SERVICE EXPORTS AND ECONOMIC GROWTH IN KENYA: A TIME SERIES ANALYSIS 1980-2018

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DECLARATION

This research paper is my original work and has not been presented for a degree award in any other university.

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This research paper has been submitted with my approval as the university supervisor

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Dr. Daniel Abala Date

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DEDICATION

This research paper is dedicated to my family, for their unwavering financial and moral Support towards my education.

ABSTRACT

The view that strong economic performance can be export led has been explored critically on the merchandise exports front however service exports, whose importance is seen to have increased in the last decade, have received little attention. Understanding the role of service exports in an economy is essential in considering service exports as a possible source of growth. This study was conducted to empirically investigate the link between exports of services and economic growth in Kenya and if such a link exists the causal relationship, analyzing time series data for the period 1980-2018, from World Bank data base and the Kenya Bureau of statistics publications, using Vector Error Correction Model and Toda and Yamamoto augmented Granger causality test. The results indicate presence of a long run relationship between the variables and a short run relationship between, gross capital formation and service exports with GDP per capita while export of goods and compensation of employees did not show any short run association with per capita GDP. The results also indicate that a bidirectional causality exists between gross capital formation, export of goods and compensation of employees with GDP per capita but only a unidirectional causality from service exports to GDP per capita exists. Therefore policies to encourage service exports such as investment in research and development to improve Kenya's position in world service market, improvement in terms of trade, increase FDI in the service sector and human capital improvement through education and training could be an important drivers of its economic growth.

LIST OF ABBREVIATION AND ACRONYMS

ADF	Augmented Dickey Fuller
AIC	Akaike Information Creterion
ARDL	Autoregresive Distributed Lag
BOP	Balance of Payment
BPO	Business Process Outsourcing
COMESA	Common Market for Eastern and Southern Africa
EAC	East African Community
ECM	Error Correction Model
FDI	Foreign Direct Investment
GATS	General Agreement on Trade in Services
GDP	Gross Domestic Product
HHR	Hausmann Hwang and Rodrik
ICT	Information Communication Technology
IT	Information Technology
ITeS	Information Technology enabled Services
KNBS	Kenya National Bureau of Standards
MIC	Middle Income Countries
OLS	Ordinary Least Squares
PTA	Preferential Trade Area
R&D	Research and Development
SBC	Schwarz Bayesian information Criterion
SSA	Sub Saharan Africa

UK	United Kingdom
UNCTAD	United Nations Centre for Trade and Development
VAR	Vector Autoregressive
VECM	Vector Error Correction Model
WDI	World Development Indicator
WTO	World Trade Organization

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CHAPTER ONE: INTRODUCTION

1.1 Background of the study

The debate on what actually drives economic growth has been rekindled by the divergent development stories in China and India. China is seen to have pursued a more conventional manufacturing led growth approach, while India's development is as a result of growth experienced by the service sector. The services sector used to be regarded as a laggard sector not able to drive economic transformation which involves increases in productivity (UNCTAD, 2017) India's success story has made researchers reconsider their view on services. It has also made them reconsider the traditional belief that industrialization is the only possible path to economic transformation. In the last decade the importance of the service sector has been increasing, service value added now make 68% of the worlds GDP, nearly three quarters of GDP in high income countries and about 57% in middle and low income countries (Priyankara and Li, 2018). Following the growing importance of services in their contribution to GDP, trade, employment and productivity it is important to include them in the debate for economic transformation.

Globally the highest output in the economy is accounted for by the service sector, According to (WTO, 2010), this sector makes up above two thirds of global gross domestic product (GDP) and services share in output and value-added in GDP increases with countries levels of income. In Kenya since the 1980s this sector has performed particularly well. The sector's average annual growth rate has been above that of many Sub-Saharan countries since 1970s. Kenya has the largest service economy in EAC and is the leading exporter and producer of services in this region. In comparison to the 5.0 per cent rate at which the sector grew in the sub-Saharan region during the second half of the 1970s, Kenya set a higher annual growth rate of 7.4 per cent. In 2012 Kenya produced about $19 billion

worth of services accounting for almost half the country's output and the largest share of EAC total services output of 43 per cent.

The percentage of service in Kenya's GDP has been substantially more than other sectors since 1970s and has continuously risen overtime from 45.7 per cent in 1970 to roughly 57 per cent in 1999. By 1997, the contribution of services to GDP was almost twice that of agriculture (29%) while the manufacturing sector contributed a fifth of the services share (11%) (Ikiara *et al*, 1999). Services now make up about half of Kenya's GDP prevailing as the biggest and most dynamic sector in the economy.

Services have also contributed to employment and productivity. The service sector is the largest employer in developing countries where service jobs represent 44% of total jobs and is responsible for majority of labor productivity change. From 1970 to 1998 services in Kenya contribution to total wage employment grew from 49.6 per cent to 62 per cent and by 2008 it made up roughly 68 percent of the total wage employment in Kenya. In terms of productivity, the productivity of Labor in this sector is thrice that of agriculture and 1.5 times that of industry (Velde *et al*, 2015).

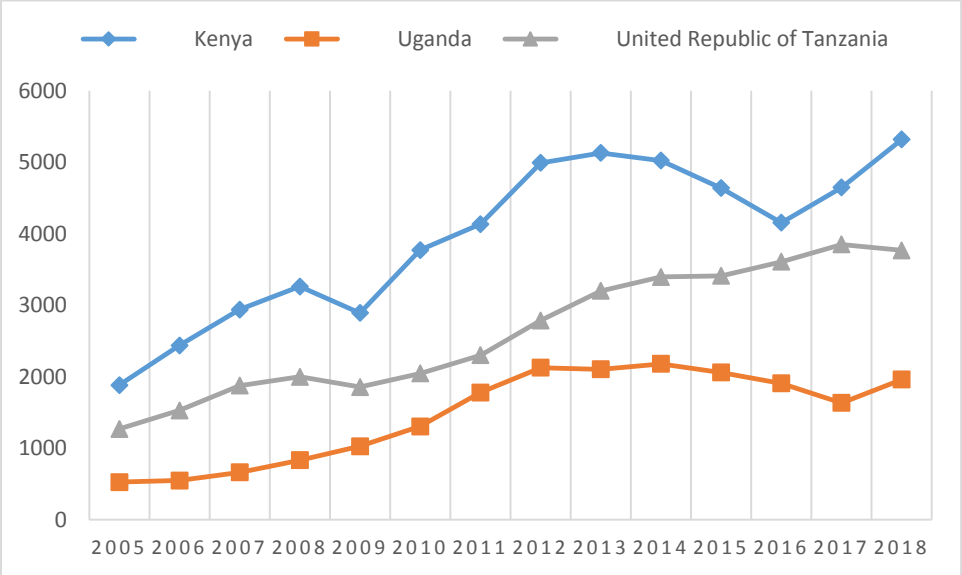
The percentage of services in Kenya's total exports has shown an upward trend from 41 per cent in 2006 to 44% in 2012, they were valued at $3.9 billion having expanded by 154 per cent from 2005 showing their importance in Kenya's exports. The major contributors to service exports being; distribution and transportation services, financial services, ICT services and business and professional services. The contribution of service exports to Kenya's balance of payment has been remarkable in the past three decades. Service exports have continually been a stabilizing factor in the position Kenya's balance of payments with trade in services projecting an overall net surplus, while trade in goods showed persistent net deficits since the 1973 oil shock (Ikiara *et al*, 1999).

