

Effect of Macroeconomic Policies on Services Production in Ghana (1980–2012)

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Abstract

The study 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. The model was free from multicollinearity, autocorrelation and heteroscedasticity problems. GDP per capita was found to affect services output positively and it was statistically significant. Government spending and public enemy number one, which is inflation were found to negatively affect services production in Ghana. They were each statistically significant at the 5% significance level. In view of these, 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.

Keywords: Macroeconomic Environment, Services Output, Ghana

Introduction

The study identifies the effect of macroeconomic policies on services production in Ghana. The estimation technique employed is the ordinary least squares estimation technique. The study is from the period 1980 to 2012.

The driving force of an economy heavily depends on the services sector of that economy apart from the contributions that emerge from the industry and agriculture sectors. This is because an effective and efficient growth in the services sector of a particular country, leads to economic growth and development of that nation for which Ghana cannot be excluded. In addition, the sector supports the primary and secondary sectors by providing an enabling environment for the product and factor markets to function more effectively and efficiently (the State of the Ghanaian Economy, 2004).

Service sector is the portion of the economy that produces intangible goods. The focus is on people interacting with people and servicing the customer rather than transforming physical goods. The service sector is also called the tertiary sector. Examples of the tertiary industries, in general, may include government, telecommunication, hospitality/tourism industry, mass media, health care/hospitals, public health, information technology, waste disposal, financial services (banking, insurance, investment management), professional services (accounting,

legal services, management consulting), consulting, gambling, retail sales, franchising, real estate, education, hotels, social work, transport, computer services, and recreation.

According to the theory of progression, countries tend to follow a developmental pattern that takes them from a heavy reliance on agriculture and mining, toward the development of manufacturing and then finally toward a more service-based structure. This 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. Such is the kind of situation that Ghana finds herself in since the year 2006 though she is still in the process of industrializing (see figure 1 below). So, identifying and knowing how and to what extent macroeconomic environment affect services production in Ghana is very timely.

The real GDP growth rate of the Ghanaian economy in 2007 was 6.46%, which further increased to 8.43%. In 2009, there was a sharp decrease in the real GDP growth rate to 3.99%. From 2010 to 2012, the real GDP growth rates were 7.7%, 14.4% and 7.2% respectively. The strongest performance came from the services sector, which grew at a rate of 10.2%. This was followed by the industrial sector, which grew by 7% in 2012. The agriculture sector still continues to perform badly (the State of the Ghanaian Economy (SGE), 2012).

The services sector of Ghana covers a range of tertiary activities. These include transport, storage and communication, wholesale and retail trade, tourism (restaurants and hotels, castles and forts, game parks, etc), finance, insurance, real estate and business services, government services (education, health, defence, etc), social and personal services, and producers of private non-profit services. These subsectors can be categorized into public service sector which includes educational services, health services, government and municipal services and cultural and religious services while the private service subsector includes commerce, professional and personal services, hotels and tourism, transport and communications, domestic and unspecified services (The State of the Ghanaian Economy (SGE), 1990). The longest branch of the service sector is wholesale, retail, hotels and restaurants and the most important is the transportation (which includes roads, airports and harbours) due to the introduction of metro mass transportation to some urban areas to ease traffic jams and improvement in urban transport systems.

The services sector remained the largest and strongest contributor to GDP with a share of about 46% averagely, from 1997 to 2012. Agriculture comes in second with approximately 40% while industry contributes about 29%. What have been the driving forces behind these impressive performances that the services sector has been experiencing since 2006 against the backdrop of the industrial and the agricultural sectors of the Ghanaian economy?

