The Effect of Government Expenditure and Free Maternal Health Care Policy on Household Consumption in Ghana

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Abstract:

In Covid-19 pandemic era when most households' members have lost their jobs and incomes, the government assistance and programs in ensuring consumption smoothing is imperative. The main objectives of this study are to analyze the impact of government expenditure and free maternal healthcare policy on household consumption expenditure in Ghana using the ARDL estimation technique and historical data from 1967 to 2018. The results revealed that government expenditure and free maternal healthcare policy had a negative and statistically significant effect of on household consumption expenditure in Ghana in both long run and short run. The result suggests that government expenditure and free maternal healthcare policy crowed-out private consumption in Ghana. In addition, the marginal propensity to consume in the long run is 0.690 while the marginal propensity to consume in the short run is 0.214 suggesting that real income have much higher effect on household consumption in the long run than in the short run. The study suggests the need to increase public spending on basic social amenities and also extend the free maternal healthcare policy to all pregnant women especially those in the rural areas of Ghana as these have a greater impact on household consumption in Ghana. The findings from the study have important implications for household savings and interest rate in Ghana.

1.0. Introduction

The role of government expenditure and free maternal healthcare policy is critical not only in promoting economic growth but also very significant in ensuring household consumption smoothing especially when most households around the globe have lost their jobs and incomes due to coronavirus pandemic. In most developing countries and particularly Ghana, the government is responsible for the provision of basic social amenities such as toilet facilities, roads, water, electricity, national defense, and law among others due to market failures that occurs when the private sector provides these facilities (Mahmud and Ahmed, 2012). Another reason is that most developing and low-income countries like Ghana are confronted with issues of low private savings and low investments and so it is incumbent on the government to providing basic infrastructure and social services for its citizens.

In 1967, household consumption expenditure in Ghana was US$ 1,209,980,674.0. In 2018, household consumption expenditure has increased to US$ 47,197,112,973.0 representing a change of 97.43% (World Bank, 2020; see Figure 1). At the household level, in 2008, the

average annual household consumption expenditure in Ghana was around GH¢ 1,918.0 which approximate to about US$ 504.7 per capita (GSS, 2008; Bonsu and Muzindutsi, 2017). In 2018, the annual household consumption expenditure in Ghana per capita has increased to US$ 1,583.49 (World Bank 2020). Over the past years, the government of Ghana has implemented several social intervention programs such the Livelihood Empowerment Against Poverty (LEAP), Capitation Grant, School Feeding Programme, free distribution of school uniforms, elimination of schools under trees, free senior high school education, the establishment of Community based Health Planning Services (CHPS), and national immunization against polio among others. All these programs were implemented to alleviate poverty among the vulnerable population, smooth household consumption, and to raise the standard of living of the people (GSS, 2018).

In addition, the country has made significant progress with access to drinking water, toilet facilities, electricity, health care, and school enrolment etc. For instance, between 2005-2017, access to electricity in Ghana has increased dramatically from 45.3% to 81.4% (GSS, 2018). Also, in 2018, access to electricity in Ghana has reached 82.4% of the entire population compared to Cote D'Ivoire (67%), Kenya (75%), Nigeria (56.5%), Tanzania (35.6%), Rwanda (34.7%) and Sub-Sahara Africa (47.7%) (World Bank, 2020). Although there has been an increase in access to these social services and programs, the gaps between urban and rural households and across regions in terms of household consumption of these services and products remain significant issue (see Figure 3 and Table 8). In Ghana, the proportion of households with access to electricity still varies by quintile and urban/rural areas, with the lowest wealth quintile in rural areas having the least access 46.1% and the highest quintile in urban area having the highest access 96.8% (GSS, 2018).

Maternal mortality is one of the greatest challenges confronting most developing countries including Ghana. According to the World Health Organization (WHO) (2016), about 800 women die every year due to complications associated to pregnancy and childbirth (WHO, 2016). In Ghana, maternal mortality ratio increased from 173 per 100,000 live births in 2014 to 319 per 100,000 live births in 2015 (GHS, 2011, WHO, 2016). To achieve the Sustainable Development Goal (SDG 3) targeted at reducing global maternal mortality ratio to less than 70 per 100,000 live births, in 2008, the government of Ghana introduced several intervention policies in order to improve utilization of maternal healthcare services including ANC and skilled attendance at childbirth (GHS, 2015 and Lagarde & Palmera, 2008, Dickson et al., 2017). These programs include the implementation of free maternal healthcare policy, repositioning family planning, and repositioning reproductive and child health staff (GHS, 2015). The free maternal healthcare policy allows pregnant women to immediately receive free health services for their pregnancy, during labor, and birth and up to three months postpartum (Dalinjong et al., 2018). Empirical studies have indicated a strong positive relationship between free maternal healthcare and ANC utilization (Dzakpasu et al., 2014 and Hatt et al., 2013). For instance, in Malawi, fee exemption in mission health facilities increases ANC visits by about 15% (Manthalu, 2016).

In Ghana, there has been a steady decline in antenatal care (ANC) visits (4+) from 98.6% in 2011, to 90.8% in 2013, and down to 86.7% in 2014 (Ghana Health Service (GHS), 2015). The study by Dickson et al. (2017) also showed that the number of women who benefited from antenatal care in Ghana increased from 55% in 1988 to 89.5% in 2014. Between 2017 to 2018, antenatal care in Ghana declined further to 85% although the Ghana recorded the highest level in

Africa (UNICEF 2019). The downward trend in ANC visits in Ghana in recent times has been linked to inadequate funds for outreach programs in the communities as well as poor data (GHS, 2015; Dalinjong et al., 2018). In addition, Arthur (2012) and Dixon et al., (2014) have shown that pregnant women who are uneducated, poor, and live in rural communities tend to have fewer to ANC to their counterparts who are educated, rich, and are urban dwellers. The basic question is what is the implication of these government programs on household consumption in Ghana?