According to Velde *et al,* 2015 service exports in Kenya tripled between 2005 and 2012 while merchandised exports only doubled in the same period indicating the fast growth rate of services. This sector has been a significant part of Kenya's economic development and has expanded by 5 per cent since 2008 faster than both manufacturing and agriculture in the same period. This performance of service sector is attributed to the unique position occupied by Kenya to export services all through East Africa and the world. The World Bank suggests that, there is a clear comparative advantage in producing services in Kenya, and it exports a larger percentage of services in comparison with other countries with the same levels of income, its remarkable success in the IT industry especially in mobile telecommunication and business and professional services has made great impact on the domestic and international market. Kenya's internet and mobile penetration rates are remarkably high and the internet economy's effect on GDP is reportedly greater than most developing countries (Velde et al, 2015).

Evidence has shown that services matter for economic development, employment and improved balance of payment. They have become a considerable boost to economic growth in Kenya and this trend is expected to continue. Although Kenya has a potential to produce and export services, little thought has been given to the contribution of service trade as a source of economic growth.

This study will contribute in enlightening policy makers on the importance of considering trade in services as an alternative source of growth.

Figure 1 dynamism in service exports for major service exporters in the EAC ($ million)



Source: UNCTAD (2018)

1.1.1 Structure of Kenya's trade in services

Service trade is mostly categorized into the 12 categories as indicated by the WTO GATS: business related services; communication; construction and related engineering services; distribution services; education; environmental; financial; health-related and social services; travel services; recreational, cultural and sports services; transport; and other services. The World Bank however categorizes services in four broad categories: travel services, transport, communication and finally financial and insurance services.

Services differ from goods and as such, their mode of delivery across the border is different. The WTO has defined the delivery of services using four modes:

Table 1: Modes of supply

Mode 1: Cross border	Services move across the border while supplier and buyer do not move.
Mode 2: Consumption abroad	Buyer moves to another country to consume the services e.g. tourism
Mode 3: Commercial presence	Service providers set up shop in the buyer's country.
Mode 4:Temporary movement of persons	Supplier moves temporarily to the buyer's country to provide the service.

These modes are not necessarily independent of each other and could be substitutes or complements (Francois & Hoekman, 2010)

1.1.2 Evolution of service exports in Kenya

Kenya, a member of EAC, is the main producer and exporter of services in the EAC; the largest market for Kenya's service exports. According to Mbithi and Chekwoti (2014) since 1980s exports of services in this region have grown ten times while its imports have grown six fold and by the 21st century the region became a net service exporter. The contributors of this development are associated to the positive outcomes emanating from structural and macroeconomic policy change adopted by member states in the early nineties. Kenya was seen to be doing much better than most Sub-Saharan states. The latter half of the 1970s saw the service sector documenting a yearly growth rate of 7.4 per cent in comparison to 5.0 per cent rate registered by the whole Sub-Saharan Africa (Ikiara *et al*, 1999).

This development was further aided by the EAC integration programme. Commercial service liberalization was at the heart of this. The alliance inaugurating the EAC (EAC, 1999) equipped the formation of the EAC Common Market to improve continued collaboration in trade liberalization and development. This facilitated the realization of the Community's goals (Mbithi & Chekwoti, 2014). The EAC began its progressive common market in 2010. Some of the main agreements by member states are to do away with policies that limit mobility of services and their suppliers, and to harmonize requirements to certify the reputability of the traded services.

The results of this agreement are seen in the Kenyan service exports, they have shown an upward trend since then. Kenya's exports of services were valued at $3.9 billion in 2012, having expanded by 154% from 2005 and have grown by 5% yearly from the global recession of 2008. This expansion was more rapid than both agriculture and manufacturing (Serletis, 2014).

The key to Kenya's service export growth was the ICT revolution experienced in the early 2000s making it the undisputed leader of mobile money technology. This revolution facilitated the access of both mobile phones and the internet by millions of people. Kenya enjoys exceptionally high mobile and internet penetration, penetration now stands at about 46.8 million subscribers conducting mobile commerce transactions of up to Ksh 1.552 trillion in the third quarter of 2018. The effect of this revolution is felt both in ICT services and financial services. In 2012 Kenya exported ICT and financial services worth $ 468 million and $217 million respectively, making it second to South Africa in the export of these services in Africa. Between 2001 -2012 service exports from Kenya to the UK almost tripled from $192 million in 2001 to almost $650 million by 2012, apart from a sharp drop in 2008 resulting from the financial crisis.

Among services exported by Kenya a few categories have been seen to show meaningful growth overtime and are becoming important globally. Key among them are Financial and Insurance services, Travel and tourism related services, Transportation and Business services. Kenya is heavily involved in trade of financial services both regionally and globally. Commercial banks in the country have established numerous linkages with both regional and international financial institutions, PTA and trade and development banks. The PTA agreement has triggered the formation of a critical institutional infrastructure that is predicted to foster intra-regional trade (Ikiara, Muriira, & Nyangena, 1999).Kenya has realized rapid financial development as well as some Sub-Saharan states. Financial services had increased to 5.2 per cent of GDP by 2012 (KNBS, 2013) and a lot of the pointers of financial development were advancing or even outdoing those of middle-income countries (MICs), showing its unmitigated prosperity in this sector (Velde *et al*, 2015). Kenya is also a world forerunner in mobile banking where majority of the populace over 18 years of age can easily get financial services via the platform. Despite the fact that Kenya's financial exports seem small by itself compared to the already anchored Asian hubs, they are beginning to build and grow rapidly. Insurance services face a trade deficit in Kenya; imports of insurance are greater than exports from the same sector. The growth of this sector could be hindered by impeding legislation especially on investment of insurance funds, lack of qualified personnel, poor infrastructure and low level of literacy.

Tourism contributed 11.8% of GDP in the country in 2014 as well as being the best foreign exchange earner and the top service sector. Direct tourism and other related travel services accounted for 16.6% of the visitor exports in 2014 while contributing 4.1% of the total Kenyan GDP in the same calendar and is predicted to increase by 5.1% yearly from 2015 to 2025 (World Travel and Tourism Council, 2015). The council also indicated that tourism

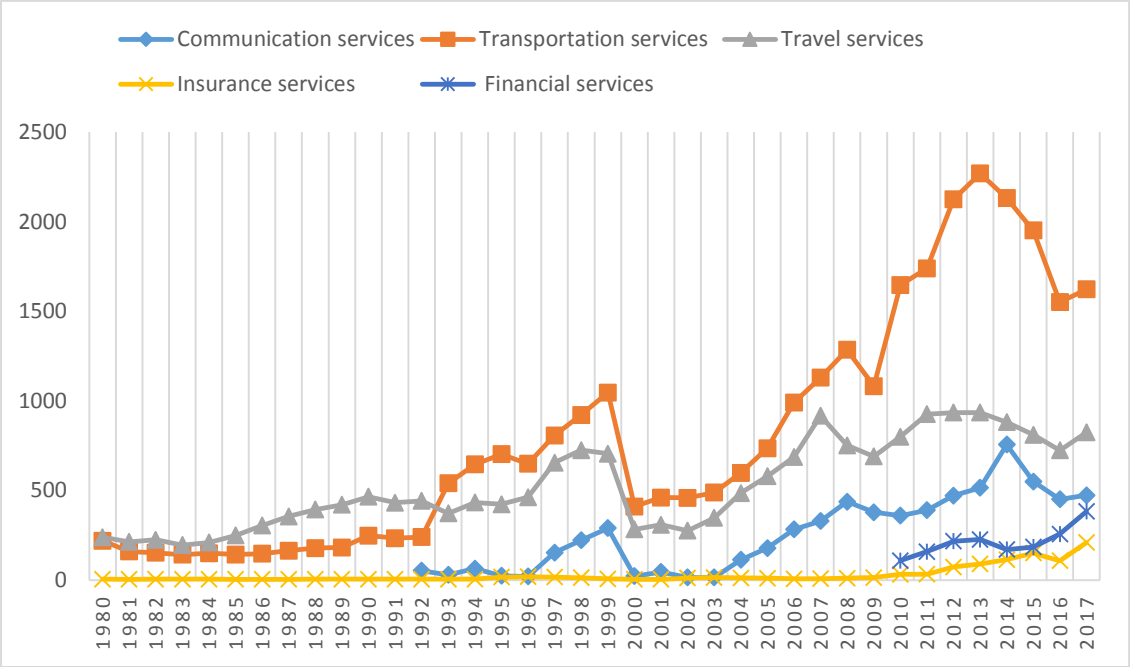
contributed 9.2% of total employment in 2014 and is projected to rise by 2.9% every year. The sector was affected by serious social unrest between 2007 and 2008 followed by numerous terrorist attacks in 2011, 2012 and 2015 it rebounded and was projected an upward trend between 2012 and 2015, a sudden and continuous decline was however experienced again in 2016 to 2017 where tourism contribution was about 8.8% of GDP in Kenya. This decline was attributed to the surge of regular terrorist attacks that affect the positive image of a country and even jeopardizes its entire tourism business (Eichler, 2014) however by 2019 the sector was seen to have bounced back and contributed 12.5% of GDP.