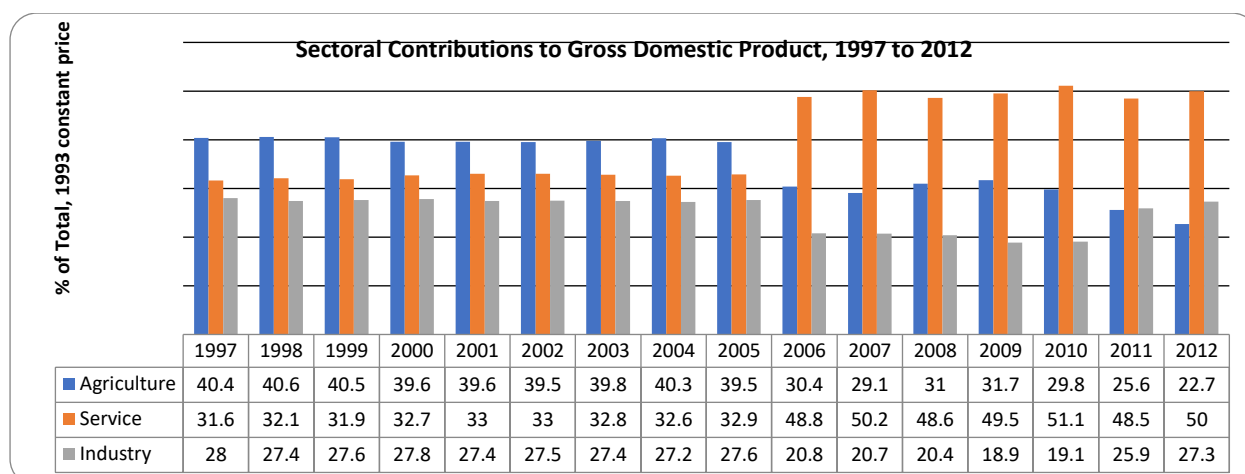


Figure 1: Sectoral Contributions to GDP, 1997 to 2012

Source: State of the Ghanaian economy (SGE), various issues

The various subsectors of the services sector, in terms of its share in total GDP has been trending upward, with the major contributions coming from government services (averaging about 9.7%), followed by wholesale and retail trade, restaurants and hotels (7.1%) and transport, storage and communication (5.1%) as can be seen from figure 2 below. Overall, these increases have led to an upward trend of the services sector’s contribution to total GDP since 2004. Apart from these drivers, which are the government services, wholesale and retail trade, restaurants and hotels and transport, storage and communication, which other economic factors are very responsible for these impressive and massive performances of the services sector of the Ghanaian economy as against the backdrop of the industrial and agricultural sectors of the Ghanaian economy?

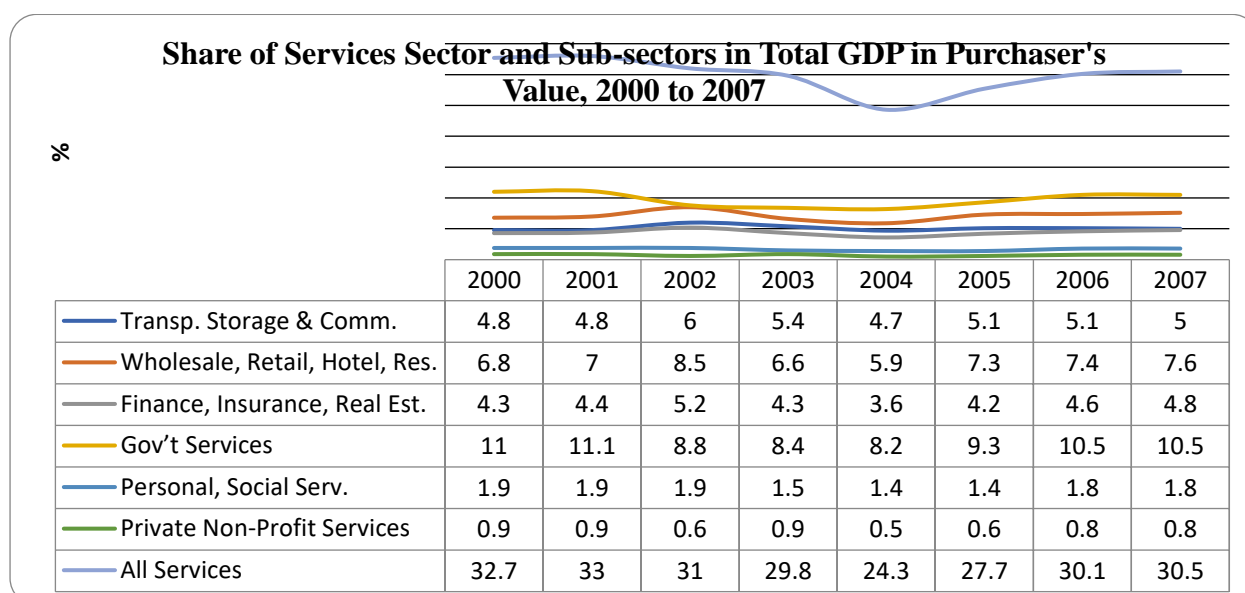


Figure 2: Share of Services Sector and Sub-sectors in Total GDP in Purchaser's Value (%), 2000–2007

Source: the State of the Ghanaian economy (SGE), various issues

The picture is clearer in terms of growth rates as shown below.