Generally, there is no consensus on the qualitative response of government expenditure shock on household consumption both theoretically and empirically (Ercolani, 2007). In their study, Blejer and Cheasty (1989) recognized the complementarities between public and private investment in case of developing countries. That is, their work explained that public investment in infrastructure and provision of public goods can increase private sector investment and productivity. Fosu (2016) also found that public investment in economic and social infrastructure had a positive effect on private investment in Ghana. From both neoclassical and New-Keynesian perspective, Baxter and King (1993) showed that private consumption decreases following positive shock on government expenditure because negative wealth tend to reduce the household permanent income. In a similar study, Ramey and Shapiro (1998) employed the so-called narrative approach within the framework of vector-autoregressive approach and found that government consumption crowds-out private consumption. On the other hand, Lopez-Salido and Rabanal (2006) did a similar study and found that the form of complementarity between household consumption and hours worked enables consumption to increase after a government shock.

Previous studies have analyzed the effect of real exchange rate, real GDP, inflation, migration, remittances, and rapid urbanization on household consumption in Ghana (Bonsu and Muzindutsi, 2017; Karamba et al., 2011; Adams et al., 2008, Quartey, 2006, and Frimpong, 2013). Given the significant role of government expenditure and free maternal health care policy in household consumption smoothing, to the best of my knowledge, no empirical study has analyzed the impact of government spending and free maternal health care policy on household consumption in Ghana. The broad objectives of this study therefore are first, to examine the impact of government expenditure on household consumption in Ghana in both short run and long run and secondly, to analyze the impact of free maternal healthcare policy on household consumption in Ghana in both short run and long run. The current study contributes to empirical literature because it is the first empirical study to examine the effect of government expenditure and free maternal healthcare policy on household consumption in Ghana. In addition, the outcome of this study has important implications for fiscal policy and health policy for decisions makers in Ghana and the entire Africa. The rest of the paper is organized as follows. The first section presents a review of relevant literature, followed by the methodology. The next section presents the results and discussions and the last section presents the conclusion and recommendations.
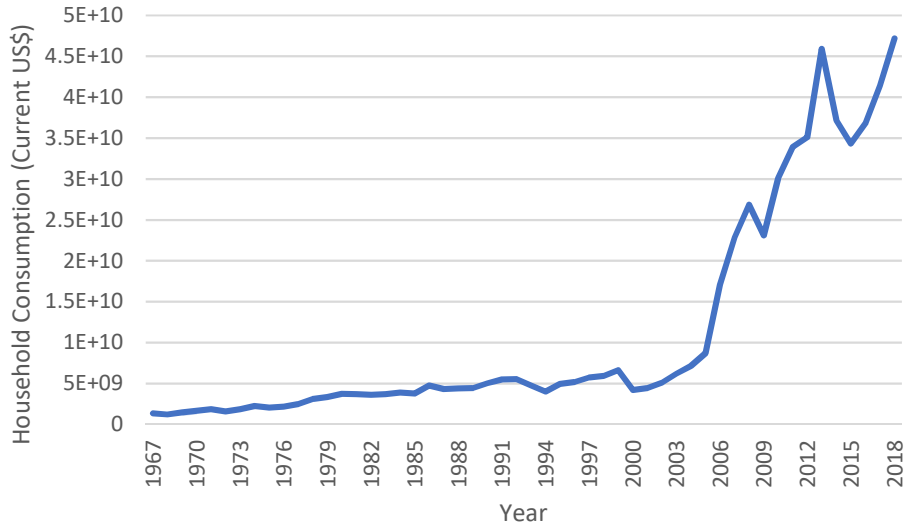
Figure 1: Trends in Household Consumption Expenditure in Ghana (Current US$). Source: World Bank (2020)
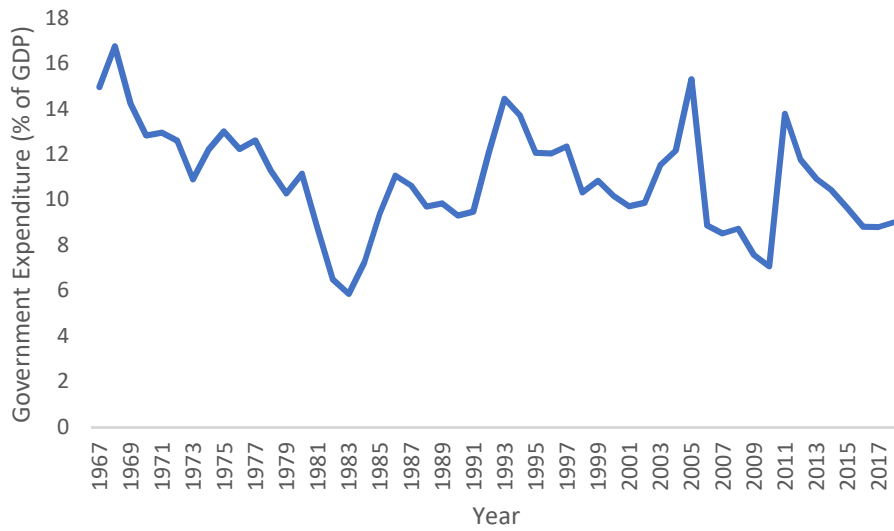

Figure 2: Trends in Government Expenditure in Ghana (% of GDP).
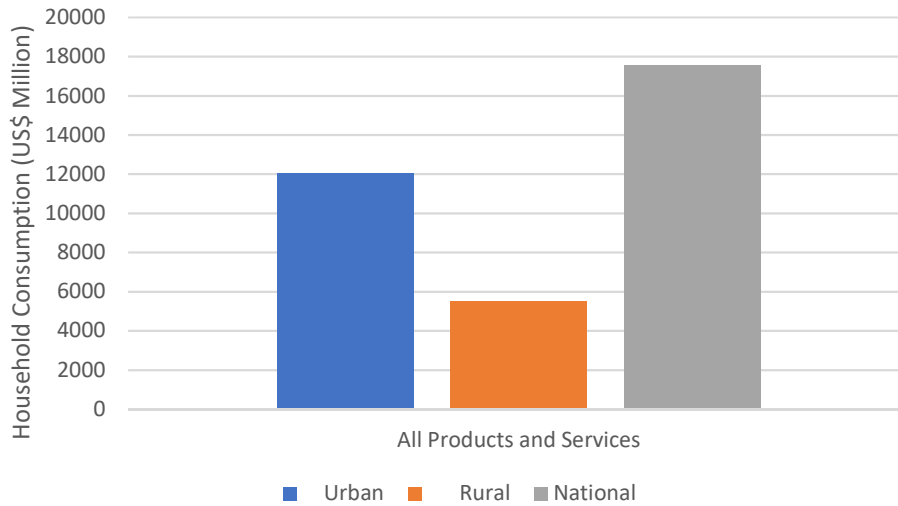Source: World Bank (2020).

