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The Driving Forces of the Service Sector of the Ghanaian Economy

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ABSTRACT

The service sector in Ghana over the years has seen a tremendous growth, displacing both the agricultural and industrial sectors. Thus it is fitting to examine what drives this growth in the service sector of Ghana and also determine which of the sub-sectors is more potent. To achieve this, two models were specified. The method of Ordinary Least Squares estimation technique was employed to determine the potency of the service sub-sectors (transport and communication, tourism, financial institutions, health and education) and also to determine the contributions and impact of some macroeconomic variables (labour force, capital, real gross domestic product, service export and service import) on service output in Ghana. The study findings that financial institutions are the sub-sector that drives service output in Ghana. Also labour force and real gross domestic product per capita were determined as the key macroeconomic variables that drive the service sector growth in Ghana. Based on this, the study recommends that more investment be made in such areas.

Introduction

Production is the process and method used to transform tangible inputs (raw materials, semi-finished goods ,sub-assemblies) and intangible inputs (ideas, information, knowledge) into goods and services (Mohanty and Lakhe, 2001). Resources are used in this process to create an output that is suitable for uses or has exchange value. It is however, the act of creating use (value) or utility that can satisfy a want or need. The act may or may not include factors of production other than labour (Kaboski, 2000). Production process can be categorized into three main sectors, viz: the primary sector, secondary sector, and the tertiary sector. The primary sector involves the extraction of resources directly from the earth, this includes agricultural and resource extraction industries. In these industries, the product (that is, focus of production) is a natural resource. The various industries found in this sector include mining, agriculture, forestry, and fishing. The secondary sector involves the processing of raw materials from primary industries and includes the industries that produce a finished, tangible product (construction, manufacturing).The tertiary sector is the group that is involved in the provision of services, they include teachers, managers, research and development and other service providers (Mohanty and Lakhe, 2001).

The service sector of the Ghanaian economy currently has been doing very well by overtaking the backbone of the Ghanaian economy-- the agricultural sector. In recent times, the service sector seems to be the key driver of several economies, even more so with technological growth and globalization. In Europe, Asia, Africa and the other continents, the service sector has proven to be a key contributor to GDP (Angus, 2003). In India for instance, the service sector has appeared as fastest growing sector. It is noted that within the space of fifteen years, after the sector recorded a low growth, it grew at an unusually remarkable rate (Einchengreen and Poonam, 2009). The Chinese economy is no exception. The economy is also growing steadily with the service sector playing an important role with substantial increase in its contribution to GDP. The non- manufacturing activities now cover a large percentage of the economy whiles the manufacturing sector covers about 45 percent; and the remaining percentage going to agriculture. Consequently, China is diversifying its economy from the heavy dominance of the industry, manufacturing and investment in infrastructure, which for decades were the driving forces of China`s economic growth, to a more productive growth by raising the share of activity generated by the service sector especially in areas of logistics, tourism, engineering, healthcare and information technology (SENER, 2013). Again, Britain and the U.S

have a vast array of services which makes up about 80 percent of their economy and thus can explain the much given attention the service sector has been enjoying (IFPRI, 2012). Finally, in Africa, countries such as South-Africa, Nigeria, Egypt, Seychelles and many more, including Ghana, have experienced remarkable growth in their services sector.

In the past years (in the 1990`s), the service sector of Ghana contributed little to GDP at a steady rate. At that time, the agricultural sector was known for its dominance followed by the service sector and the industry. With time, the service sector has seen incredible performance, notably the remarkable growth in 2010 (IFPRI, 2012).

The performance of the service sector since 2010, has almost doubled the contribution of the much cherished sector (Agricultural Sector) in two consecutive years (2010 and 2011).The service sector is now the largest contributor to GDP in Ghana. As at 2012, it contributed about 50.0 percent to GDP, with the industrial and the agricultural sectors contributing 27.3 and 22.7 percent respectively to GDP (IFPRI, 2012).

The main sub-sectors of the service sector in Ghana include; Trade and Repair of vehicles, Households and Goods, Hotels and Restaurants, Transport and Storage, Information and Communication, Financial Intermediation, Business, Real estate and Public Administration and Defense; Social Security, Education, Health and Social Work, Community, Social and Personal. The contributions of most of these sub-sectors in recent times have been most impressive and have aroused interests of experts to examine the service sector more critically; to see how much contributions these sub-sectors have made to the Ghanaian economy, which macroeconomic factors influence the impressive performance of the services sector, whether their performances have been consistent over the years; and to find out which of the sub-sectors are key to the impressive performance of the service sector; hence the topic "the driving forces of the service sector in the Ghanaian economy".