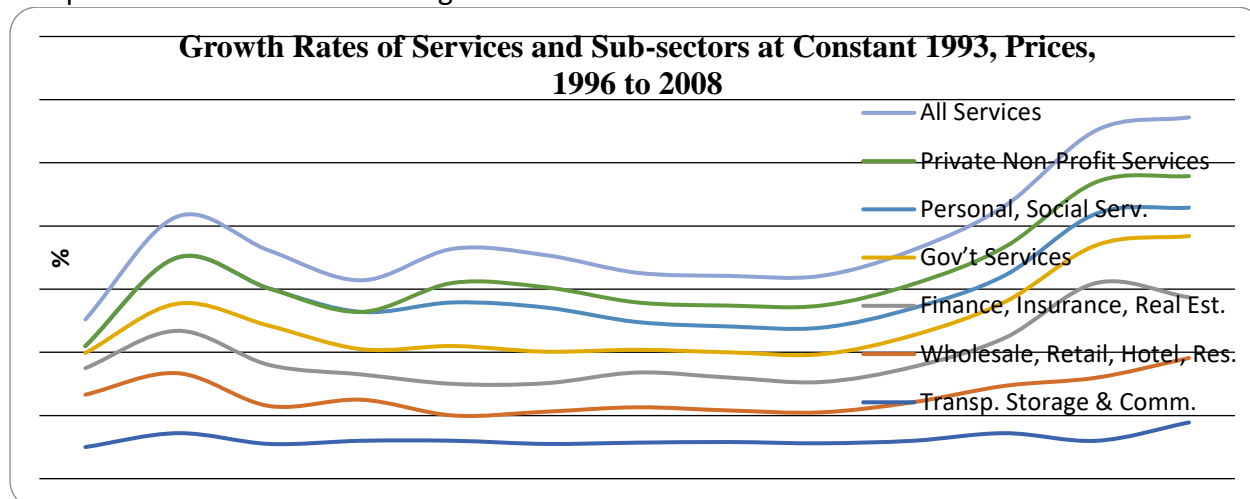


Figure 3: Growth Rates of Services and sub-sectors at Constant 1993, Prices, 1996 - 2008

Source: State of the Ghanaian Economy (SGE), various issues

Which macroeconomic factors are responsible for these impressive performances of the services sector of the Ghanaian economy?

The service sector as a whole accounts for an average of about 67% of recorded employment in Ghana of which transport and communications contribution is about 5% of recorded employment (the State of the Ghanaian Economy (SGE), 1990). According to the 2000 Population and Housing Census, about 31% of the economically active population is engaged in services, of which 15.3% in wholesale and retail trade, 3% in hotels and restaurants, 3.6% in transport, storage and communication, 0.6% in financial intermediation; and 8% in education, health, social work, personal services and community services. Education, health, housing, recreational and welfare services together offer the highest percentage employment in the service sector and account for about 47% of total employment in Ghana (SGE, 1990). Wholesale, retail, hotels and restaurants offers employment to about 6% of those gainfully employed in the Ghanaian economy (SGE, 1990). The Information and Communication Technology Services (ICT) sector has been a new source of employment in Ghana. Direct and indirect employment by telecommunications companies continues to increase, and the country's young IT-enabled services industry is already providing direct employment for some 2,500 people (SGE, 2007). The tourism industry provides direct and indirect employment to over 300,000 people (SGE, 1990). Direct employment from tourism rose from 33,094 in 2003 to 46,502 in 2004, with indirect and induced employment rising from 82,129 to 115,015 over the same period (SGE, 2005). The tourism sector provided direct jobs for almost 60,000 people and about 147,000 indirect jobs in 2007 (SGE, 2007).



Figure 4: Employment in Tourism Industry in Ghana, 2005 - 2009

Source: The State of the Ghanaian Economy, 2009

These trends should be continued and sustained. This implies that the government should continue to create an enabling and conducive atmosphere or environment for this sector to continue to perform effectively and efficiently as well as to continue to employ more active labour force directly and indirectly. As a result, establishing a very favourable macroeconomic climate for the Ghanaian economy is very necessary and sufficient. Consequently, the government should understand how and to what extent macroeconomic decisions affect the services sector of the Ghanaian Economy.