The transport sector contributes 6-12% of economic output and a comparable share of employment in most countries. In Kenya it accounted for about 8-9% in 2017 (UNCTAD, 2018). There are reasons why this sector is becoming important in Kenya. Kenya is strategically placed as distribution and transportation hub for East Africa, having its railway begin in a major city and end in the largest port in East Africa and gateway into the Indian Ocean and has doubled its capacity in the last decade. Kenya also have developed infrastructure and rejuvenated aviation system. There is also increased freight volumes in Kenya as Kenya is today one of the largest exporter of cut flowers and vegetables. More than 50 per cent of Kenya's services output in 2013 supported logistics services, mainly wholesale and retail ($4.5 billion) and transport and communication services ($4.0 billion) (Serletis,2014). Contribution of transportation sector in service exports in Kenya has lingered around two fifths of aggregate service exports in the early 2000s (World Bank, 2010; Section 3.1).

Business services comprises of accounting, architectural, engineering, legal services, business process outsourcing (BPO), ICT services, information communication technology enabled services (ITeS) and others (Dihel *et al*, 2011). Kenya enjoys considerable high

mobile and Internet diffusion rates, and the input of the Internet economy to output purportedly transcends that of most other countries that are still developing, penetration surpassed the 100% mark in 2018, due to users having multiple sim-cards, with 42.2 million internet subscribers and the internet alone contributed 3 % of total GDP in 2012 and has been growing ever since. Due to this development Kenya has become an IT power house and a regional leader. IT service exports which include telecommunications were valued $468 million in 2012. (Velde *et al*, 2015) according to the ministry of ICT the contribution of the sector by 2018 was $390.2 billion a growth of 12.9% from the previous year. An economic update by the World Bank in 2019 indicated that Kenya's ICT sector has grown at an average of 10.8% annually since 2016 and that the sector had outperformed every other sector and it is expected to increase its share as far as 8% of Kenya's GDP via IT-enabled services (ITeS) creating up to 250,000 jobs by 2020. A large number of countries that are still developing seem to export elemental business services like back office functions and lower level offshoring, while Kenya having many outstanding firms supply's and exports high level offshoring services like product development, R&D business ventures and transformational sourcing (Dihel *et al*,2011).

Figure 2 Service exports per sector in Kenya from 1980-2013



Source: WTO and authors calculation

1.2 Research Problem

Much discussion on economic changes has been centered on shifting agriculture towards manufacturing while giving little or no attention to the contribution of services in these strategies (UNCTAD, 2017). However manufacturing, agriculture and natural resources which developing countries are seen to concentrate on as engines of economic growth are more prone to macroeconomic shocks such as political cycles, fuel prices and face numerous trade barriers. Due to this factors their contribution to GDP has immensely declined. Trade in services has demonstrated relative resilience during the past financial and economic crises, in terms of extend of decline, uniformity of decline among countries and easier recovery. This has made many countries incorporate service trade into the post-crises national trade strategies (UNCTAD, 2019). Services are becoming highly tradable

due to technological advancement. Not only can services now be stored or sold digitally, they are also not susceptible to the numerous trade barriers that physical exports face (Mishra.*et.al* (2011).

New advancements suggest that even though manufacturing is still the main driver of growth, services must be included in the debate (Mishra.*et.al*.2011). Service sector has shown unprecedented growth overtime, studies show that trade in services has been growing at an average of 7.9% annually since 1980 (World Trade Organization [WTO], 2010). The Services share of global GDP has grown in the last ten years accounting for above 68% of the world's GDP, and export of services in 2007 is almost thrice its initial amount in 2007 for developing countries (Mishra.*et.al*.2011). Studies show that as income levels increases the percentage of services in total output in most countries increases, the cause of this outcome and its future implication have scarcely been analyzed.

As suggested by the World Bank, Kenya's aggregate exports is the "weaker" engine compared to domestic consumption and has been declining sharply in relative importance, despite this decline the contribution of service exports in aggregate exports has been increasing. Between 2006 and 2013, 72 percent of the rise in Kenya's output originated from services, during this period Kenya's agriculture sector suffered weather shocks which caused its share in GDP to decrease by 4.5 per cent between 2006 and 2014. During the same period, Kenya's manufacturing share of GDP stagnated at an average of 11.8 per cent and unlike merchandise exports which have constantly had a trade deficit, service exports in Kenya have an overall trade surplus.

Regarding service export, from the early 1980s, trade in services is seen as the fastest-growth area of trade globally. Cross-border service exports on its own grew every year by a rate of about 12% from 1985 to 1995 outstripping the already strong growth of merchandise trade in, which increased by a yearly average of 11% in that period (Barth, D. (1999)). By 2010 about 75% of global economy was accounted for by services and 45% in developing countries (Ghani and Kharas, 2010). A study by UNCTAD, 2017 noted that the contribution of services to GDP was increasing within every income level from 1980 to 2015 along with a 61 to 76 percentage rise in high income countries and from 42 to 55 per cent in low income countries by 2015. The average growth rate of export in services in developing countries has been greater than that of developed economies for the last decade. Their service exports are growing faster than goods exports, these countries can tap into this trend as an alternative source of growth. The service revolution has altered the nature of services making them more tradable and according to Blinder (2006) current worldwide integration of services is just a 'tip of the iceberg', developing countries can maintain a service led growth because there is still a lot of capacity for catch up and concurrence.

This trend in service exports is similar in Kenya, a study by (Velde, Tyson, & Khanna, 2015) on 'Kenya as a Service Hub' showed that between 2005 and 2012 Services exports grew to $4.9 billion from $ 1.9 billion while merchandised exports only doubled in the same period. The study further indicated that the contribution of services to exports in Kenya was 41% in 2006 and shot up to 44% in 2012. This shows the importance of service as a component of total exports in Kenya. While acknowledging and emphasizing the potential of service exports as an avenue of economic development, studies on its part, especially in the context of Africa has not received enough consideration (Mishra *et al*,

2011; Tang 2017). More studies need to be undertaken to investigate the implication of these trends in service trade on economic growth.

Kenya faces an ever growing balance of payment deficit and from literature it is clear that the deficit is originating from goods, Kenya has a tendency of importing more goods than it is exporting. Therefore the benefits from service exports can be two fold, first given that the sector and export of services are significantly large and are also rapidly growing in Kenya and have continually shown a balance of payment surplus, service exports can be helpful to offset BOP deficit. Secondly if service exports cause economic growth, service export- led growth can prove to be an alternative source of growth in the Kenyan economy.

Fundamental to this Paper is the concept that almost all services can be traded even though not all service sectors are producing tradable services (Zahler *et al*, 2014).

To determine whether service trade and especially service exports is a potential channel for growth we need to have a clear insight of the association between service exports and economic growth. On this subject this paper strives to empirically scrutinize the link between service exports and GDP in Kenya.

