is considered reasonable projection of implementation rate.

Establishing current stock of hotel rooms; based on the information obtained from Addis Ababa tourism office as well as Addis Ababa hotel association (AAHA) ,it is understandable that the data miss or did not reflect the current stock of hotel rooms due to exclusion of newly open

hotels in Addis Ababa as 2013.There for it is reasonable to agree with the estimate given by AAHA which sets the current inventory to 6000 bed rooms .This figure is considered to reflect the status in 2013.since the construction activity to build the hotels take at minimum four probably five to six years considering Addis Ababa construction sector activity. The hotel project which has taken license as of 2012 is expected to be finalized& contribute to room stock as of 2016. Considering the star of hotels assuming at minimum 100 -120 rooms per hotel (efficiency to run hotel operation require at list to have such room numbers per hotel), these hotels are expected to contribute additional 2000-2400 rooms up to 2020. This is assuming the factors which influence the sector activity did not change much (cateris paribus), the same amount of additional hotels rooms can be expected beyond 2020 towards 2025. Which will have an effect of pushing AAHA estimate of 10,000rooms towards 2025. The expected annual room supply condition can be as indicated below.

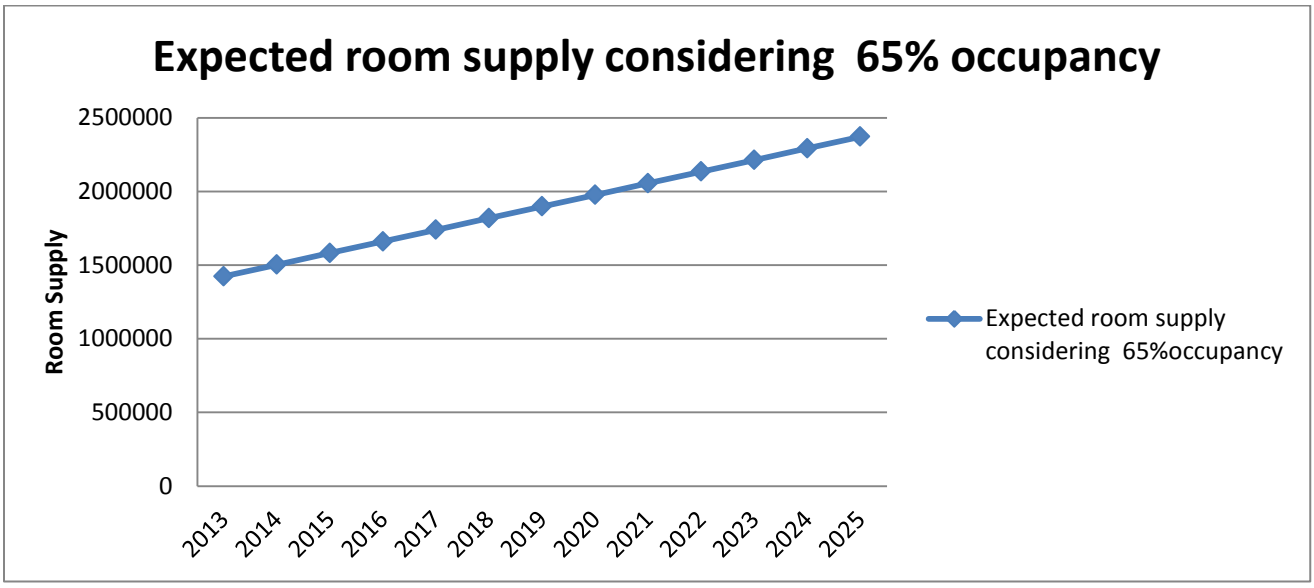


Fig 4-24: Expected room supply considering 65% Occupancy.

65 % occupancy is taken from industry standard norm of taking such occupancy level to sustain operation, which can have reasonable return on investment especially for newly opened hotels.