Tourism, which is a subsector of the services sector of the Ghanaian economy, remains the main source of foreign exchange by the services sector. In 2005, total arrivals of 429,000 tourists provided US\$836 million in receipts to Ghana’s economy. This increased to 497,000 arrivals in 2006 with corresponding receipts of US\$986.8 million. A tourism receipt by end of 2007 was US\$1,172 million (SGE, 2007). Since 1985, there has been a continuous increase in the number of tourists arrivals and foreign exchange earnings from the tourism industry and should be encouraged and continued (see fig. 5 below).

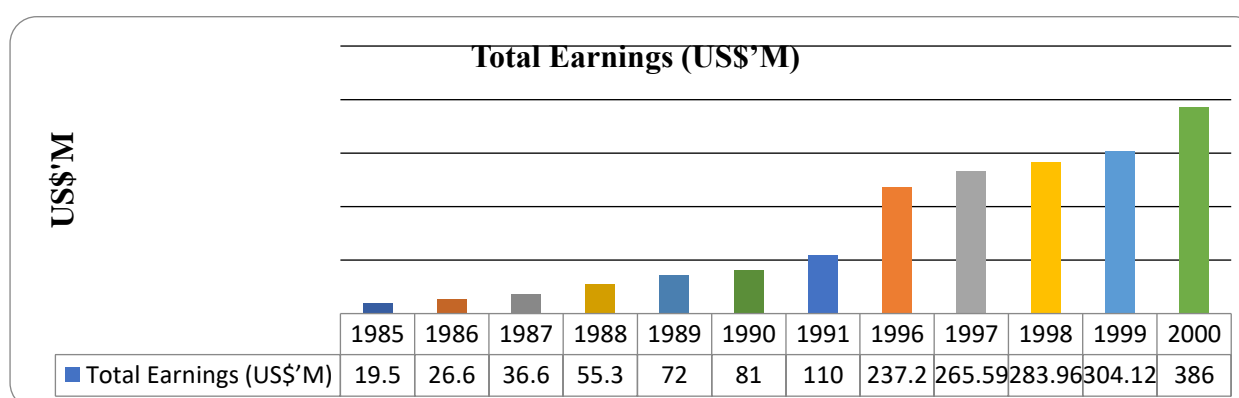


Figure 5: Earnings from Tourism Trade, 1985 - 2000

Source: Tourist Board

For these impressive performances to be continued and be sustained, establishing a favourable macroeconomic climate for the economy as a whole to stimulate growth and development is very pressing. This means that policy makers are keen on identifying and understanding how and to what extent macroeconomic variables are affecting the increasing services production or output of the Ghanaian economy.

Therefore, the goal of this study is to examine how and to what extent macroeconomic variables affect services production in Ghana.

Theoretical Literature Review

Sector Theory (Three Sector Hypothesis)

The sector theory argues that over time the relative share of production in each major sector will change in the region. It states that an economy is divided into three main sectors. These sectors are the primary sector (forestry, fisheries), secondary (manufacturing, mining) and tertiary (trade and service). Due to the income elasticity of demand for primary, secondary, and tertiary products, the region becomes specialized in primary, then secondary, and tertiary products. In other words, according to the hypothesis, the main focus of an economy's activity shifts from primary, through the secondary and finally to the tertiary 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.

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. As per capita income increases, the demand for manufactured goods will exceed the demand for primary products. Subsequently, the demand for services predominates and the service sector becomes the largest regional sector. Differently put, countries with a low per capita income are in an early stage of development; the main part of their national income is achieved through production in the primary sector. Countries in a more advanced stage of development, with a medium national income, grow their income mostly from the secondary sector. In very advanced countries, with a high income, the tertiary sector dominates the total output of such as economy, according to the hypothesis.

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 nonprofit 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.

Methodology

Model specification

This study empirically examines how and to what extent macroeconomic variables affect services production in Ghana. We specified our mathematical equation as Services output as a function of GDP per capita, government spending and inflation. This services output equation followed the Cobb – Douglas production function specification, which is of the form $Q = b_0 L^{b_1} K^{b_2}$ where Q is the Output produced, L is labour, K is capital, b_1 and b_2 are the partial elasticities with respect to labour and capital. In terms of linear formulation, the Cobb-Douglas Production function becomes $\ln Q = b_0 + b_1 \ln L + b_2 \ln K$ where $b_1 > 0$, $b_2 > 0$, $b_1 + b_2 > 1$

represents increasing returns to scale, $b_1 + b_2 < 1$ represents decreasing returns to scale and $b_1 + b_2 = 1$ represents constant returns to scale (Koutsoyiannis, 2006; Nellis and Parker, 2006; Adenutsi, 2013).