1.3 Research Questions

This study aims to answer the following research questions:

i. What type of relationship exists between service exports and economic growth in the Kenya?
ii. What type of causal relationship is there between service exports and economic growth in Kenya?

1.4 Research Objectives

The main aim of this study is to empirically investigate the relationship between service exports and economic growth in Kenya.

1.4.1 Specific Objectives

The specific objectives for this study are:

i. To analyze the empirical link between service exports and GDP in Kenya.
ii. To examine the causal relationship between service exports and economic growth in Kenya.

1.5 Relevance of the study

This study aims to contribute to the discussion about growth generating capability of service trade by providing insight on the trends in trade in services globally and especially in Kenya and its contribution to economic growth. Additionally it aims to enlighten policy makers on the relevance of considering trade in services as a potential channel for growth and formulate policies that facilitate increment of service exports and GDP.

1.6 Organization of study

Following this introduction is Chapter two which presents literature review; it tackles theoretical literature review, empirical literature and overview of the literature on export of services and economic growth. Chapter three will tackle research methods and techniques used, it will explain: theoretical framework, model specification, data sources, definition and measurement of variables used and estimation techniques applied. Chapter four will present empirical findings and Chapter five will outline summary, conclusions and policy implications.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This section consists of three parts, that is, theoretical literature review, empirical literature review and overview of literature.

2.2 Theoretical literature review

The role of trade in economic advancement dates back to classical economists. Adam smith in his theory "vent for surplus" recognized free trade as an outlet for excess production capacity of a nation and that it promotes economic growth. Early classical economists recognized services as different from goods while describing labor productivity, however much attention was not given to trade in services or services as drivers of growth since they considered services as inputs to agriculture and industry. This is no longer true services can now lead rather that follow growth as it was previously assumed.

Overtime the traditional notion that services were only to be consumed domestically and that they required face to face contact (Baumol, 1967) has changed due to technological changes and globalization of services. According to Kharas and Ghani (2010) dynamism of services has changed and services today can be produced, stored and traded online globally and unlike goods are not limited to time and space. Due to this changes researchers' interest grew in the direction of testing ELGH on disaggregated exports such as manufacturing exports, primary exports and service exports with the view that causality might exist in the case of disaggregated exports (Rangasamy, L., 2009, Herzer et al, 2006).

Literature also suggests that the theory of comparative costs can be used to explain service trade just like merchandise trade. According to Copeland and Mattoo (2008), gains from trade and comparative advantage are the two main causes of trade in services, other than these two other important determinants of service trade include technological development, domestic policies and regulations, human capital, trade agreements, quality of infrastructure and market size (Shingal, 2010, Saez and Goswami (2010)).

The change in nature, tradability and growing importance of services in GDP growth has led researchers to explore various aspects of services, this growing interest in services is also motivated by the fact that a rise in service exports is seen to bring about technological transfer, Improve balance of payment position, generate employment and improve productivity (Hoekman and Mattoo, Stojkoski et al, 2016).

According to advocates of export-led growth hypothesis, with free trade and production based on increasing returns, exports are capable of being a constant driver of total factor productivity (TFP) improvement (Melitz ,2003; Mohammed et al ,2012) and according to Ghani (2011) labour productivity of services exceeds productivity of labour in industry both for developing and developed countries, labour productivity for firms that export their services has also been seen to exceed that of their non-exporting counter parts. (Velde and Hoekman, 2017).

According to Balchin (2017) and Mendez-Parra (2017) trade in services has also contributed to productivity change in developing countries. Services are not only just l inputs for merchandise trade, but can also be produced, exported and consumed directly. A study by Stojkoski et al. (2016: 2) concurs and points out that because of the current technological transformation, especially the advancement in disruptive technologies and

the internet of things, with the accelerated rise in both transportation and commerce services, trade in services has become a commodity to be directly consumed.

There has been growing enthusiasm on whether the rise in service exports, their sophistication due to technology development, provides an substitute path for economic growth for developing countries (Mishra et al, 2011; UNCTAD 2004; Sannassee et al, 2014;), because according to Fourie (2011), a growing service sector is linked to an increasing per capita income and rise of a countries level of economic development.

Other researchers are seen to be skeptical about the dynamism of trade in services. Langhammer (2002) suggests that success episodes in trade in service economic transformation such as India are outliers and he argues that the growth of developing countries services exports will be "limited only to country episodes, but will not have the same country wide coverage as growth of manufactured exports."

Major determinants of the growth and worldwide integration of services were studied by Jalvagi and Martin (2007), the study suggested that inception of WTO and GATS, information and telecommunication technologies, numerous regional trade blocks and heightened service intensity of manufacturing sector are the main drivers. As literature has suggested service interpretation and measure related to services are complex and not transparent. Policies governing the movement of services have been found to be very important determinants of service exports, countries that have adopted free trade have developed much faster overtime (Vijayasri, 2013). There has been effort by the WTO to encourage all countries to liberalize trade so as to enjoy gains from free trade (Anderson, 2001).

Literature has also shown that other aspects of service exports such as liberalization and outsourcing have also sparked interest and researchers have explored how these aspects affect growth. The openness in financial and telecommunication services was examined by Mattoo, Rathindran and Subramanian (2007) to prove it as an essential driver of long run economic improvement while Fixler and Siegel (2004) also investigated the categories of service exports and productivity returns from outsourcing.

As indicated from the above theoretical review, it is evident that trade in services performs a fundamental task in the economic development of a country, this study attempts to determine whether a connection exists between service exports and GDP in the long run.

2.3 Empirical Literature Review

Multiple researches have previously been undertaken to determine the association between service export growth and economic growth. Hanson et al (2019) investigated the long-term connection between real GDP per capita and service exports in Mauritius, total services and disaggregated, using a newly created sub-divided dataset from IMF BOP, and the ARDL technique. The findings indicate evidence of a significant long run link between aggregated service exports and real GDP per capita. Moreover, the findings reveal that of all the categories investigated, it is only trade and business and insurance and pension services that have a significant long-run impact on growth. The results also indicate causality running from economic growth to aggregate export of services and trade and business and bidirectional causality between insurance and pension and economic growth. A similar study by Priyankara and Li (2018) analyzed asymmetric cointegration between exported services and economic performance in Srilanka using nonlinear ARDL found out that economic growth is more sensitive to service exports decline than its increase. Another study by Dash and Parida (2016) used VECM, ARDL and impulse response functions to

investigate the connection between service trade and economic growth in India, found indication of service exports- led growth, the study overcame the possibility of correlation by using GDP netting out of service exports as a dependent variable.

Mohamed, Chung and Said (2012) uses VAR model on yearly data from 1980 to 2009 to scrutinize the long run association between trade and expansion of the economy in Tanzania. Exports in this paper are divided into services and merchandise exports. The findings reveal that a long-term association between service exports and economic growth is present and that economic growth caused service export, they however find no correlation between merchandise exports and economic growth. A variation of this study by Sandri *et al* (2016) examined the growth contribution of service trade and goods trade in Jordan using fully modified OLS approach which corrects for endogeneity and serial correlation established a positive relationship between service trade and economic performance while merchandise trade negatively affects growth. This was explained by the persistent trade deficit experienced along with a high percentage of imported consumption goods to total imported goods.

Studies on the growth, sophistication and technological development in service exports have emerged. A study by Mishra *et al* (2011) using a constructed index of "service exports sophistication" based on HHR index evaluated the impact of service export sophistication on economic advancement. The findings show a positive correlation between per capita income growth and increasing quality and composition of service exports.