The objectives of the study are:

- to determine the contributions of transport and communication, tourism, financial institutions, health and education and their impacts on service output in Ghana from 1990-2009.
- to determine the contributions and impact of labour force, capital, real gross domestic product, service export and service import on service output in Ghana from 1981-2013.

THEORITICAL LITERATURE REVIEW

The Three Sector Hypothesis

The three sector hypothesis which was divides the economies into three sectors of activity, that is, extraction of raw materials (primary), manufacturing (secondary), and services (tertiary). According to the hypothesis, the main focus of an economic activity shifts from the primary, through the secondary, and finally the tertiary sector. Clark et al (2000) saw the process as essentially positive. In the 'Great Hope of the Twentieth Century', he wrote that, the increase in the quality of life, social security, blossoming of education and culture, higher levels of qualifications, humanisation of work, and avoidance of unemployment countries with a low per capita income are in an early stage of development. This theory has it that the main part of their national income is achieved through production in the primary sector. Countries in a more advanced state of development, with a medium national income generate their income mostly in the secondary sector whereas in highly developed countries, with a high income, the tertiary sector dominates the total output of the economy.

In addition, the sector theory argues that over time the relative share of production in each major sector will change in the region. Due to the income elasticity of demand for primary, secondary, and tertiary products, the region becomes specialized in primary, secondary, and tertiary products. The income elasticity of demand for the products of different sectors drives the sectoral shifts in production. Increases in labour productivity support the changing sectoral allocation of the labour force. In addition, the theory has it that as per capita income increases, the demand for manufactured goods will exceed the demand for primary products. Consequently, the demand for services predominates and the service sector becomes the largest regional sector.

Sector theory focuses on the internal structure of the economy. Internal development through specialization and division of labour paves the way for favourable external trading relationships. Thus, internal development leads to external development. Unfortunately, the sector theory is too primitive to be used as a strategy for encouraging economic growth. Sectors must be examined at a finer level. To use sector theory more effectively, the service sector might be divided into five (5) categories: distribution, trade, business services, education and health services and other public non-profit and consumer services and also, knowing how and to what extent macroeconomic policies influence services production is very necessary and sufficient for sustainable services sectoral growth and economic growth.

The Theory of Progression

The theory of progression states that as people's income increases, they begin to move away from the consumption of agricultural produce and industrial produce to service produce. This means that as people's income increases in an economy, their demand for service product increases. In several economies, they tend to follow a developmental progression that moves them away from a heavy reliance on agriculture and mining, to the development of manufacturing for example textiles, shipbuilding, and steel and so on to a more service based economic structure (Mohanty and Lakhe, 2001). Enu et al (2013), shares the same thought as the theory of progression and explained that the movement of countries from a heavy reliance on agriculture to a more service-based structure might happen because as per capita income increases, agriculture loses its primacy, giving way first to a rise in the industrial sector and then to a rise in the service sector. This explains (SENER, 2013), which has it that, in reference to past events, the manufacturing seemed to be more open to international trade and competition than services; however in recent times, due to dramatic reduction of cost and speed; and reliability and

improvement in the transportation of people and communication of information, the services sector now includes some of the most intense international competition.

Rostow's Stages of Growth

Rostow (1960), in his book, "The Stages of Economic Growth", identified five stages every economy pass through when it is growing. This include the traditional stage dominated by subsistent agriculture; The transitional and take-off stages which are both associated to industrialization; Drive to maturity when technological progress is key; and then finally, the age of high mass consumption, dominated by the service sector. According to Rostow, this last stage is where all transitions stops and service provision and consumption becomes the drivers of growth in an economy. Although it is quite difficult to relate to all five stages of growth of Rostow's in the real world, it is not out of place to mention that most countries have gone through some of these stages; and more importantly most developed countries of the world are at this stage where service sector is the main driver of growth--exactly what Rostow predicted during the age of mass consumption.

The Structural Change Model

One of the notable theories here is that propounded by Chenery et al (1979). According to them, in a study of the developing countries during the post war periods, different countries experience common development patterns; these include the shift from agricultural to industrial production, the steady accumulation of physical and human capital, changes in consumer demands from emphasis on food and basic necessities to desires for diverse manufactured goods and services. In addition, families replace child quantity with child quality (education)
Chenery et al (1979) as quoted by Todaro and Smith (2009).