4.5.4. Gap Analysis

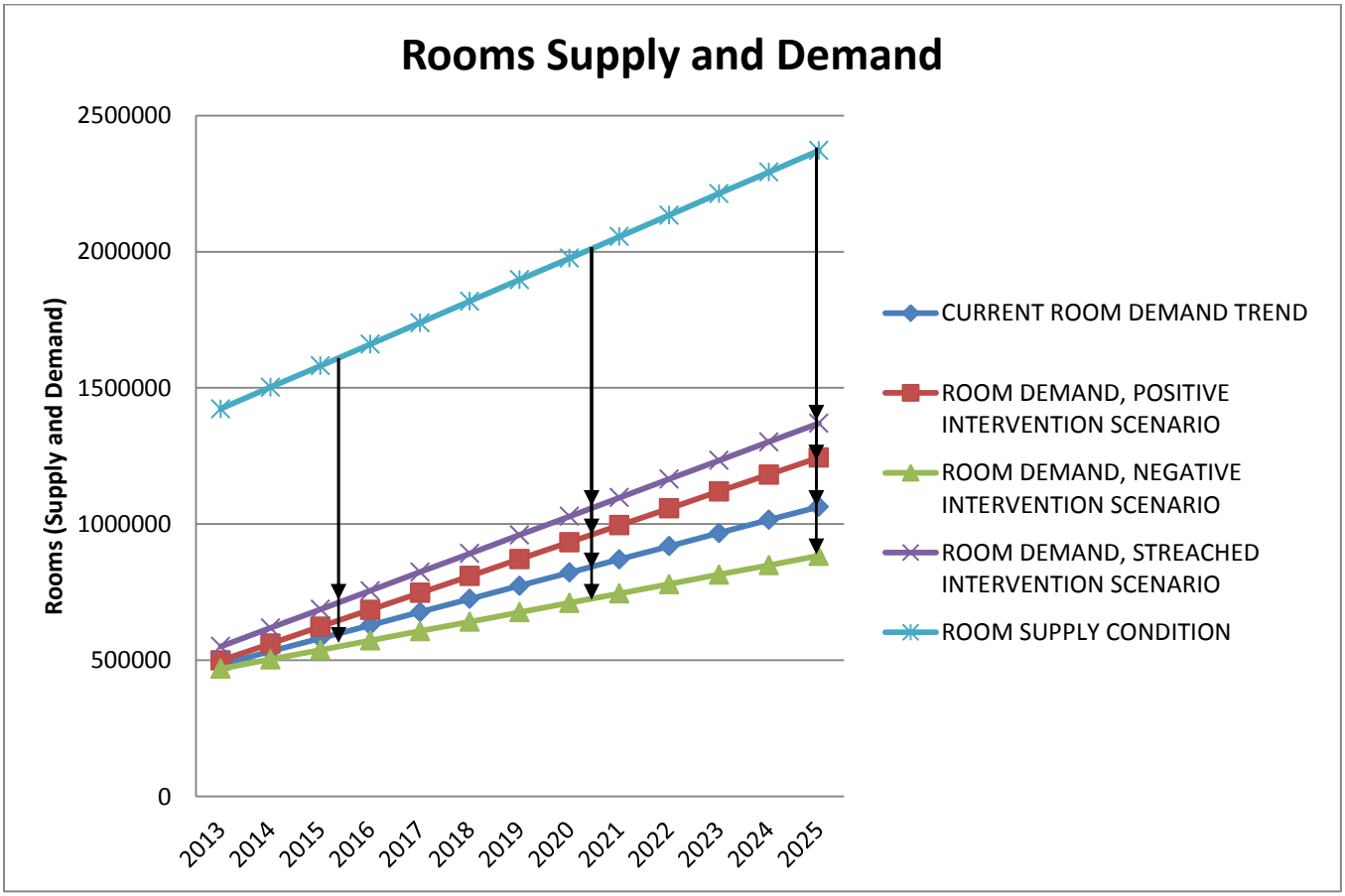


Fig 4-25: Gap analysis: Room supply and demand.

Supply vs. demand Different case scenario	Year		
	2015	2020	2025
Supply vs. demand gap (actual trend)	1000639	1154101	1307564
Supply vs. demand gap (negative intervention scenario)	1043291	1265532	1487772
Supply vs. demand gap (positive intervention scenario)	957986	1042671	1127357
Supply vs. demand gap (stretched intervention scenario)	894233	947598	1000963

Table 4-4 Gap Analysis for different Case Scenario

Comment; the comparison takes end of 2013 with 6000 rooms as initial supply condition, this point is taken as bases or reference point. Based on the trend of investment license issued from Addis Ababa investment office, the room inventory level is expected to reach to reach to ten thousand (10000)rooms by the end of forecast period 2025.however,this supply level is not taken as it is,a factor of 65% is used . This factor is occupancy factor which has effect of adjusting the supply condition to acceptable level of hotel business activity. In practice there might be more rooms coming to the market until the owners fill the market reality, under such condition there is possibility that the gap between the supply & demand increase even more, which will create fierce competitive environment which could lead to the lowering of room price & challenging business environment .Which in turn is expected to push some of the hotels out of the market .As a result the rate of opening or entry to the market is expected to adjust to the market requirement level. However, under the current circumstance, the analysis shows supply out strip demand even under starched intervention scenario for next ten years.