Some studies have taken a more generalized view and moved from a specific country and investigated the impact of service exports across a number of countries. A study by A. Gabriele (2006) studying the connection between service exports and economic performance, run regressions on growth rate of service exports and that of goods exports

on growth rate of GDP. The study concluded that service exports positively impact long run economic growth in countries that are developing, it also suggests that in the 1990s this connection was poorer in developing countries in comparison to their developed counterparts and that the growth augmenting impact of total exports was seen to decline in developing countries, this decline is attributed to the merchandized component rather than the service component of exports .Alege and Ogundipe (2015) analyzed panel data of thirty three Sub-Saharan countries analyzed using ordinary pooled, fixed effects and random effects model techniques, investigating the effects of service trade on the development of the economic in SSA countries, found out that both service exports, imports, labor and capital enhanced economic development in SSA countries.

Other studies have investigated the effects of sub-service exports like financial, telecommunication and tourism on economic growth. Mattoo et al (2011) focusing on financial and telecommunication, inspected the influence of free trade on economic advancement, the findings show that liberalization in services exports (telecommunication and financial) affects long-term economic performance, a similar study focusing on the same sub-services by Khoury and Savvides (2006) employing threshold regression method, examined how trade openness had different effects on countries according to their levels of income, the outcome indicated the presence of a positive and meaningful connection between telecommunication services and economic growth below a certain predetermined threshold whereas when it comes to financial services the association was positive and significant for income levels above the endogenously determined threshold and insignificant below.

Tourism sub-services have received much attention since many countries are seen to endorse tourism as likely cause of economic growth. Numerous researches have been undertaken to examine tourism-led growth hypothesis, most of them using multivariate cointegration technique and causality tests, the results for majority of them reveal the presence of a long-term correlation between tourism and economic performance and the findings also show that tourism causes economic advancement for a number of these studies. (Francis and Drakes (2011), Durbarry, R. (2004), Fayissa et al., 2008, Shan and Ken (2001))

However one shortcoming of the studies that tested causality is the choice of lag structure which may affect results, a study by Priyankara (2018) tried to solve this problem by employing Toda and Yamamoto augmented granger causality approach, which helps solve the problem of lag structure choice and is robust for integration and cointegration therefore prevents pre-test bias, to analyze the causal link between export of services and GDP in Srilanka. Their findings suggest unidirectional causality from service exports to growth exists.

Empirical studies have greatly differed on the approaches for data analysis on the subject of association between service trade and economic performance, the methods range from cointegration (Johansen, 1988), error correction and causality (Engle and Granger, 1987), use of the production framework to determine the association between exports and growth and panel data approach such as pooled OLS, random effects, fixed effects analysis technique. This study employs VECM and Toda and Yamamoto augmented Granger causality test to investigate the link and to establish the causal relationship between service exports and economic growth. This test is used because the Engle and Granger causality test is susceptible to lag selection and therefore it is used to solve the lag selection problem.

2.4 Overview of Literature

Literature is widely available for generalized research on international trade for aggregated goods and services, however studies that precisely analyze the influence service trade has on growth and development and particularly in developing countries are limited and those that exist for developing countries only a few are specific to the particular countries. Even with clear results on the impact of service exports on an economy such as those revealed by the few studies above there still exist a skeptical view on dynamism of service exports therefore little research has been done on it. The research on this topic if far from exhaustive and this implies that further studies need to be done to ascertain this outcome and its future implication. This paper studies the relevance of this discussion in the Kenyan case and will look at the empirical link between growth and service exports. The findings from this paper will be used to formulate tailored policy recommendations.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This section presents the theoretical framework, methods to be employed in the study, definition and the measure of variables, data sources and types and various tests that will be carried out.

3.2Theoretical Framework

The Export-led growth hypothesis has been useful in theoretically analyzing trade in general, where authors link the effects of exports on growth, to improved allocation of resources which led to production efficiencies (Beckerman, 1965) while others linked it to investment and technology (Haberler, 1959). A variant of the neoclassical growth model suggests that trade does not impact steady state output growth rate because growth was affected by an exogenous factor namely technological progress, for this reason endogenous growth model has been adopted to inspect the effect of trade on the performance of an economy. According to this model, in addition to labor and capital, growth is also influenced by a number of variables such as investment, education, population, and health (Mankiw, Romer and Weil, 1992). In this form trade variables and its aspects such as liberalization can have an impact on growth.

According to Hoekman and Mattoo (2008) if free trade reallocates resources from agriculture to manufacturing a positive effect on growth will occur as long as manufacturing has positive external effects or generates knowledge. This case can also be applied to the service sector. Specific services can generate endogenous growth, e.g. transport, telecommunication and financial services. This paper employs endogenous growth model to ascertain the correlation between export of service and economic performance. It proposes that growth is due to; adjustments in quantity and productivity of

labour, capital inputs and technological advancement. Two dimensions of services makes it a determinant of "fundamental" production factors, one is that it can be a direct input in production and another is it facilitates transactions without the hindrance of space or time.

3.3 Theoretical Model

This study considers a standard growth function given as:

$$Y= f (K, L, X) \quad (1)$$

Where Y is Per capita GDP (PGDP) used as proxy for growth, K is capital stock, L is labor force and X is exports.

To capture the effect of service exports on growth, exports are divided into goods exports (EXPG) and services exports (EXPSER) therefore the growth function becomes;

$$PGDP= f (K, L, EXPSER, EXPG) \quad (2)$$

By taking natural logarithm for equation (2) the following model specification will be estimated

$$LnPGDP= \beta_0 + \beta_1 LnGCF_t + \beta_2 LnCE_t + \beta_3 LnEXPSER_t + \beta_4 LnEXPG_t + \varepsilon_t \quad (3)$$

Where PGDP is per capita GDP which is used as proxy to growth, GCF is Gross capital formation, CE is compensation of employees used in the place of labor force, EXPSER is service exports, EXPG is goods exports and ε is the error term. We introduce natural logs to equation 3 to normalize the variables.

In theory capital and labour are predicted to have significant positive impact on output. An increase in factors of production will cause growth in output. Goods exports are expected to also positively influence GDP this is because merchandise trade is still the major cause of economic growth in Kenya. This sector is well developed and the volumes produced and

exported are large, therefore it is expected that increase in export of goods will cause economic growth. Service exports are also expected to positive affect growth since Kenya is seen to be a net exporter of services, the sector has also been seen to be expanding and growing rapidly contributing almost 50% of total GDP share and according to the World Bank, 2016 income gains from services are seen to be more beneficial in developing countries than trade liberalization with goods.

3.4 Definition of variables

Table 2: Definition of variables

Variable Name	Description	Measurement	Expected sign
Dependent variable			
Per capita Gross Domestic Product (PGDP)	PGDP is used as proxy for economic growth	US$ million in current prices	Positive
Independent variables			
Export of services (EXPSER)	Measures total value of service exports	US$ million in current prices	Positive
Gross Capital formation (GCF)	Used to measure net investment.	US$ million in current prices	Positive
Compensation of employees (CE)	Used as proxy to labour force.	Ksh million	Positive
Export of goods (EXPG)	Measures total value of merchandise exports	US$ million in current prices	Positive

Source: WDI, 2019

3.5 Data, Data Types and Sources

This study utilizes yearly time series data, for the period 1980-2018, for the macroeconomic variables Per capita GDP, service exports , goods exports, Gross capital formation, and compensation of employees(as a proxy of labour) . The data is Secondary data from WDI data bank; UNCTAD; Kenya National Bureau of Statistics (KNBS) publications; Economic Surveys and Statistical Abstracts.

3.6 Estimation Techniques

The methodology of estimation used in this paper is VECM and Toda and Yamamoto Augmented Granger causality test. Which follows certain steps, starting with performing stationarity test using ADF. In the next step, the time series are checked for the presence of cointegration using Johansen-cointegration technique. Finally, we run an error correction model (ECM) and perform Toda and Yamamoto Granger causality test.