EMPIRICAL REVIEW

A lot has been said in literature regarding service sector growth and its effect on the economy as a whole. However considering the empirical studies done by other researchers using different forms of analytical tools, the effects of service sector growth on economic development differ, based on the kind of people, area of study, countries and even continent.
Beginning from the pioneering work of Clark (1940), Kuznets (1957), and Chenery (1960), evolution of sectoral shares in output, consumption and employment as economies grow have been studied for a long period. These studies attribute economic development as a three-stage process, wherein primary, secondary and services sector dominate the economic activity in that sequence. Analysis in terms of such stages of development, however, has been challenged in the recent literature, with the benefit of a richer a data than was available to Kuznets and Chenery.
For instance, Kongsamut et al. (2001) have analysed a sample of 123 countries for 1970-89 and found that rising per capita GDP in these economies is associated with an increase in services and as the economy matures, the sectoral share given up by the agricultural sector shifts more to the services sector and less to industry. In the context of economic development of nations, the structural change suggested by the development theorists has been movement from primary to secondary to tertiary sector activities. As the economy develops the share of primary sector contracts and the share of manufacturing expands, and only at a later stage, the share of services or tertiary sector activities expand.
Matsuyama (2000) point out that the growth of the ICT sector has led to the emergence of a "New Economy" in India, which has been a generator of new jobs for technical persons, and has been helping to earn foreign exchange through exports and attracting foreign investment. Though it is predominantly an urban activity in rural areas, the telecommunication segment of ICT does provide employment, and further, the wage level of the ICT workers is found to be higher than non-ICT workers.
Bhattacharya and Mitra (1989) stated that higher is the discrepancy between the industry and agriculture growth, the higher is the growth of services across Indian states, implying that higher levels of per capita income originating from industrialization led to higher demand for services.
Bhattacharya and Mitra (1997) based on their cross country analysis noted that trade openness did not have any significant effect on the relative size of the service sector in total employment though at the disaggregate level of this sector showed some positive effect. Presumably increasing international trade shifted workers from activities with a high incidence of low productivity component to more specialized commercial activities. Though in general, it is easy to analyse the shift in favour of the tertiary sector in the context of the developed countries as a standard transition of development theory (because following the rapid progress in industrialization the demand for several services grows faster, which in turn reduces the share of the secondary sector in the total product of the economy).In the case of the developing countries the dominance of the service sector before the secondary sector's relative size could outweigh that of other sectors did give rise to several concerns regarding this phenomena. Eichengreen and Gupta (2009) points out that the service sector's contribution to GDP has increased steadily over time and it has established itself as the largest sector of the Indian economy. While he notes the importance of some of the sub- sectors like transport in the context of growth and thus includes it in the secondary sector, he also shares the view that the growth of other subsectors like public administration and defence is neither necessarily related to the demand of the development process, nor is it related to the need for improvement in overall efficiency in a developing economy. However, after making price adjustments, his recalculations of the series did not really show that it expanded much faster than the GDP growth at constant prices. The rise in the share of this sub-sector in GDP reflected a rise in the cost of the services. Sub-sectors like transport, communication and banking did contribute significantly to the overall economic growth, and so also the IT enabled services (ITES), and business process outsourcing services (BPOS). Bhattacharya and Mitra (1997) found that the impact of per capita income on the percentage share of tertiary sector in total work force was positive, though it tended to stabilize at higher stages of development. Banga and Goldarxiii (2004) in the Indian context noted that the importance of services as an input to production in the manufacturing sector increased considerably in the nineties compared to the eighties. Economic policy changes in the nineties, particularly the trade reforms, created a condition

favourable for increased use of services in manufacturing. Gordon and Gupta (2004) attempts to find out whether India is an outlier in this case by using cross-country data on sectoral shares in GDP and fitting a trend line. It was found that the share of service sector in GDP is associated positively with per capita income, that is, the countries with higher per capita income also have a larger share of services in GDP. Kuznets (1953) concluded that the share of services in national product did not vary significantly with per capita income. Chenery (1960), when regressing the share of services on per capita income, found an insignificant coefficient on the latter, concluding that the relationship between services and per capita income is not uniform across countries. Chenery and Syrquin (1975) regressed the service-sector share of output on per capita income and per capita income squared, concluding that the relationship was concave to the origin – that it rose with per capita incomes but at a decelerating rate. Kongsamut, Rebelo and Xiao (1999) found, in contrast, the share of services in output to be linear in per capita income. Evidently, the conventional fact is not very clear. Jensen and Kletzer (2005), calculate the Gini Coefficient for the geographical dispersion of each activity and use it to identify tradable and non-tradable services. The underlying idea is that the services which are tradable can be geographically concentrated in order to reap the economies of scale. They also found wholesale trade to be having an almost equal score for tradability and non- tradability. Indicators for information and communication technology (ICT) industries were constructed using the data in van Ark, Inklaar and McGucken (2005). Lee and Kenneth (2006) regressed the growth rate of GDP on share of services in employment. They found negative and significant coefficient suggesting that relative increase of the services' share in employment is associated with a decline in the output growth rate. Shinghal et al. (2005) investigated on the topic 'Will Service be the new engine of Economic Growth in India?' Six different kinds of simple linear growth equations were estimated by them. They found that all the equations indicated high correlation between sectorial and overall growth. Unfortunately, only four of those equations relating to manufacturing and services respectively satisfactorily passed the various diagnostic tests.