Figure 3: Household Consumption in Ghana by Product/Service and Area in US$ (Million) (2005-2006). Source: World Bank (2020), GSS (2007).

2.0. Literature Review

This section of the study review literature on the determinant of household consumption in Ghana. In their empirical study, Karamba et al., (2011) examined the link between migration and food consumption in Ghana. An instrument variable approach and 4130 households' members from the 2005/2006 Ghana Living Standard Survey were used for the study. The results show that migration does not substantially affect total food expenditures per capita and has minimal noticeable effect on food expenditure patterns. Their results also indicate that migration increase food expenditure only in high migration regions.

Using the vector autoregressive model and Johansen multivariate cointegration approach, and a time series data covering 1961 to 2013, Bonsu and Muzindutsi (2017) analyzed the macroeconomic determinants of household consumption expenditure in Ghana. The results revealed a significant a long run relationship between real household consumption and selected macroeconomic variables with a marginal propensity to consume of 0.7971. In addition, granger causality, impulse response, and variance decomposition revealed that in the short run, household consumption is largely affected by inflation, while it has a significant effect on the real exchange rate and economic growth. The findings from the study are important for understanding the macroeconomic role of household consumption in Ghana.

More so, Adams et al., (2008) used household survey data from Ghana to analyze within a rigorous econometric framework how the receipt of internal remittances and international remittances affect the marginal spending behavior of households on a broad range of consumption and investment goods such as food, education, and housing. The study revealed that households receiving remittances in Ghana do not spend more at the margin on food, education, and housing than household not receiving remittances. Differences in consumption between household receiving remittances and household not remittances are explained by observed and unobserved characteristics of households.

Furthermore, Quartey (2006) used 1 to 4 of the Ghana Living Standard Survey and examined whether migrant remittances affect household welfare in Ghana. The results from the study revealed that remittances improve household welfare and help to ameliorate the effect of shocks to household welfare.

In a similar study, Frimpong (2013) analyzed the influence of rapid urbanization on urban consumption pattern and food security using primary data obtained from urban households in the Ashanti Region of Ghana. The results showed that yam, cassava, and rice are largely consumed in the region. It was also revealed that food constitutes 74.6% of urban household budget. In addition, the estimated food index of 0.66 indicates that the average urban household in the region were food insecure. More so, the findings revealed that 78.5% of the respondents are food insecure while 34.2% are affected by food insecurity. The study recommended government and stakeholders to promote the consumption of local foods by branding local food.

It can be observed that previous studies have focused on variables such as inflation, GDP, real exchange rate, remittances, and migration and how they affect household consumption in Ghana. That is, empirical analyzes on the effect government expenditure and free maternal health care on household consumption in Ghana have been given much attention in the literature. This study seeks to fill this gap in the literature by examining the impact of government expenditure and free maternal healthcare policy on household consumption in Ghana.

3.0. Methodology
3.1. Theoretical Model

To analyze the impact of government expenditure on household consumption, the study employed the representative agent model. The model assumed that the representative agent has infinite planning horizon, to face perfect capital markets, and to have perfect foresight (Turnovsky, 2000). The agent's aim is to maximize his consumption by choosing his private rate of consumption (c), supply of labor (l), capital stock (k), and holdings of government bonds (b).

The agent tries to maximize his utility in equation (1):

$$max \int_0^\infty U(c, l, g)e^{-\beta t} dt \tag{1}$$

$$U_c > 0, U_{cc} < 0, U_l < 0, U_{ll} < 0, U_g > 0, U_{gg} < 0$$

Subject to the budget constraint

$$c + \dot{k} + \dot{b} = F(k, l) + rb - T \tag{2}$$

and the initial conditions

$$b(0) = b_0, \ k(0) = k_0 \tag{3}$$

Where g is real government consumption expenditure, T is lump-sum taxes, β is rate of consumer time preference, and r is real interest rate. Also, $T, \beta,$ and r are assumed to be

constant. The output in this economy is shown by the neoclassical production specified by Equation (4).

$$y = F(k, l); \qquad F_k > 0, F_{KK} < 0, F_l > 0, F_{ll} < 0 \qquad (4)$$

For simplicity, the study assumed no depreciation of capital. It is also assumed that F is linearly homogeneous in capital and labor. This implies that , $F_{KK}F_{ll} - F_{kl}^2 = 0$ and $F_{kl} > 0$.

To solve this optimization problem, the study specifies the Lagrangian expression:

$$\text{H} = U(c, l, g)e^{-\beta t} + \lambda e^{-\beta t}(F(k, l) + rb - T - c - \dot{k} - \dot{b})) \qquad (5)$$

where $\lambda(t)$ measures the marginal utility of wealth. The optimality conditions from the Hamiltonian function are specified below:

$$\frac{\partial H}{\partial c} = 0, \frac{\partial H}{\partial l} = 0, \frac{\partial H}{\partial k} + \frac{\partial}{\partial t}\left(\lambda e^{-\beta t}\right) = 0, \frac{\partial H}{\partial b} + \frac{\partial}{\partial t}\left(\lambda e^{-\beta t}\right) = 0 \text{ gives equation (6) –(9)}$$
respectively.

$$U_c(c, l, g) = \lambda \qquad (6)$$
$$U_l(c, l, g) = -\lambda F_l(k, l) \qquad (7)$$
$$\lambda F_k(k, l) = -\dot{\lambda} + \lambda\beta \qquad (8)$$
$$\lambda r = -\dot{\lambda} + \lambda\beta \qquad (9)$$

Thus, equation (6) states that at equilibrium, the agent's marginal utility of consumption must equal his marginal utility of wealth. Equation (7) shows that marginal utility of an extra unit of leisure must equal the marginal utility of consumption priced at the real wage rate. Equation 6 and (7) are static efficiency conditions while equation (8) and (9) are dynamic efficiency conditions. More so, the transversality conditions below must hold to eliminate explosive equilibria.

$$\lim_{t\to\infty} \lambda k^{-\beta t} = 0 \qquad (10)$$
$$\lim_{t\to\infty} \lambda b^{-\beta t} = 0 \qquad (11)$$

In this model, the other agent is the government. The government makes expenditure decisions, taxations decisions, and financing decisions subject to its flow constraint in Equation (12).

$$\dot{b} = g + rb - T \qquad (12)$$

Equation (12) shows that government deficit is government expenditures plus interest payments on its outstanding debts less tax revenues must be financed by issuing additional debt.