3.6.1 Stationarity Test

The main assumption of classical linear regression model is that the moments of a series are time invariant, violation of this assumption might lead to spurious regression. Gujarati (2011) explains that a stationary series is essential because of these reasons, first, a non-stationary series behavior can only be observed for a given period meaning it cannot be generalized to other periods therefore affects forecasting. Secondly, regression on two nonstationary time series may cause spurious regressions. To find out whether all variables are stationary, Augmented Dickey-Fuller test, testing for unit root under the Null hypothesis that the variable is non-stationary is done. Any non-stationary variable, is differenced so as to make it stationary.

In this step we examine whether the variables order of integration is zero that is, if they are stationary. The ADF test equation which includes a constant and a trend is given by:

$$\Delta Y_t = \beta_{0+} \mu_i + \theta_i Y_{t-1} + \sum_{j=1}^{p} \beta_1 \Delta Y_{t=j} + \varepsilon_t \qquad (4)$$

Where $\Delta Y_t = Y_{t-1} - Y_t$ and Y is the variable being tested for stationarity, p is the number of lags in the explained variable, μ_i is a white noise term and ε_t is the stochastic error term. After determining the stationarity nature of the variables, cointegration test will be carried out to establish any long run association between the variables.

3.6.2 Cointegration Test

Two variables are thought to be cointegrated if they are independently non-stationary but their linear combination is stationary. The variables are cointegrated if they show any long run association between them. A simple way of doing a cointegration test is carrying out a unit root test on the cointegration regression residuals. This way cointegration relationship between variables which each have a unit root is investigated. Another way involves performing the Johansen test with the steps as follows. First step is inspecting for the order of integration, subsequent steps involve setting up optimal lag length model which is effected by omitting some variables that might influence the short-run changes of the model. This is because when variables are left out of the model they become part of the error term. The most common way of selecting the optimal lag length involves carrying out a VAR model using all variable before differencing. This process is repeated until zero lag length is attained. In all the models estimated in the above cases the AIC, the Schwarz Bayesian information criterion, concerning autocorrelation and heteroscedasticity are checked. The estimated model that gives the least AIC and SBC will be chosen as the one with optimal lag length.

This step inspects whether the non-stationary stochastic trends in the variables have a long-run relationship. To show that service exports and economic growth have any type of causality, it should be shown that they are cointegrated. The Johansen-cointegration technique is used to test for cointegration in this paper.

Finally if the variables are found to be cointegrated at level two and above, then ECM will be estimated.

3.6.3 Vector Error Correction model

As advanced by Engle and Granger if co-integration is present between variables then the proper method to employ to investigate the relationship between them is VECM since it shows the variables relationship in both short run and long run.

For cointegrated variables an error-correction equation exists that when simply put may take the following form:

$$\Delta y_t = \alpha \xi_{t-1} + \gamma \Delta x_t + \varepsilon_t \qquad (5)$$

An error correction term given by:

$$\varepsilon_t = y_t - \beta x_t \qquad (6)$$

Where ξ_{t-1} is the equilibrium error term, β represents the movement of y_t towards long-run equilibrium, while α and γ are represent short-run changes in the model. This technique cannot however capture causality between variables. We use the Toda and Yamamoto augmented Granger causality test to test for the causality between the variables. The outcome of this test in this paper is important for derivation of policy implications.

3.6.4 Causality test (Toda and Yamamoto augmented granger causality test).

Engle and Granger (1987) suggests that in the case where variables are integrated of order one I (1) and are correlated in the long run, then there is causality in at least I (1). Additionally a given variable (X) is said to cause another variable (Y) in a granger sense if X can be used to predict Y. Granger causality test, tests the null hypothesis that a variable does not granger cause another variable against the alternative hypothesis that it does. This test is however sensitive to lag selection, Toda and Yamamoto (1995) proposed the augmented granger causality test and suggested testing VAR (dmax+k) to deal with this problem. Where dmax is the order at which the data becomes stationary and k is the number of lag periods selected for the cointegration technique using VAR system. Since these variables are co-related through various channels, we cannot theoretically or empirically indicate the type of causality. Because of this Toda and Yamamoto augmented granger causality test is adopted to determine the direction of the causal relationship.

CHAPTER FOUR: EMPIRICAL FINDINGS

4.0 Introduction

This chapter presents the empirical findings on the effect of service exports on economic growth for Kenya. Descriptive statistics were captured in terms of means, standard deviation, minimum and maximum values of the observations. It further discusses correlation analysis, pre-estimation and post estimation tests and the discussion of results.

4.1 Empirical Results

4.1.1 Descriptive Statistics

Descriptive statistics provide certain necessary information on variables like patterns, trends and variations of certain variables. Table 3 outlines the descriptive statistics of the variables in the initial form employed in the study. The mean shows the average value of the variables. On the average, Kenya realized service export of approximately of US$ 2.14 billion between the periods 1980 and 2018. GDP per capita had a mean of $633.56 with a standard deviation of $410.80 Gross fixed capital formation had an average of $4.75 billion with a standard deviation of $4.58 billion. On the average, Compensation of employees was reported at Ksh 5.55 billion with a standard deviation of Ksh 6.73 billion. Export on goods averaged approximately $ 2.83 billion with a maximum value of $6.13 billion. The mean may be used to answer the question of the yearly average expected value of any variable and standard deviation the volatility or the variation of the variable from the mean. Compensation of employees shows the highest volatility and per capita GDP the least. Skewness and kurtosis assesses if variables are follow a normal distribution or not. Skewness estimates divergence from symmetry .All the variables are positively skewed. The coefficients of skewness are all below +2.0 indicating that indeed the variables are

within the normal distribution range. Kurtosis determines the evenness of the distribution from the findings in table 3 it shows that the variables distributions are sharper than a normal.

Table 3: Summary statistics

Statistics	PGDP	EXPSER	GCF	CE	EXPG
Mean	633.56	2.14E+09	4.75E+09	5.55E+09	2.83E+09
Median	421.3393	1.57E+09	2.13E+09	3.14E+09	2.01E+09
Maximum	1710.51	5.13E+09	1.62E+10	2.42E+10	6.13E+09
Minimum	220.07	5.15E+08	1.01E+09	7.78E+07	8.69E+08
Std. Dev.	410.7989	1.54E+09	4.58E+09	6.73E+09	1.93E+09
Skewness	1.196264	0.748825	1.231642	1.306545	0.672046
Kurtosis	3.13244	2.118784	3.063853	3.696096	1.805867
Jarque-Bera	9.330317	4.906687	9.866745	11.88328	5.252876
Probability	0.009418	0.086006	0.007202	0.002628	0.072336
Sum	24708.93	8.34E+10	1.85371E+11	2.16275E+11	1.10E+11
Sum Sq. Dev	6412719	9.05E+19	7.98E+20	1.72E+21	1.42E+20
Observations	39	39	39	39	39

4.1.2 Correlation Analysis

The pair wise correlation matrix and Variance Inflation Factor method were employed to inspect for the degree of multicollinearity among the predictor variables. Multicollinearity exaggerates the variance of the parameter estimates causing wrong magnitudes of coefficient estimates (Gujarati, 2003). There is thus need to ensure a weak degree of correlation among the explanatory variables below 0.8 or VIF less than 20. Table 4 presented the pair wise correlation matrix. Table 4 revealed a strong degree of correlation between the variables. However a more formal test using the Variance Inflation Factor method was employed.