Mikael and Mahmood (2007) studied the long run relationship between sectors' share and economic growth using panel data of Schengen region from the period 1970 to 2004. Their main objective was to analyse how sectors' shares are related to economic growth. They employed the product function, did dynamic econometric modelling, and used co-integration and error correction model and also conducted Granger causality test in panel setting. Their dependent variable was GDP capita growth rate and the independent variables were agriculture share as a percentage of GDP; industry share as a percentage of GDP and service share as a percentage of GDP. After their analysis of the panel data, they found out that the relationship between services share growth and growth rate of GDP per capita was bi-directional.

Einchengreen and Gupta (2009) did a study on: The positive association between the service sector share of output and per capita income in the U.S.A; which is one of the best-known regularities in all of growth and development economics. Yet there is less than complete agreement on the nature of that association. They identify two waves of service sector growth, a first wave in countries with relatively low levels of per capita GDP and a second wave in countries with higher per capita incomes. According to Sullivan (2002) the United States has undergone a transformation from an industrial society to the first post-industrial society. Consequently, the service sector has surpassed manufacturing in its contribution to the GNP and in employment. Sandhu and Mehta (2007) this study is examined that admittedly, in the happening world of today; the woman has become concertedly visible. She is treading every domain of activities with self- belief and proven competence. Her forays into the male monopoly of executive role in management affairs have registered a significant success in spite of so many constraints in her march to hierarchical positions.

Ramakrishna (2010) investigates the impact the service sector, industry, agriculture and the open policies had on India's economic growth. The study found that service sector appears to contribute more. According to the study, the sources of service sector growth in India appear to be income elasticity of demand, open policies and the growth in the service sectors like communications, business, banking and insurance and trade services.

Enu and Attah-Obeng (2013) looked at the effect of macroeconomic policies on services output in Ghana from the period 1980 to 2012. The method of the ordinary least squares estimation was used. GDP per capita was found to affect services output positively and was statistically significant. Government spending and inflation were found to negatively affect services production in Ghana. They were each statistically significant at the 5%. In view of these, they concluded that macroeconomic policies that enhance favourable economic expansion, ensure effective and efficient government spending and reduce the rate of inflation should be formulated and implement correctly to ensure the continual growth and development of the services sector and Ghana as a whole.

In conclusion, it can be seen from the empirical studies that, most of the research was based on the contributions of service sector output to GDP and its impact on the economy as a whole. However, these researchers have so far, not identified which of the subsectors is potent or key and also which other macroeconomic factors apart from GDP contribute to this impressive performance of the service sector. Thus there is a need for a research of this nature, to look into the performance of the key subsectors such as transport and communication, financial institutions, tourism, health and education, in addition to, some other macroeconomic determinants such as capital, labour force, real gross domestic product per capita, service export and service import contributing to the impressive performance of the services sector and its effect on the economy.

METHODOLOGY

Models Specification

The study is based on two separate regression models which cover a period 1981-2013 and 1990-2009 respectively. These models employ an empirical analysis of data, that is, regression analysis which refer to a statistical technique that describe the relationship among dependent and independent variables. The dependent variable of the models is Service Output (SQ).The explanatory variables for the first model are labor force, capital, gross domestic product per capita, service import and service export whereas the explanatory variables for the second model are transport and communication, tourism, financial institutions, health and education. The models are stated as follows;

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MODEL1

This model aims at establishing which sub-sector of the service sector is potent. In other words what sub-sector drives the service sector growth.
The model include:

$SQ = f(L, K, GDPPC, X, M)$….1
$SQ = cK^{b_1}L^{b_2}GDPPC^{b_3}X^{b_4}M^{b_5}$……..2
Taking the natural log of both sides of the equation (2) we obtain:
$lnSQ = lnC + b_1 \ln L + b_2 \ln K + b_3 \ln GDPPC + b_4 \ln X + b_5 \ln M + \mu$…..3
Where,
SQ-Service Sector Output
L- Labor Force
K- Gross Fixed Capital Formation
GDPPC- Real Gross Domestic Product Per Capita
X- Service Export
M- Service Import.
μ- Error Term

MODEL2

This model is based on the premise that other macroeconomic variables might indirectly influence the growth in the service sector; other than just the sub-sectors of the service sector.
The model includes:

$SQ = f(TC, TRM, FIN, HE)$….1
$SQ = cTC^{b_1}TRM^{b_2}FIN^{b_3}HE^{b_4}$……..2
Taking the natural log of both sides of the equation (2) we obtain:
$lnSQ = lnC + b_1 \ln TC + b_2 \ln TRM + b_3 \ln FIN + b_4 \ln HE + \mu$…..3
Where,
TC- Transport and Communication
TRM- Tourism
FIN- Financial Institutions
HE- Health and Education
μ- error term

Justification of the Variables

Services Output
Service output (SQ) is the productive outputs of the marketing channel that end-users have demand and preference for. The SQs represent all of the aspects of an economy involved in rendering services. It is important to note that SQs do not involve the product itself. Service output is being used in this study as an independent variable.