Therefore, the effect of these macroeconomic policy strategies on the services output is captured in the following regression equation.

$$\ln SQ_t = b_0 + b_1 \ln GDPPC_t + b_2 \ln GE_t + b_3 \ln CPI_t + U_t$$

$$b_1 > 0, b_2 > 0, b_3 < 0$$

Where;

SQ = services output measured as Services, value added (% of GDP)

GDPPC = GDP per capita (constant 2005 US\$)

GE = government expenditure (% of GDP)

CPI = Consumer price index (2005 = 100)

b_0 intercept

$b_1 - b_3$ = coefficient, partial elasticities

U = stochastic disturbance term.

Methods used

The ordinary least squares estimation technique was used to determine the various parameters of the services production equation specified.

The R squared was used to explain how good the fit is and to what extent the various independent variables included in the model jointly explain the dependent variable.

The F-statistic was used to ascertain the overall significance of the model. If the F-statistic

value $[F = \frac{R^2 \div g}{[1 - R^2] \div [n - k]}$, where g is the number of restrictions under test, n is the number

of observations and k equals the number of parameters estimated in the unrestricted model] exceeds F-critical value, then we can infer that the relationship is statistically significant overall and reject the null hypothesis [$H_0: \beta_1 = \beta_2 = \beta_3 = \dots = \beta_n = 0$ against $H_a: \beta_1 \neq \beta_2 \neq \beta_3 \neq \dots = \beta_n \neq 0$] that the estimated coefficients are not jointly statistically significant from zero.

The t-statistic was used to establish the statistical significance of the individual parameters. If

the t-statistic value $[t_{\text{value}} = \frac{\hat{\beta}_i}{S_{\hat{\beta}_i}}$ where $\hat{\beta}_i$ is the respective values of the parameters, $S_{\hat{\beta}_i}$ is

the standard errors of the respective parameters] exceeds t-critical value $[t_{\frac{\alpha}{2}, n-k}]$, then we

can infer that the parameter is statistically significant and reject the null hypothesis [$H_0: \beta_i = 0$ against $H_a: \beta_i \neq 0$].

Finally, the robustness of the models was tested. That is multicollinearity (by applying Variance Inflation Factor), autocorrelation (by applying Durbin-Watson test Statistic), and Heteroscedasticity. The acceptability of the model was also determined by comparing the value of the Durbin-Watson Statistic (DW) with the value of the Coefficient of Determination (R^2). If the value of the DW is greater than the value of the R^2 , then the model is acceptable or otherwise spurious regression (Mendenhall and Sincich, 1989; Wackerly et al., 2002).

Sample size

The study period was from 1980 to 2012. This period was chosen because this is period that Ghana started experiencing some level of macroeconomic stabilization. Thus, the sample size for this study was 32.

Source of Data

Data for all the variables of interest was sourced from the world development indicators 2013.

Econometric package used

The econometric software package used for the estimations was gretl.

Results Presentation and Discussion

Cochrane-Orcutt, using observations 1981-2012 (T = 32)

Dependent variable: I_SQ

	Coefficient	Std. Error	t-ratio	p-value	VIF
const	-3.93689	1.82796	-2.1537	0.04002	
I_GDPPC	1.42261	0.32421	4.3879	0.00015	5.124
I_GE	-0.365338	0.0987691	-3.6989	0.00094	1.728
I_CPI	-0.0882909	0.0395527	-2.2322	0.03378	5.624

Statistics based on the rho-differenced data:

Mean dependent var	3.588685		S.D. dependent var	0.180305
Sum squared resid	0.173412		S.E. of regression	0.078697
R-squared	0.827932		Adjusted R-squared	0.809496
F(3, 28)	10.91185		P-value(F)	0.000064
rho	0.078615		Durbin-Watson	1.767538

Robustness of the Model

There is no problem of multicollinearity since the VIF for each of the variables is less 10. There is no problem of autocorrelation since the value of the DW lies between 1.5 and 2.5. Heteroscedasticity is not a problem since one of the ways to deal with heteroscedasticity is to transform the variables into logarithm. The value of the DW is greater than the value of the R squared. This implies that the model is very acceptable. The value of the R squared is 83%. This means that about 83% of the total variation in services production is explained by GDP per capita, government expenditure and inflation and statistically, has a very good fit. The remaining is about 17%. This means that the other factors that the model did not consider constitute 17%. The overall model for services production in Ghana is statistically significant since the value of the p-value is less than 5%. Therefore, meaningful inferences can be made based on the results above.