Table 4: Correlation Matrix

	lnpgdp	lnexpser	lnexpg	lnce	lngcf
lnpgdp	1.0000				
lnexpser	0.8542	1.0000			
lnexpg	0.9146	0.9371	1.0000		
lnce	0.7851	0.9112	0.9204	1.0000	
lngcf	0.9856	0.8866	0.9332	0.8185	1.0000

4.1.3 Unit Root Test

This study employed the Phillips-Perron test to test the stationarity of the variables. Phillips-Perron test is preferred over ADF as it is able to resolve the problem of serial correlation. The null hypothesis postulates that a unit root exist and thus the variable is non-stationary. Table 5 shows the stationarity test results of the variables selected for this study. Unit root test result indicates that the variables become stationary at first difference. Since all the five variables are integrated of order one, we can run Johansen Test of Cointegration and if we confirm cointegration among the variables then we fit VECM. However, if the test reveals no cointegration variables then we fit unrestricted VAR.

Table 5: Unit root test

Variable	**Calculated test statistic**	**Critical values**			**Stationarity status**
		1%	5%	10%	
Lnpgdp	3.272	-3.662	-2.964	-2.614	I (1)
Lnexpser	-0.774	-3.662	-2.964	-2.614	I (1)
Lnce	-0.562	-3.662	-2.964	-2.614	I (1)
Lngcf	0.564	-3.662	-2.964	-2.614	I (1)
Lnexpg	0.086	-3.662	-2.964	-2.614	I (1)

4.1.4 Lag selection criterion

Determination of the optimal lag length is very essential in time series analysis. The results for the lag order selection criteria in the Table 6 shows an optimal lag length of 4 as evidenced by the significance under the HQIC and AIC selection criteria.

Table 6: Lag selection

Selection-order criteria
Sample: 1984 - 2018 Number of obs = 35

lag	LL	LR	df	p	FPE	AIC	HQIC	SBIC
0	-37.9677				8.0e-06	2.4553	2.532	2.67749
1	92.9453	261.83	25	0.000	1.9e-08	-3.59687	-3.13667	-2.26372*
2	111.1	36.31	25	0.067	3.1e-08	-3.20573	-2.36202	-.761611
3	146.823	71.446	25	0.000	2.2e-08	-3.81846	-2.59125	-.263379
4	196.949	100.25*	25	0.000	9.1e-09*	-5.25422*	-3.64351*	-.588179

After establishing the optimal lag length and maximum order of integration, cointegration test is conducted.

4.1.5 Johansen test for Cointegration

At maximum rank zero, the null and alternative hypotheses are as follows:

- **Null hypothesis:** There is no cointegration.
- **Alternative hypothesis:** There is cointegration

At maximum rank zero, the trace statistic (104.05) is greater than critical values (68.52). Therefore we reject the null hypothesis so that the variables are cointegrated. Similarly, for max statistics, the value 50.53 is greater than a critical value of 33.46; we reject the null hypothesis. Hence, as per maximum rank zero, the five variables are cointegrated. The Johansen test confirms that a cointegration relationship exist between the variable lnpgdp, lnce, lngcf, lnexpser and lnexpg. The existence of co-integrating vector indicates the

presence of long run link between them and that some type of causality therefore exists between them.

Table 7: Johansen test for cointegration

Johansen tests for cointegration

Trend: constant — Number of obs = 35
Sample: 1984 - 2018 — Lags = 4

maximum rank	parms	LL	eigenvalue	trace statistic	5% critical value
0	80	144.92282	.	104.0522	68.52
1	89	170.18866	0.76396	53.5205	47.21
2	96	182.21588	0.49705	29.4661*	29.68
3	101	190.48277	0.37649	12.9323	15.41
4	104	195.07059	0.23061	3.7566	3.76
5	105	196.94891	0.10177		

maximum rank	parms	LL	eigenvalue	max statistic	5% critical value
0	80	144.92282	.	50.5317	33.46
1	89	170.18866	0.76396	24.0544	27.07
2	96	182.21588	0.49705	16.5338	20.97
3	101	190.48277	0.37649	9.1756	14.07
4	104	195.07059	0.23061	3.7566	3.76
5	105	196.94891	0.10177		

4.1.6 Vector error correction model

Having determined that cointegration is present among the variables we estimate an error correction model to determine their relationship as suggested by Engel and Granger. VECM shows both the short run and long run relationship between variables. Table 8 illustrates that the error correction term (C1) is negative and the probability is less than 5% satisfying both conditions for presence of a long run relationship between the variables. Therefore a long run relationship exists between Gross capital formation, Compensation of employees, Service exports and Export of goods and GDP per capita. To investigate the short run relationship we examine individual lag coefficients and p values, if the p values are less than 5% level of significance then a short run relationship exists between the variables. The

findings reveal that there is a short run relationship between gross capital formation (p=0.000) and service exports (p=0.046) with GDP per capita. There was no short run association between per capita GDP, export of goods and compensation of employees.

Table 8: Vector Error Correction model

Dependent variable - D_lnpgdp				
	Coefficient	Standard error	t-stat	Probability
C1	-0.6048506	0.1979194	-3.06	0.002
D_lnpgdp	-1.356837	0.4405844	-3.08	0.002
D_lngcf	0.8946475	0.222721	4.02	0.000
D_lnce	0.522282	0.433377	1.21	0.228
D_lnexpg	-0.2021352	0.2020731	-1.00	0.317
D_lnexpser	0.2787433	0.1399289	1.99	0.046
Constant	0.037513	0.032055	1.17	0.242

4.1.7 Granger causality test

VECM will show the presence of both short run and long run relationship between the variables but not the direction of causality. Granger causality test has been employed in this study to investigate whether service exports cab be useful in forecasting the per capita GDP in Kenya in the future. We use the Toda and Yamamoto augmented granger causality test to overcome the problem of lag selection. This test suggests that we test Var (dmax+k) where dmak is the order of integration of the data in our case dmax=1 and k is the optimal lag order selected which we found to be 4. Therefore we estimate Var (4+1)

The null and alternative hypotheses are as follows

- **Null hypothesis:** variable x does not granger cause variable y
- **Alternative hypothesis:** variable x granger causes variable y

We reject the null hypothesis if p value is less than 5% and accept the alternative.

The results in table 9 below the statistically significant p-values indicate that previous values of gross capital formation, compensation of employees and export of goods granger causes per capita GDP and also vice versa therefore there exists bidirectional causality between gross capital formation, compensation of employees and export of goods with GDP per capita and only previous values of service export granger cause per capita GDP indicating a one-directional causality from Service exports to GDP per capita.

Table 9: Granger Causality

Equation	Excluded	chi2	df	Prob > chi2
lngcf	lnpgdp	12.465	5	0.029
lngcf	lnce	20.534	5	0.001
lngcf	lnexpg	45.433	5	0.000
lngcf	lnexpser	60.895	5	0.000
lngcf	ALL	209.1	20	0.000
lnpgdp	lngcf	23.851	5	0.000
lnpgdp	lnce	27.69	5	0.000
lnpgdp	lnexpg	17.738	5	0.003
lnpgdp	lnexpser	25.641	5	0.000
lnpgdp	ALL	120.82	20	0.000
lnce	lngcf	69.727	5	0.000
lnce	lnpgdp	113.23	5	0.000
lnce	lnexpg	27.492	5	0.000
lnce	lnexpser	25.563	5	0.000
lnce	ALL	366.27	20	0.000
lnexpg	lngcf	38.758	5	0.000
lnexpg	lnpgdp	20.568	5	0.001
lnexpg	lnce	60.28	5	0.000
lnexpg	lnexpser	43.059	5	0.000
lnexpg	ALL	172	20	0.000
lnexpser	lngcf	15.406	5	0.009
lnexpser	lnpgdp	10.715	5	0.057
lnexpser	lnce	51.343	5	0.000
lnexpser	lnexpg	42.205	5	0.000
lnexpser	ALL	282.22	20	0.000

4.2 Discussion of Results

The results of the phillip-perron test prove that the variables being considered were non-stationary at levels and become stationary after the first difference. Johansen cointegration test indicated that there was a stable long run equilibrium relationship between the independent and dependent variables and by using VECM we conclude that service exports and gross capital formation had a short run relationship with economic growth while exports of goods and compensation of employees did show any kind of short run relationship with economic growth. This can be referred to the fact that exports of goods

are faced by customs tariffs and other taxes enforced on merchandise trade that can be easily overcome in the long run. The results of Toda and Yamamoto granger causality test indicate that a bi-directional causality exists between export of goods and economic growth, gross capital formation and economic growth and compensation of employees and economic growth, while only unidirectional causality from service exports to economic growth exists. This paper finds strong proof of export led growth in both goods and services in Kenya. The possible explanation to prove Service-exports led growth in Kenya could be found in the structure of service exports. Growth in the service sector has an immediate effect on other sectors through various linkages, for instance most sectors depend on services for movement of commodities from one place to another therefore expansion of service sector implies growth in others and hence economic growth. Kenya is also a net exporter of services within the EAC and even globally and the surplus of service trade can be essential in importing capital goods and other inputs necessary for production, hence service exports through generating surplus can be a driver of economic growth.