Labor Force
According to ILO(2005), the total labor force comprises of people aged 15 and older who meet the International Labor Organization's definition of the economically active population, that is all people who supply labor for the production of goods and services. This means that the greater the number of labor supply, the higher production of goods and services. The classical economists such as David Ricardo and Thomas Malthus, the most important factor of production other than land are labor (Weil, 2005). Moreover they defined productivity as a function of labor, land and capita. Thus, it is expected that the explanatory variable, labor, would have a positive sign.

Capital
According to Weil (2005) physical capital is the object that extends our ability or do work for us. Capital includes not only the machines that sit but also the buildings in which we work infrastructure and vehicles. The Solow model, based around capital accumulation, explains some of the difference in per worker incomes across countries and also throws light on the difference in growth rates among countries. Between 1909 and 1949, the annual growth of total GDP was 2.9 percent per year. Of that, Solow concluded that 0.32 percent was attributable to capital accumulation. From the above, we can deduces and conclude that physical capital is expected to have a positive sign and impact on service output.

Real Gross Domestic Product per capita
Real GDP per capita is a measurement indicator of the standard of living of a country. Moreover, according to the law of progression, as people's income increases they begin to move away from the consumption of agriculture, and industry to a more service based structure (Mohanty and Lakhe, 2001) It measures real GDP to the population of a country. However, for this study, real GDP per capita is used since the explanatory variables are measured as a percent of GDP. Its impact depends on the magnitudes of household's consumption, planned investment spending by business firms, government spending and net export. The higher the magnitude of these variables, the higher output will be and thus an increase in service output.

Service Export
Service exports refer to the economic output of intangible commodities that may be produced, transferred outside a country and consumed at the same time. (ILO, 2005).Thus if a country exports more services outside the country than it imports; it is

likely to have a positive impact on service output and growth. Therefore, if a country exports more services, the output comes back into the economy and thus has a positive impact on service output and therefore, the coefficient is expected to have a positive sign.

Service Import

Service exports refer to the economic output of intangible commodities that may be produced, transferred into a country and consumed at the same time. (ILO, 2005).Thus if a country exports more services into the country than it exports, its impact on service output depends on how the services imported are used in the country. It can either have a positive or negative impact on service output.

Transport and Communication

Transport according to is the movement of people, animals, goods and service from one place to the other. Some modes of transportation include rail, road, water bodies, cables and what have you. Communication on the other hand is the transfer of information through verbal messages, the written words or more subtle, non-verbal words. These two variables put together play a big role in affecting service output. It is expected that transport and communication affect service output positively. They are being used as explanatory variables because they are subsectors of the service sector of the Ghanaian economy.

Tourism

According to Theobald (1994), tourism is the travel for recreation, leisure, family or business purposes usually of a limited duration. It is expected to have a positive impact on service output if much is offered from the country rendering the services. It is used as an explanatory variable because it is regarded as a subsector of the Ghanaian economy.

Financial Institutions

The financial institutions include finance, insurance, real estates and business services which are all subsectors of the service sector and is being used an explanatory variable to determine its impact on service output in Ghana. It is expected that financial institutions should have a positive impact on service output.

Health and Education

Health in this context is represented as health care, which is the diagnosis, treatment, and presentation of diseases illness injury and other physical and mental impairments in human beings. Education on the other hand is the imparting and acquiring of knowledge through teaching and learning, especially at a school or institution. They are both forms of rendering services. These are also key subsectors that are likely to impact service output in a positive way.

Method of Analysis

Ordinary least squares method, was be used to analyze this data. The time series showed the performance of the services sector of Ghana over the period of years. Therefore, one can forecast the performance of the services sector and determine the contributions to the economy. Here, there would be the need to test for the stationary of the variables, establish the long-run and the short-run relationship among the variables in order to avoid spurious results. But in this study, these tests will not be established. It would be left for higher studies.

The method of Regression analysis can show the relation (signs) and impact (size) of the subsectors and macroeconomic variables on service output. For the purpose of this study, the method of Ordinary Least Squares (OLS) was adopted, to determine the relationship and the impact of the macro-determinants and subsectors on service output.