By substituting Equation (12) into Equation (2) yields Equation (13).

$$F(k, l) = c + \dot{k} + g \tag{13}$$

Equation (13) is the market clearing which shows that current output must be either consumed by household, consumed by the government or accumulated as additional capital stock.

From Equation (6) and (7), c and l can be solved in the form:

$$c = c(\lambda, k, g) \tag{14}$$

$$l = l(\lambda, k, g) \tag{15}$$

From these equations we can also determine:

$$\frac{\partial c}{\partial \lambda}, \frac{\partial c}{\partial k}, \frac{\partial c}{\partial g}, \frac{\partial l}{\partial \lambda}, \frac{\partial l}{\partial k}, \frac{\partial l}{\partial g}$$

Equation (14) is the Ricardian Equivalence which emanates from the dynamic competitive macroeconomic model with government having discretion to issue bonds and impose tax to finance government spending.

3.2. Econometric Model

The broad objective of this study is to examine the impact government expenditure on household consumption in Ghana. To address this objective, the study adjusts the consumption function in Equation (14) to include free maternal healthcare. This is specified below:

$$lnHSC_t = \delta + \eta lnGOE_t + \phi FMHC_t + \vartheta lnGDP_t + \epsilon_t \tag{16}$$

Where HSC is household consumption expenditure or private consumption measured as household final consumption expenditure (% of GDP), GOE is government expenditure measured as general government final consumption expenditure (% of GDP), FMHC is free maternal healthcare to capture the effect of health policy. FMHC is a dummy variable (i.e. 0 = period before FMHC implemented, 1967-2007, and 1 = period after FHMC implementation, 2008-2018). GDP is GDP per capita growth (annual %). t is time, ln is natural log. δ is an intercept parameter, η, ϕ, and ϑ are slope coefficients or the elasticity. Government expenditure and free maternal healthcare can act as a substitute or a complement to household consumption, so the study expects these variables to be positively or negatively related to household consumption (i.e. $\eta > 0$ or < 0, $\phi > 0$ or < 0). Also, an increase in income ceteris paribus will lead to increase in household consumption for a normal good (i.e. $\vartheta > 0$). For inferior good, an increase in income will lead to a fall in household consumption (i.e. $\vartheta < 0$). In addition, the

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study used secondary data covering the period of 1967 to 2018. Data on household consumption, government consumption expenditure, and real GDP were gleaned from the World Bank while the dummy variable (i.e. free maternal healthcare was generated by the author.

3.3. Estimation technique

3.3.1. Unit Root Tests
Unit root test is expected to be the first step to be taken in time series regression analysis. The reason for conducting this test is to distinguish between stationary and non-stationary variables to come up with statistically reliable results. In order to test for unit root, the study employed the Augmented Dickey-Fuller (ADF) test and the Phillips-Perron (PP) test. When conducting the ARDL estimation, it is assumed that the series are either I(0) or I(1) and so prior to using this estimation technique, the study determined the order of integration of all the variables except the dummy variable (i.e. free maternal health care). This is because dummy variable by nature are nonstationary and so does not require any further stationarity test. Essentially, this was done to ensure that the variables are not I(2) because ARDL does not work for I(2) or higher order integrated series.

3.3.2. *ARDL Estimation*
To examine the long-run relationship and short-run dynamics among the variables, the ARDL cointegration technique developed by Pesaran et al. (1999) and Pesaran et al. (2001) was employed. This estimation technique has several advantages than other estimation techniques. For instance, the ARDL allows a mixture of both I(0) and I(1) variables to be used. In addition, the method is relative efficient especially when working with small and finite sample data. The mathematical representation of the ARDL model in this study is shown below:

$$
\begin{aligned}
D(\ln(HSC_t)) = {} & \alpha_{01} + \beta_{11}\ln(HSC_{t-1}) + \beta_{21}\ln(GOE_{t-1}) + \beta_{31}\ln(FMHC_{t-1}) + \beta_{41}\ln(GDP_{t-1}) \\
& + \sum_{i=1}^{P}\alpha_{1i}Dln(HSC_{t-i}) + \sum_{i=1}^{P}\alpha_{2i}Dln(GOE_{t-i}) + \sum_{i=1}^{P}\alpha_{3i}Dln(FMHC_{t-i}) + \sum_{i=1}^{P}\alpha_{4i}Dln(GDP_{t-i}) \\
& + \epsilon_{1t}
\end{aligned}
\tag{17}
$$

$$
\begin{aligned}
D(\ln(GOE_t)) = {} & \alpha_{02} + \beta_{12}\ln(HSC_{t-1}) + \beta_{22}\ln(GOE_{t-1}) + \beta_{32}\ln(FMHC_{t-1}) + \beta_{42}\ln(GDP_{t-1}) \\
& + \sum_{i=1}^{P}\alpha_{1i}Dln(GOE_{t-i}) + \sum_{i=1}^{P}\alpha_{2i}Dln(HSC_{t-i}) + \sum_{i=1}^{P}\alpha_{3i}Dln(FMHC_{t-i}) + \sum_{i=1}^{P}\alpha_{4i}Dln(GDP_{t-i}) \\
& + \epsilon_{2t}
\end{aligned}
\tag{18}
$$