Chapter Five

Summary

5.1. Major Findings, The result shows among the list of candidate models, model (011) $(011)_{12}$ is the most appropriate model to forecast the monthly tourist arrival. Where us Model (210) $(011)_4$ is the most appropriate model for forecasting the long term quarterly arrival for the country. Furthermore the method has forecasted that the annual tourist arrival for the country in a year 2015, 2020, and 2025 is expected to be 798,157:1,130,971:1,463,743 respectively. By using funneling technique, it was possible to convert the forecasted annual tourist arrival of the country to annual arrival of visitors to the city of Addis Ababa, which has become the bases to establish the demand for hotel rooms. Accordingly, the demand for accommodation in Addis Ababa is projected to be 580,870; 822,428 & 1,063,987 for year 2015, 2020 & 2025. On the other hand the supply level is established by considering the existing inventory of hotels rooms as well as considering the number new hotels which is expected to join the market after some time. Accordingly the stock of hotel rooms in the city (Addis Ababa) is estimated to be 1,581,509;1,976,529;2,371,551,by year 2015,2020 & 2025 .which has helped to figure out the difference between supply and demand for hotel rooms in the city. The finding shows supply of rooms out strip the demand by 1,000,639:1,154,101:1,307,564 for year 2015, 2020 & 2025. In order to test the supply & demand relations under different circumstances a stepped function intervention scenario is used to establish different case. (Positive, negative, starched intervention) scenario cases have been investigated to foresee how the relation between supply & demand of accommodation sector come out. In all cases supply level is found to be much higher than the demand.

5.2. Conclusion; the study finding indicates that there is significant gap between the supply & demand condition on accommodation facility in city of Addis Ababa. The gap or the balance is in fever of supply. Which have significant implication on the operational performance of the hotels as well as the one`s preparing to enter the market in the future. This is an issue, which requires close follow up from different stake holders. As a result, it is important to point out that, a lot need to been done to increase the number of tourist arrival to country. Inoverall although quality of service delivery will be still an issue (which can also be mitigated by training, through experience) the availability of basic accommodation facility in the city assured. From the forecasted figures it is clear that the number of visitors to the country as well as the city of Addis Ababa is relatively small in comparison with the potential of the country as well as the supply of accommodation facility in the city. There for it is high time for the country to step up its effort to attract more visitors. Since the resource bases (attraction) and the infrastructure requirement like the connection Flight (Airline), Airport facilities, rod transport and the growing accommodations facility in the tourist attraction areas are already in progress, the work does not require starting from the scratch .The experience from other East African countries like Uganda, Ruanda demonstrate that it is possible to achieve high number of visitors arrival in short period of time.

5.3. Recommendation; long term forecasting by its nature, involve a great deal of uncertainty. The main problem with long term forecasting is that there is no guaranty that conditions remain the same, there is always a possibility that exogenous factors can influence & change the conditions. On the other hand models in the forecast process use past data as their bases to forecast the future &assumes condition remain unchanged .this by itself

contains inherent contradiction. The other point is that, In General long term forecast accuracy may not be as good as the short term forecast; therefore it is important to acknowledge the limitations of long term forecasting.

As it is indicated in the data presentation, the forecast process is based on the past data obtained from Ministry of culture & tourism MOCT, Arrival of tourist at national border by month. The result is obtained by the Use of box-Jenkins method which has created an opportunity to extend the forecast up to 2025. This process by itself stretches the forecast period to cover long time. Other than following the established process methodology, it was not practical to test the output until the actual figures for years to come has been publicized by MOCT. Therefore it fills important to high light that, it could be very help full if additional research is done using alternative approach or method to test& verify the output. As the case is long term forecast process the alternative method to check and validate the result could be use of qualitative method. There for It isrecommended, that Delphi method is used to incorporate industry experts opinion to verify the result obtained.

The other point is that the demand is calculated based on tourist arrival forecast. However, although it not expected to have significant impact for upper class accommodation demand, the local demand for accommodation could be significant especially for lower class accommodation. There for it might be important to investigate the level of local demand for accommodation as well.

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