Robustness Tests

The Coefficient of Determination (R^2)

This is aimed at the evaluation of the statistical reliability of the estimates of the parameter of the model, which we obtain from the sample of the variables. The square of correlation coefficient shows the percentage of the total variation of the dependent variable, that is, SQ or the extent to which the explanatory variables are responsible for changes in the dependent variable of the relationship which ranges from 0 to 1.However, if the value obtained is closer to zero, it means that the model does not fit the data very well (Johnston, 1972).

The P- Value for Each Explanatory Variable

The p-value for each explanatory variable was used to check whether each coefficient is significantly different from zero or not. Its value should be lower than 0.05. If each explanatory variable of the models has a p-value inferior to the 0.05 critical values, then it confirms that all the explanatory variables have a significant impact upon the dependent variable. To quickly judge whether the models exhibited the problem of multicollinearity, the P-values were used. If the parameter estimates prove to be statistically significant, then it will mean that the problem of multicollinearity does not exist. (Enu, 2014).

The Global Significance Test

The global significance test was used to test if all the model coefficients were significantly different from zero. If the p-value for the global significance test is lower than the 0.05 critical value, then it means that all the explanatory variables included in the model have a statistically significant impact on the dependent variable or otherwise. That is, the overall multiple regression equation and the parameters estimates are statistically significant and the regression line performs well (Ewusi 2013)

Multi collinearity

Muti collinearity was used to denote the presence of linear relationships or nonlinear relationships among explanatory variables. If the explanatory variables are perfectly linearly correlated, that is, if the correlation coefficient for these variables is equal to unity, the parameters become indeterminate. It is impossible to obtain numerical values for each parameter separate-

ly and the method of least squares breaks down. On the other hand, if the explanatory variables is equal to zero, the variables are termed orthogonal and therefore, there is no need to perform regression analysis (Cohen, 1971).

Multi collinearity and Variance Inflation Factor (VIF)

To further test for presence of collinearity, the VIF was also used. With the benchmark of 10, the rule of thumb is to reject the hypothesis of no multicollinearity if the VIF of the each independent variable is greater than 10 (Damodar and Porter, 2008).

Autocorrelation Test

Durbin Watson Statistic (DW)

The DW test was used to test for the presence of autocorrelation. The traditional benchmark is 2.0. If DW value lies between 1.5 - 2.5 it means the assumption of non-autocorrelation is not violated.

Durbin Watson (DW) and R-Squared (R^2)

According to Granger and Newbold, as quoted by Enu (2014), if the value of the R-squared is greater than the value of the DW (R^2> DW), then there is a good rule of thumb to suspect that the estimated regression is spurious. The R^2 and the t-statistic from such a spurious regression are misleading, and the t-statistics are not distributed as t distribution and, therefore, cannot be used for testing hypotheses about the parameters.

Heteroscadascity

When the assumption of homoscedasticity is violated it shows the presence of heteroscedasticity. The assumption of homoscedasticity means a constant variance of μ's. If not satisfied in any case, then there exist heteroscedasticity. Heteroscedasticity can be solved by the deflation of the variables and transforming them into logs (Goldfield and Quandt, 1965). Thus the use of log model takes care of problem of heteroscadasticity in this study.

Table 5: Variables and Source of Data

VARIABLE	SOURCE OF DATA
Service Output	World Development Indicators
Labour Force	World Development Indicators
Gross Fixed Capital Formation	World Development Indicators
Real Gross Domestic Product Per Capita	World Development Indicators
Service Export	World Development Indicators
Service Import	World Development Indicators
Transport And Communication	State Of The Ghanaian Economy
Tourism	State Of The Ghanaian Economy
Financial Institutions	State Of The Ghanaian Economy
Education	State Of The Ghanaian Economy

DISCUSSION OF RESULTS

Model 1

Which sub-sector is more potent?

Dependent Variable: Services Output

Variable	Coefficient	Std. Error	t-statistic	p-value	VIF
Constant	0.0329681	0.410158	0.0804	0.93700	
l_TC	0.254183	0.252468	1.0068	0.33000	2.056
l_TRM	-0.141707	0.108376	-1.3075	0.21071	2.056
l_FIN	0.423493	0.124473	3.4023	0.00394	1.993
l_HE	0.415911	0.106681	3.8987	0.00143	2.713

Standard error of residuals = 0.162528; Unadjusted R^2 = 0.76018; Adjusted R^2 = 0.69623; F-statistic (4, 15) = 11.8866 (p-value = 0.00015); Durbin-Watson statistic = 2.52751

From the output, about 76% of the variation in the dependent variable was accounted for by the independent variables. This is supported by the F statistic. It shows the overall regression model is significant with an F value of 11.8866 and a p- value of 0.00015 which can be read from the regression output. Moreover, there was no problem of autocorrelation given a Durbin-Watson value of 2.52751> R^2. Again, the problem of heteroscadascity is not an issue since the model is in log form. Finally, the variance inflation factor of the variables shows that there was no presence of multi collinearity.