$$
\begin{aligned}
D(\ln(FMHC_t)) = {} & \alpha_{03} + \beta_{13}\ln(HSC_{t-1}) + \beta_{23}\ln(GOE_{t-1}) + \beta_{33}\ln(FMHC_{t-1}) + \beta_{43}\ln(GDP_{t-1}) \\
& + \sum_{i=1}^{P}\alpha_{1i}Dln(FMHC_{t-i}) + \sum_{i=1}^{P}\alpha_{2i}Dln(GOE_{t-i}) + \sum_{i=1}^{P}\alpha_{3i}Dln(HSC_{t-i}) + \sum_{i=1}^{P}\alpha_{4i}Dln(GDP_{t-i}) \\
& + \epsilon_{3t}
\end{aligned}
\tag{19}
$$

$$
\begin{aligned}
D(\ln(GDP_t)) = {} & \alpha_{04} + \beta_{14}\ln(HSC_{t-1}) + \beta_{24}\ln(GEP_{t-1}) + \beta_{34}\ln(FMHC_{t-1}) + \beta_{44}\ln(GDP_{t-1}) \\
& + \sum_{i=1}^{P}\alpha_{1i}Dln(GDP_{t-i}) + \sum_{i=1}^{P}\alpha_{2i}Dln(GEP_{t-i}) + \sum_{i=1}^{P}\alpha_{3i}Dln(FMHC_{t-i}) + \sum_{i=1}^{P}\alpha_{4i}Dln(HSC_{t-i}) \\
& + \epsilon_{4t}
\end{aligned}
\tag{20}
$$

Where ln is the logarithm operator, α and β are unknown parameters to be estimated, D is the first difference, and ϵ is the error term. Equations (17)-(20) indicate that household consumption, government expenditure, free maternal healthcare policy, and income tend to be influenced and explained by their past values. The optimal lag length is determined by using the either the minimum of AIC or SIC. The first step in the ARDL estimation is to estimate the equations (17)-(20) by OLS.

The OLS estimation of these equations essentially test for the presence of long relationship among the variables by conducting an F-test for the joint significance of the coefficients of the lagged levels of variables (Belloumi 2014, Fosu 2017). The null hypothesis of no cointegration given by H_0: $\beta_{1i} = \beta_{2i} = \beta_{3i} = 0$ against the alternative one given by H_A: $\beta_{1i} \neq \beta_{2i} \neq \beta_{3i} \neq 0$ for all i=1,…, 3. The calculated F-Statistic value will be compared to the critical values determined by Pesaran et al., (2001). According to Pesaran et al., (2001), the lower bound critical values assumed that all variables included in the ARDL are integrated of order zero, while the upper bound critical values assumed that variables are integrated of order. If the F-statistic exceeds the upper critical bounds value the null hypothesis of no cointegration is rejected, while it is accepted if F-statistic is lower than the lower bounds value. The test is inconclusive if the F-statistic lies between them.

Following the empirical work of Belloumi (2014) and Odhiambo (2009), the study specified the short run dynamic coefficients by estimating the error correction model associated with the long run estimates. This is specified as follows:

$$D(\ln(HSC_t)) = \alpha_0 + \sum_{i=1}^{P} \alpha_{1i}Dln(HSC_{t-i}) + \sum_{i=1}^{P} \alpha_{2i}Dln(GOE_{t-i}) + \sum_{i=1}^{P} \alpha_{3i}Dln(FMHC_{t-i}) + \sum_{i=1}^{P} \alpha_{4i}Dln(GDP_{t-i})$$
$$+ \tau ECT_{t-1} + \epsilon_{1t} \tag{21}$$

$$D(\ln(GOE_t)) = \alpha_0 + \sum_{i=1}^{P} \alpha_{1i}Dln(GOE_{t-i}) + \sum_{i=1}^{P} \alpha_{2i}Dln(HSC_{t-i}) + \sum_{i=1}^{P} \alpha_{3i}Dln(FMHC_{t-i}) + \sum_{i=1}^{P} \alpha_{4i}Dln(GDP_{t-i})$$
$$+ \tau ECT_{t-1} + \epsilon_{2t} \tag{22}$$

$$D(\ln(FMHC_t)) = \alpha_0 + \sum_{i=1}^{P} \alpha_{1i}Dln(FMHC_{t-i}) + \sum_{i=1}^{P} \alpha_{2i}Dln(GOE_{t-i}) \sum_{i=1}^{P} \alpha_{3i}Dln(HSC_{t-i}) + \sum_{i=1}^{P} \alpha_{4i}Dln(GDP_{t-i})$$
$$+ \tau ECT_{t-1} + \epsilon_{3t} \tag{23}$$

$$D(\ln(GDP_t)) = \alpha_0 + \sum_{i=1}^{P} \alpha_{1i}Dln(GDP_{t-i}) + \sum_{i=1}^{P} \alpha_{2i}Dln(GOE_{t-i}) + \sum_{i=1}^{P} \alpha_{3i}Dln(FMHC_{t-i}) + \sum_{i=1}^{P} \alpha_{4i}Dln(HSC_{t-i})$$
$$+ \tau ECT_{t-1} + \epsilon_{4t} \tag{24}$$

Where $\alpha_{1i}, \alpha_{2i}, \alpha_{3i}, \alpha_{4i}$ and α_{5i} are the short run dynamic coefficients, τ indicate the speed of adjustments, and ECT_{t-1} is the error correction term.

4.0. Results and Discussions

This section of the study presents the empirical results of the study. This study has two key objectives. The first to examine the effect of government expenditure on household consumption expenditure in Ghana in the short run and long-run and the second is to examine the effect free maternal health care policy on household consumption expenditure in Ghana in the short run and long-run. Table 1 presents the summary statistics of the data. Table 1 shows that average household consumption expenditure within the study period is around 80.93% with the minimum and maximum consumption around 66.99% and 94.23% of GDP. Average government spending is 10.89 % of GDP with minimum government spending around 5.86 % of GDP and maximum government spending around 16.76% of GDP. Free maternal healthcare policy (FMHC) is a dummy variable (i.e. 0 = period before the policy, and 1= period after the policy). Average GDP growth per capita within the study period is 1.27% with the minimum and maximum GDP growth per capita equal -14.50% % and 11.31% respectively. In addition, skewness and kurtosis test showed that household consumption and government expenditure are normally distributed except GDP and free maternal healthcare.