4.3 Diagnostic Tests

This study undertakes various forms of diagnostic tests so as to investigate statistical feasiblity of the results.

Multicollinearity

Multicollinearity is when independent variables in the model are highly correlated with each other. Presence of multicollinearity makes the model results unstable and varies a lot given a small change in the model or data. We use VIF in this study to test for multicollinearity

Table 4 for VIF indicates the values of the explanatory variables in the study. Since the mean VIF of all the explanatory variables was found to be more than 10 and the highest VIF was less than 20, we concluded that multicollinearity was not a problem in this study.

Figure 3: Variance Inflation Factor

Variable	VIF	1/VIF
lnexpg	19.77	0.050586
lnexpser	9.89	0.101072
lngcf	8.87	0.112700
lnce	8.51	0.117488
Mean VIF	11.76	

Heteroscedasticity test

Heteroscedasticity is present when the variance of the error term is not constant across the values of explanatory variables. Presence of heteroscedasticity produces unreliable standard errors which will cause bias in the test results and confidence intervals.

To test for heteroscedasticity, the Breusch-Pagan test was employed. The error variances are constant under the null hypothesis of homoscedasticity. Table 10 presented the heteroscedasticity test results. Since the probability value of chi-squared was found to be greater than the alpha level of significance, that is; 0.1039 >0.05, we fail to reject the null hypothesis of homoscedasticity. We thus concluded that the model does not suffer from the problem of heteroscedasticity. Thus the estimated model is homoscedastic.

Table 10: Breusch-Pagan / Cook-Weisberg test for heteroscedasticity

Variables: fitted values of lnpgdp	
chi2(1) = 2.64	Prob > chi2 = 0.1039
Ho: Constant variance	

Autocorrelation test

Autocorrelation in time series is when a time series is linearly related to a lagged version of itself. Forecasting relies on the assumption that there is not autocorrelation between residuals. Presence of serial correlation can give misleading results about the fitness of the model.

In this study the test was performed on the residuals using the Breusch-Godfrey (BG) test.

Table 11: Breusch-Godfrey LM test for autocorrelation

Lags (p)	chi2	df	Prob > chi2
1	2.330	1	0.1004
H0: no serial correlation			

Source: stata computation

Since the probability value of chi-squared was found to be greater than the alpha level of significance, that is; 0.1004>0.05, then the null hypothesis of no serial correlation is not rejected (Breusch and Godfrey, 1979). There was no serial correlation problem of the residuals.

CHAPTER FIVE: SUMMARY, CONCLUSIONS AND POLICY IMPLICATIONS

5.1 Introduction

This chapter presents the summary of findings in the previous chapter, conclusions drawn from the study based on the findings and policy implications.

5.2 Summary of Empirical Findings

In this study all the variables were found to be are nonstationary at levels but become stationary at first difference. The Johannsen cointegration test found out that the variables were cointegrated suggesting that they exhibit a long run equilibrium relationship. The VECM results confirms that the variables had a long run relationship, the findings also suggested that there exists a short run relationship between, gross capital formation and service exports with GDP per capita while compensation of employees and export of goods did not show any short run relationship with per capita GDP. Toda and Yamamoto augmented granger causality was used to test causality among the variables. The test results indicate that bidirectional causality exists between gross capital formation, export of goods and compensation of employees with GDP per capita but only a unidirectional causality running from service exports to GDP per capita exists. Multicollinearity, heteroscedasticity and autocorrelation tests were carried out to test the viability of the analysis and were found not to be a problem.

5.3 Conclusion

The purpose of this study was to examine the link between service exports and economic growth and if such a link is found to exist analyze the causality between the variables. The study employed VECM and Toda and Yamamoto augmented granger causality tests to analyze this relationship. This test was preferred since it solves the problem of lag selection which Granger causality results have been seen to be sensitive to. The test involves testing VAR (dmax +k), where dmax is the order at which the data becomes stationary and k is the number of lag periods selected for the cointegration technique using VAR system.

The results of the study confirm that both short run and long run relationships between service exports and GDP per capita exist. They also suggest the existence of causality running from service exports to GDP per capita. The results are consistent with previous studies such as Dash and Parida (2012) and Priyankara (2018) which suggest presence of service export led growth. These results indicate that for the case of Kenya service exports positively stimulate economic performance both in the short-term and long-term and direct attention towards an alternative growth path. This is due to the growing significance of this sector in the economy and the rise of service exports over time. This may present an opportunity for Kenya to create a comparative advantage and grow their market. The results also show the need to encourage the production and export of services so as to increase the volume and the significance in the economy

5.4 Policy Implications

From the finding of the study, the increase in volume of service exports leads to higher economic growth, policy makers should therefore formulate policies to promote service exports in international trade in order to raise GDP growth such as availing information on

the markets for service exports and encouraging investment in this sector and providing support to acquire advance technology in industries producing services for exports which will boost the competitiveness of Kenyan services abroad and raise the volumes exported.

Based on the composition of service exports policy makers should implement precise policies so as to foster the service sector in Kenya. The government should take an active role to boost tourists confidence in the safety of the country so as to revive Kenya's position as a competitive tourist destination, improve infrastructure to the attraction sites and engage in bilateral treaty's to reduce administrative requirements to enter Kenya such as visas so as to encourage travel into Kenya and therefore increase tourism and travel related services.

Kenya as EAC financial and business hub shows great potential for Kenya's export of financial services like banking, insurance and other business services, the government should loosen regulations especially on investment of insurance funds, since trade in services is influenced by domestic regulations and international trade in services is susceptible to behind the border, national regulations that impact the supply of services, they should also train qualified personnel, improve infrastructure and foster more linkage so as to tap into this potential.

Kenya's telecommunications regulation has struggled to compete with the advancing market changes and emerging technologies, and the digital entrepreneurship space faces limited growth-aligned financing and a shortage of firm flow of digitally-skilled labour. Efforts should be made to reevaluate regulations concerning telecommunications, improve infrastructure, encourage FDI in this sector to improve access to financing for growth and acquisition of advanced technology and train personnel so as to acquire digital skills much needed to keep the pace with the rest of the world in a bid to increase the share of Kenya

transportation related and ICT services in world's service exports which Kenya has great potential in.

The government should facilitate access to foreign markets and give tax incentives to Kenyan firms so as to encourage their participation in export of services which will increase employment, improve quality of services delivered and increase competition among the firms. Kenya is seen to export business service in the EAC region, creation of mutual recognition agreements (MRA) of professional qualifications such as engineering, architecture and accounting could go a long way to increase services exported to this region.

From the positive contribution of service trade to the economy and trade it is therefore essential to strengthen and facilitate export of services. It is critical to create and implement a service guided development strategy supported by an extensive policy framework since according to the World Bank, 2016 performance in the service sector can imply the difference between rapid or slow growth.

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