On the explanatory variables, transport and communication, financial institutions; and Health and education all have a positive sign as expected. However, Tourism has a negative sign contrary to expectation.

The above estimation shows that as expected, transport and communication has a positive impact on service output. Specifically, ceteris paribus, a 1% increase in transport and communication will lead to about a 25% increase in services output. However, this impact is not statistically significant at 5% level; thus transport and communication did not play a significant

role in the service sector growth within the considered period. However, given that the expected sign was achieved means that if more attention is given to transport and communication, it would boost the performance of services in Ghana.

In addition, as expected, the results show clearly that service output and financial institutions are positively related. Specifically, a 1% increase in financial institutions would cause service output to increase by about 42%. And this impact is significant at 5% level. It can therefore be said comfortably that the performance of financial institutions in Ghana has a great positive impact on services output.

Moreover, the results show that health and education, indeed, has a positive impact on service output in the Ghanaian economy. The coefficient of health and education shows that a 1% increase in health and education will lead to about 41% increase in service output; and this is significant at 5% level. This implies that health and education is one the main subsectors that drives the service sector growth.

Finally, Tourism had a negative sign which implies that tourism has a negative impact on service output in Ghana. In other words, an increase in tourism will cause service output to decrease. Specifically, a 1% increase in tourism will lead to about 14% decrease in service output. However, this impact is not significant at 5% level. This result tells that, although tourism is a subsector of the service sector, its impact on service output is very minimal and cannot be said to be a potent subsector to service sector.

In the light of the above discussion, although transport and communication had a positive impact on service output it was not significant. This means that transport and communication does not have a strong positive impact on service output and thus cannot be said to be a major contributor to service output. Tourism on the other hand, was found to have a negative relationship with service output in Ghana and can also not be said to be a major contributor to service output and for that matter a key driving force of the service sector of Ghana. However, financial institutions, health and education were found to have a positive impact on service output and also significant. Thus we can comfortably conclude that although the chosen variables are subsectors of the service sector of the Ghanaian economy; financial institutions, health and education have proved to be the key drivers of the service sector growth in Ghana.

Model 2

Which Macroeconomic Variables Influence the Services sector of the Ghanaian Economy?

Dependent Variable: Services Output

Variable	**Coefficient**	**Std. Error**	**t-statistic**	**p-value**
Constant	-10.4388	2.13367	-4.8924	0.00014
l_ L	0.734812	0.209292	3.5109	0.00268
l_GFCF	-0.241273	0.0669768	-3.6023	0.00220
l_GDPPC	0.759817	0.169142	4.4922	0.00032
l_M	-0.207532	0.118826	-1.7465	0.09876
l_X	-0.238909	0.0680546	-3.5106	0.00268

Standard error of residuals = 1.1576; Unadjusted R^2 = 0.98976; Adjusted R^2 = 0.98674; F-statistic (5, 17) = 328.507 (p-value < 0.00001); Durbin-Watson statistic = 2.05354

From the output, about 98% of the variation in the dependent variable was accounted for by the independent variables. This is supported by the F statistic. It shows the overall regression model is significant with an F value of 328.507 and a p-value of 0.00001. Moreover, the problem of autocorrelation given a Durbin-Watson value of 2.05354. Moreover heteroscadascity was not present in the regression model since the log values of the variables were used.

On the explanatory variables, GDP per capita, labour force and service import all have the expected signs. However, physical capital and service export have negative signs, contrary to expectation.

The above estimation shows that as expected, labour force has a positive impact on service output. Specifically, ceteris paribus, a 1% labour force will lead to a 73% increase in services output. This impact is also statistically significant at 5% level; this implies that the labour force of the Ghanaian economy has a great influence on the provision of services in the economy and therefore, a key macroeconomic determinant of service output in Ghana.

In addition, as expected, from the results, real gross domestic product per capita has a positive impact on service output. In other words, an increase in real gross domestic output will cause an increase in service output. Specifically, a 1% increase in real gross domestic product will lead to about 75% increase in service output. And this impact was also significant at 5% level. This means that the standard of living of Ghanaians is key to driving the growth in the service sector; clearly proving the law of progression; which states that as people's income increases, they gradually move away from agriculture to more service based economy.