Table 1: Summary Statistics

	HSC	GOE	GDP	FMHC
Mean	80.93870	10.89718	1.271516	0.211538
Median	82.89467	10.87726	1.907288	0.000000
Maximum	94.23171	16.76471	11.31545	1.000000
Minimum	66.99211	5.861290	-14.50853	0.000000
Std. Dev.	6.576492	2.307435	4.358827	0.412384
Skewness	-0.092243	0.155140	-1.211940	1.412645
Kurtosis	2.329410	2.852780	5.769546	2.995565
Jarque-Bera	1.048073	0.255552	29.34876	17.29494
Probability	0.592125	0.880050	0.000000	0.000176
Sum	4208.812	566.6534	66.11885	11.00000
Sum Sq. Dev.	2205.763	271.5371	968.9679	8.673077
Observations	52	52	52	52

Source: World Bank (2020), Author's Construct. Software: EViews SV. 11

4.1. Test of Unit Root

The study conducted the ADF and PP unit root test for intercept only and intercept and trend. This is shown in Table 2 and Table 3 respectively. The results show that all variables are stationary at their levels except household consumption, which is nonstationary. Variables that are stationary at levels have their order of integration to be I(0) while the nonstationary variable have its order of integration to be I(1). The choice of the ARDL estimation is suitable for this study becuase it allows for a mix of both I(0) and I(1) variables to be used for the estimation.

Table 2: Unit Root Test-ADF and PP (Intercept Only)

Variable	ADF (Level) (Intercept Only)		PP (Level) (Intercept Only)		
	t-Statistic	P-Value	t-Statistic	P-Value	OI
HSC	-2.965**	0.045	-2.307	0.173	I(0), I(1)
GOE	-3.338**	0.018	-3.304**	0.019	I(0)
GDP	-4.614***	0.000	-4.639***	0.000	I(0)

Note: ***, **,* *indicate 1%, 5%, and 10% significance level,* OI indicates order of integration.
Source: World Bank (2020), Author's Construct. Software: EViews SV. 11

Table 3: Unit Root Test- ADF and PP ((Intercept and Trend)

Variable	ADF (Level) (Intercept & Trend)		PP (Level) Intercept & Trend)		
	t-Statistic	P-Value	t-Statistic	P-Value	OI
HSC	-2.832	0.193	-2.144	0.509	I(1)
GOE	-3.437**	0.057	-3.471**	0.053	I(0)
GDP	-5.374***	0.000	-5.167***	0.000	I(0)

Note: ***,**,* *indicate 1%, 5%, and 10% significance level,* OI indicates order of integration.
Source: World Bank (2020), Author's Construct. Software: EViews SV. 11

4.2. Test of Long Run Relationship

The Wald and F-Statistic test of cointegration indicate the presence of a long run relationship among the variables. This is shown in Table 4. Since the test statistic lies above the upper bound, the null hypothesis of no level effect is rejected (Table 4).

Table 4: Test of Long Run Relationship

	Lower Bound (95%)	Upper Bound (95%)
F-Statistic 15.034	11.493	11.493
W-Statistic 15.034	11.493	11.493

Source: World Bank (2020), Author's Construct. Software: Microfit 5.5

4.3. Long run estimates

Table 5 presents the long-run results of the study. The results revealed a negative and 1% significant effect of governments spending on household consumption expenditure. Empirically, 1% increase in government expenditure decreases household consumption expenditure by 3.083% in the long run. This result suggests that government expenditure crowed-out private consumption in Ghana. The findings from this study is consistent with the findings by Ramey and Shapiro (1998), Smets and Wouters (2003), and Baxter and King (1993) who also found that government spending crowds-out private consumption. However, the findings from this study contradicts the work of Blanchard and Perotti (2002), Linnemann and Schabert (2004), Mountford and Uhlig (2005) who found out that shocks to government spending increases household consumption.

Similarly, free maternal healthcare policy revealed a negative and 1% statistically significant effect on household consumption in Ghana in the long run. The results indicate that household consumption expenditure decrease by 14.868% after the implementation of the free maternal healthcare policy compared to the period without the policy. This result suggests that free maternal healthcare policy also crowd-out household consumption spending in Ghana just as the general government consumption. This result is expected because the free maternal policy essentially eliminates out of pocket (OOP) payments and enhance the utilization of maternal healthcare services Dalinjong et al, (2018). In other words, free maternal policy enables pregnant women to spend less on healthcare and so can save more.

Furthermore, the coefficient of real GDP indicates that marginal propensity to consume (MPC) is 0.690; implying that 1% increase in real GDP (i.e. income) leads to about 0.690% increase in household consumption expenditure in Ghana in the long run. This finding supports the results of Bonsu and Muzindutsi (2017) who also found MPC of 0.797 in Ghana. Differences in MPC between the current study and Bonsu and Muzindutsi (2017) might be due to the impact of government expenditure and free maternal health care which households to spend less and hence save more. More so, this result is consistent with Chioma (2009) and Mallik and Pradhan (2012) who found a positive and significant relationship between household consumption and income.

Table 5: The Long-Run Estimates

Dep Var: HSC

Variables	Coef.	Std. Error	T-Stat	P-Value
GOE	-3.083	0.873	-3.531	0.001***
FMHC	-14.868	5.162	-2.880	0.006***
GDP	0.690	0.399	1.729	0.091*
CONSTANT	116.458	10.001	11.644	0.000***

Note: ****,**,* indicate 1%, 5%, and 10% significance level*

Source: World Bank (2020), Author's Construct. Software: Microfit 5.5

4.4. The Error Correction Model

Table 6 presents the short-run results of the study. The error correction term (ECM (-1)) indicates the speed of adjustment. It is negative and statistically significant as expected. The speed of adjustment value of -0.310 indicates that approximately about 31% of the short-run disequilibrium is corrected in the long-run. Also, the short run estimates are similar to the long run estimates in terms of signs of coefficients. the short run results indicate that 1% increase in government expenditure leads to 0.956% decreases in household consumption expenditure in Ghana. More so, in the short run, the free maternal healthcare policy implementation decreases household consumption expenditure by 4.61% compared to the periods before the policy started. These results also suggest that both government consumption expenditure and free maternal healthcare policy crowd-out household consumption expenditure in Ghana in the short run. In addition, the MPC is 0.214 indicating that 1% increase in income leads to about 0.214% increase in household consumption expenditure.