Interpretation of the respective coefficients

According to the theory of progression as people income increases they begin to move away from the consumption of agriculture produce, industrial produce to services produce. This means that as people's income increases in an economy their demand for services products increase, which implies a positive relationship between GDP per capita and services production. From our estimation, a 1% increase in GDPPC leads 1.42261% growth in services production. The effect is elastic, meaning that an increase in people's income will cause the

demand for services produce to increase greatly, all else equal. The coefficient of GDP per capita is statistically significant. This implies that for the sustainability of the services sector of Ghana, rising incomes of Ghanaians is very key.

If government spending go into productive sectors of an economy like the provision of education, health care, first class roads, constant supply of quality water, constant supply of power, and housing, it is expected that services production will increase. However, the case of Ghana is otherwise. That is there is a negative relationship between government spending and services production. A 1% increase in government spending leads to a 0.365338% decrease in services output, *ceteris paribus*. On the other hand, a 1% decrease in government spending leads to a 0.365338% increase in services production, *ceteris paribus*. The effect is an inelastic effect. This means that a greater increase in government spending will lead to a smaller decrease in services production. This further means that government spending is not going to the productive sectors of the Ghanaian economy which will enhance the sustainability of the services sector. The coefficient of the government spending variable is statistically significant since the p-value is less than 5%.

An increase in the general price level adversely affects output. Such is the result we obtained, a negative relationship between inflation and services output. A 1% increase in the general price level leads to a 0.0882909% decrease in services output, all things being fixed. However, a 1% decrease in the general price level leads to a 0.0882909% increase in services production, all things being equal. This implies that persistent increase in the general price level is unhealthy for the growth and development of the services sector of Ghana. The coefficient of the consumer price index is statistically significant since the value of the p-value is less than 5%. This further means price stabilization is the growth of the services sector of Ghana.

Policy Recommendations

From the above results and discussions, the following recommendations are suggested.

1. Policy makers should do all that they can to create the enabling environment which will grow and sustain the Ghanaian economy positively. This will increase Ghana's GDP as well as GDP per capita which will grow and sustain the services sector of Ghana. Since when people's income increases they demand more of services produce instead of agricultural and industrial products.
2. Government spending should be directed to the productive sectors of the Ghanaian economy (such as education, health care, first class roads, housing, constant supply of quality water, constant supply of electricity and so on). This will ensure the survival, the growth and the sustainability of the services sector of Ghana.
3. Monetary authorities should continue to put strategies in place to stabilise inflation.

Conclusion

The study looks at the effect of macroeconomic policies on the services output of Ghana from the period 1980 to 2012. The method of the ordinary least squares estimation was used. The model was free from multicollinearity, autocorrelation and heteroscedasticity problems. GDP per capita was found to affect services output positively and it was statistically significant. Government spending and public enemy number one which is inflation were found to negatively affect services production in Ghana. They were each statistically significant at the 5% significance level. In view of these, macroeconomic policies that enhance favourable economic expansion, ensure effective and efficient government spending and reduce the rate

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References

- Adenutsi, D. E. (2013). *Essentials of Microeconomics for Business and Entrepreneurship*. 1st Edition, New Delhi, Excel Books.
- Institute of Statistical, Social and Economic Research, *The State of the Ghanaian Economy, various issues*, University of Ghana, Legon.
- Koutsoyiannis, A. (2006). *Modern Microeconomics*. 2nd Edition, London, Macmillan Press Ltd.
- Mendenhall, W. and Sincich, T. (1989). *A Second Course in Business Statistics: Regression Analysis*. United States of America, Dellen Publishing Company, a division of Macmillan, Inc.
- Nellis, J. G. and Parker, D. (2006). *Principles of Business Economics*. 2nd Edition, Great Britain, Pearson Education Limited.
- Wackerly, D.D., Mendenhall III, W., and Scheaffer, R. L. (2002). *Mathematical Statistics with Applications*. 6th Edition, United States of America, Duxbury and Brooks/Cole.
- Wikipedia, the free encyclopedia.