Moreover, the result above shows that on the contrary, capital has a negative relationship with service output; indicating that an increase in capital will cause service output to decrease. Specifically, a 1% increase in capital will lead to 24% fall in service output. This impact is also significant at 5% level. Thus physical capital was definitely not a macroeconomic driver of the service sector. This could well be because of the use of old machinery as a means of production in Ghana, leading

to capital inefficiency. This result is consistent with a study by Brasoveanu et al. (2008) on Correlations between capital market development and economic growth - a case study of Romania.

Again from the result, contrary to expectation, service exports have a negative impact on service output in Ghana. In other words, an increase in tourism will cause service output to decrease. Specifically, a 1% increase in tourism will lead to more than 20% decrease in service output. And this impact is significant at 5% level. This shows that service export is currently not a significant macro-determinant to service output in Ghana. This means that when Ghana exports its services outside the country, benefits stay in the foreign country rather than coming back into the country; this is especially associated with the brain drain phenomenon.

Finally, service import is also another macroeconomic determinant of service output. The impact of service import depends on how imported services are utilised in the country. From the estimated results, service import has a negative impact on service output in Ghana, as expected. Specifically, a 1% increase in service import will lead to more 20% decrease in service output. This impact is also significant at 5% level. This result means that if more foreign services are imported into the country, service output is likely to be low.

The study has successfully identified financial institutions and; health and education as the potent subsectors of the service sector. It also identified key macroeconomic determinants of services output in Ghana as the labour force and real gross domestic product per capita. Therefore, they can be said to be, currently, the driving forces of services sector of the Ghanaian economy.

Summary

This research paper was designed to investigate the contributions and impact of the subsectors of the service sector; and also to identify the macroeconomic determinants of service output and their impacts. Secondary data and information was collected from various institutions associated with the services sector and analyzed by the use of the Ordinary Least Squares method. It was found that financial institutions; and health and education are the key subsectors that drive the service sector to its impressive performance in Ghana currently. In other words, financial institutions; and health and education impact the services output of the Ghanaian economy greatly. Transport and communication on the other hand has a positive relationship with services output but the impact it has on services output is not significant. It was also found out that tourism has a negative impact on services output in the Ghanaian economy. In terms of the macroeconomic determinants, the labour force and real gross domestic product were established as the main macro-contributors to service output in Ghana, whereas capital, service export and service import have a negative impact on service output.

Based on these findings the following policies are recommended:

1. Given the role played by the financial institutions, health and education to service output and the economy as a whole, there is the need for an expansion and improvement in these subsectors to help keep up the impressive performance of services in recent times. The Ministry Of Education should improve the education system by the renovation of old school buildings, provision of educational subsidies and all other policies that can improve and maintain education in Ghana. The Ministry of Health should also consider the establishment of new hospitals and offer more education on the health of the citizens.
2. Transport and Communications has a positive impact on service output but its impact was not significant to services output in Ghana. The researcher strongly believes that an improvement in transportation especially, our roads; and a decrease of importation of network providers from other countries can help improve the transport and communication subsector. The government can do this by training more people to provide communication services rather than importing such services.
3. Government should focus on improving real gross domestic product per capita and labour since these factors are major determinants of service output in Ghana. Thus an improvement in the living standards of the citizens should be the main focus of the government in its attempt to increase and maintain the performance of services output. The government should also ensure quality training of labour and creating more jobs in order to expand the labour force.
4. Capital proved to contribute insignificantly to service output and has a negative impact on service output. This means that the kinds of machinery available in the country, infrastructure and other forms of capital that enhance the ability to work is not in good shape and as a result is causing capital to impact services output negatively. The government and other stakeholders should therefore improve on the quality of captal.
5. The number of service import should be decreased; this way, these services would stay in the country and the economy would benefit. Also, service exports should be reduced by the provision of more lucrative jobs to encourage citizens to stay rather leaves Ghana to work. This can help sustain the impressive performance of the service sector of Ghana.
6. From the analysis of this research, it came out that the tourism sub-sector does not have a positive impact on service and is insignificant to the growth of the service sector; nonetheless, the researcher believes that tourism is key to growth in service output, if properly managed. Thus there is a need for the Ghanaian government and all stakeholders to build up the tourism sub-sector which is likely to attract more tourists and investors into the country.

Conclusion

In conclusion, the study reviewed the performance of transport and communication, tourism, financial institutions, health and education and their contributions and impacts on service output in Ghana from 1990-2009 using regression analysis.

The research also determined the performance of labour force, capital, real gross domestic product, service export and service import and their contributions and impact on service output in Ghana from 1981-2013 using the Ordinary Least Squares

Method. Further tests carried out revealed that there was no econometric problem of multi collinearity, autocorrelation and heteroscedasticity on the explanatory variables. It was found that financial institutions; health and education, labour force and real gross domestic product were established as the main driving forces of the service sector in Ghana currently.

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