Table 6: The Error Correction Model (Short-Run Estimates)

Dep Var: dHSC				
Variables	Coef.	Std. Error	T-Stat	P-Value
dGOE	-0.956	0.243	-3.934	0.000***
dFMHC	-4.610	1.334	-3.455	0.001***
dGDP	0.214	0.121	1.768	0.085*
ECM(-1)	-0.310	0.079	3.924	0.000***
R-Sqared	0.361	Akaike info Criterion		-136.841
F-Statistic	6.505	Schwarz criterion		-141.670
DW-Statistic	2.275			

Note: ***,**, * *indicate 1%, 5%, and 10% significance level, D is first differenced.*

Source: World Bank (2020), Author's Construct. Software: Microfit 5.5

4.5. Diagnostic Tests

Various diagnostic tests were performed to check for the robustness of the results. The diagnostic tests results are shown in Table 7. The diagnostic tests results indicate that the model passed all diagnostic tests (i.e. serial correlation, functional form, normality and heteroscedasticity test) suggesting the model in general is robust, consistent and reliable.

Table 7: Diagnostic Tests

Test Statistics	LM Version	P-Value
Serial Correlation	1.382	0.240
Functional Form	1.469	0.225
Normality	1.393	0.498
Heteroscedasticity	0.478	0.489

Source: World Bank (2020), Author's Construct. Software: Microfit 5.5

5.0. Conclusion and Recommendation

The study used historical data covering the period of 1967 to 2018 and ARDL estimation technique to analyze the impact of government expenditure and free maternal healthcare policy on household consumption expenditure in Ghana in the short run and long run. The findings revealed that government expenditure and free maternal healthcare policy had a negative and statistically significant effect of on household consumption expenditure in Ghana in both long run and short run. The result suggests that government expenditure and free maternal healthcare policy crowed-out private consumption in Ghana. Furthermore, the results indicated a positive and statistically significant effect of income on household consumption expenditure. That is, the marginal propensity to consume in the long run is 0.69 while the marginal propensity to consume in the short run is 0.214. This result suggests that real income have much higher effect on household consumption in the long run than in the short run.

The findings from the study have important implications not only for the Ghanaian economy but also for other developing countries. In addition, the results from this study have implications for household savings and interest rate. Since household consumption decreases with increased government expenditure and free maternal healthcare policy, the household members will have the opportunity to increase their savings and so interest rate falls. More so,

the study suggests the need to increase public spending on basic social amenities and also extend the free maternal healthcare policy to all pregnant women especially those in the rural areas of Ghana as these have a greater impact on household consumption in Ghana. The current study contributes to empirical literature it is the first empirical study to examine the impact of government expenditure and free maternal healthcare policy on household consumption expenditure in Ghana using the ARDL technique. Ghana introduced a free senior high school education policy in 2017 so who are interested in a similar study can analyze the implications of the free senior high school policy for household consumption in Ghana.

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Table 8: Household Consumption in Ghana by Product/Service and Area in US$ (Million)

Product/Service	Urban	Rural	National
All Products and Services	12067.47	5508.969	17576.44
Rice	386.5851	196.1355	582.7205
Other Cereals, Flour and Other Products	215.4022	291.7519	507.1541
Bread	267.037	102.0424	369.0794
Other Bakery Products	47.71054	14.26305	61.9736
Beef and Veal	18.27053	2.203478	20.47401
Pork	16.6495	10.47501	27.12452
Lamb, Mutton and Goat	285.9742	98.56131	384.5355
Poultry	104.8257	52.84219	157.6679
Other Meats and Meat Preparations	17.91072	17.41546	35.32618
Fresh, Chilled or Frozen Fish and Seafood	201.2312	116.4688	317.7
Preserved or Processed Fish and Seafood	614.1391	507.5583	1121.697
Fresh Milk	3.659098	3.328855	6.987954
Preserved Milk and Other Milk Products	156.6766	40.20452	196.8811
Cheese	0.51378	0.565322	1.079102
Eggs and Egg-Based Products	69.71596	22.47389	92.18986
Butter and Margarine	8.15656	12.08514	20.2417
Other Edible Oil and Fats	187.2361	103.0672	290.3033
Fresh or Chilled Fruit	326.9467	202.6247	529.5714
Frozen, Preserved or Processed Fruit and Fruit-based Product	106.2784	108.4249	214.7032
Fresh or Chilled Vegetables Other than Potatoes	518.092	331.61	849.702
Fresh or Chilled Potatoes	497.7065	531.8872	1029.594
Frozen, Preserved or Processed Vegetables and Vegetable-based Product	65.12808	25.09895	90.22704
Sugar	46.27337	36.95492	83.22829
Jams, Marmalades and Honey	2.454474	0.71495	3.169424
Confectionery, Chocolate and Ice Cream	37.08493	6.614369	43.6993
Food Products	166.4293	103.0484	269.4777
Coffee, Tea and Cocoa	85.20237	24.56863	109.771
Mineral Waters, Soft Drinks, Fruit and Vegetable Juices	147.2942	25.26585	172.56
Spirits	83.35408	73.34987	156.7039
Wine	8.32319	1.900208	10.2234
Beer	74.78914	30.99881	105.788
Tobacco	8.090482	14.5684	22.65888
Clothing Material, Other Articles of Clothing and Clothing Accessories	135.0663	63.1077	198.174
Garments	533.5871	266.4612	800.0482
Cleaning, Repair and Hire of Clothing	36.15734	16.75468	52.91202
Shoes and Other Footwear	157.913	72.79375	230.7068
Repair and Hire of Footwear	12.89595	4.260262	17.15621
Actual and Imputed Rentals for Housing	389.5453	97.68793	487.2333
Maintenance and Repair of the Dwelling	131.8027	82.9216	214.7243
Water Utility	209.9615	30.15551	240.1171
Miscellaneous Services Relating to the Dwelling	53.48626	5.42497	58.91123

Electricity	299.8896	40.2492	340.1388
Gas	45.89768	3.11483	49.01251
Other Fuels	296.4476	217.8212	514.2689
Furniture and Furnishings	97.56106	27.95214	125.5132
Repair of Furniture, Furnishings and Floor Coverings	0.950575	0.231037	1.181612
Household Textiles	35.42792	20.82296	56.25087
Major Household Appliances Whether Electric or Not	120.0898	25.21244	145.3023
Small Electric Household Appliances	5.111433	2.242919	7.354352
Repair of Household Appliances	3.18307	0.503499	3.686569
Glassware, Tableware and Household Utensils	38.31906	27.20105	65.52012
Major Tools and Equipment	6.901404	13.32793	20.22933
Small Tools and Miscellaneous Accessories	17.30588	8.783225	26.08911
Non-Durable Household Goods	193.8156	115.236	309.0516
Domestic Services	22.52956	0.424012	22.95357
Household Services	2.139363	0.801921	2.941284
Pharmaceuticals Products	100.8343	60.72976	161.5641
Other Medical Products	1.778273	0.347773	2.126046
Therapeutic Appliances and Equipment	2.547653	0.261562	2.809215
Medical Services	20.36763	11.46582	31.83345
Dental Services	1.090409	0.222065	1.312474
Paramedical Services	33.32787	13.19098	46.51885
Hospital Services	7.59809	8.050193	15.64828
Motor Cars	383.6245	58.34763	441.9721
Motorcycles	16.48614	11.65506	28.1412
Bicycles	6.658883	10.70366	17.36254
Fuels and Lubricants for Personal Transport Equipment	255.805	47.49045	303.2955
Maintenance and Repair of Personal Transport Equipment	41.33253	10.60355	51.93608
Other Services in Respect of Personal Transport Equipment	6.945905	3.610629	10.55653
Passenger Transport by Railway	0.038003	0.04093	0.078933
Passenger Transport by Road	477.587	162.1821	639.7692
Passenger Transport by Air	75.72527	1.82E-07	75.72527
Passenger Transport by Sea and Inland Waterway	0.952588	2.42591	3.378498
Postal Services	4.679541	0.574964	5.254504
Telephone and Telefax Equipment	1.034678	0.188908	1.223585
Telephone and Telefax Services	325.5282	53.85626	379.3845
Audio-Visual, Photographic and Information Processing Equipment	178.4765	37.74036	216.2169
Recording Media	6.139934	0.227964	6.367898
Repair of Audio-Visual, Photographic and Information Process. Equipment	1.257576	0.127598	1.385175
Major Durables for Outdoor and Indoor Recreation	1.04601	0.038225	1.084235
Maintenance and Repair of Other Major Durables for Recreation and Culture	0.020701	0.003116	0.023817
Other Recreational Items and Equipment	2.552135	0.451638	3.003772
Garden and Pets	2.159159	6.902143	9.061302
Veterinary and Other Services for Pets	7.08906	3.21258	10.30164

Recreational and Sporting Services	3.994995	0.867688	4.862683
Cultural services	12.84312	4.351706	17.19483
Games of chance	16.09679	21.98771	38.0845
Newspapers, Books and Stationery	67.72962	15.63046	83.36008
Package Holidays	10.8946	1.288149	12.18275
Education	1161.012	295.3444	1456.356
Catering Service	725.5446	210.2966	935.8412
Accommodation Services	3.737964	0.514648	4.252612
Hairdressing Salons and Personal Grooming Establishments	155.6808	50.91339	206.5942
Appliances, Articles and Products for Personal Care	203.9388	100.8035	304.7423
Jewellery, Clocks and Watches	7.476779	2.395095	9.871874
Other Personal Effects	51.20671	27.59707	78.80377
Social Protection	3.727642	1.476619	5.204261
Insurance	31.27179	7.273339	38.54513
Other Financial Services	20.99475	4.901042	25.8958
Other Services	6.366009	3.913423	10.27943

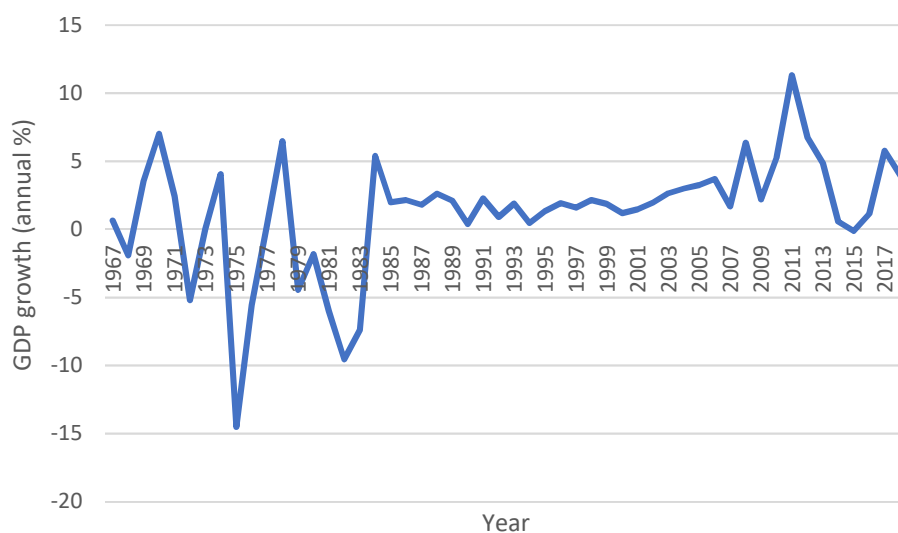Source: World Bank (2020), GSS (2007).

Appendix

Figure 4: Trends in GDP growth in Ghana (annual %) (1967-2018)

Source: World Bank 2020