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Growth Effects of Financial Market Instruments: The Ghanaian Experience [1]

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Ekundayo P. Mesagan
Department of Economics, School of Management and Social Sciences,
Pan-Atlantic University, Lagos, Nigeria.
Corresponding Author: profdayoms@yahoo.com

Isaac A. Ogbuji
Department of Finance, University of Lagos, Nigeria.
chibuike3014@gmail.com

Yasiru O. Alimi
Department of Economics, University of Lagos
haleemphemy480@gmail.com

Anthonia T. Odeleye
Department of Economics, University of Lagos, Nigeria.
antileye@yahoo.com

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Research Department

Growth Effects of Financial Market Instruments: The Ghanaian Experience

Ekundayo P. Mesagan, Isaac A. Ogbuji, Yasiru O. Alimi & Anthonia T. Odeleye

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Abstract

This study analyses the growth effects of financial market instruments in Ghana between 1991 and 2017. We use the ARDL bounds testing approach to analyse data on real GDP per capita, monetary policy rate, treasury bill rate, stocks traded, bank credits, stock turnover, market capitalisation, foreign direct investment, and gross investment. Findings show the existence of a long-run relationship between both short- and long-term financial market indicators and economic growth. Also, results confirm that long-term financial instruments perform better than the short-term instruments in boosting the country's economy in the short-run, while in the long-run, both short-term and long-term financial indicators positively impact economic growth in Ghana. We recommend that the bank of Ghana should consider lowering the bank rate further from the current annual rate of 16.0% to enhance bank credits, boosts domestic investment, and improve growth in the long-run.

Keywords: Financial Market Instruments, Market Capitalisation, Economic Growth, ARDL Bounds Test.

JEL Classification: E13, E43, E51, G20, O47.

1. Introduction

The achievements of the Ghanaian economy in the just concluded Millennium Development Goals (MDGs)[2] implementation have been reported to be mixed (United Nations in Ghana, 2015). This is so because few policy targets were achieved from the country's adopted and relevant set of 17 targets and 36 indicators out of the 21 millennium targets and 60 indicators. Specifically, the report revealed that slow progress was made in the area of full economic advancement in terms of productivity. The slow progress is associated with the country's low output growth[3] (United Nations in Ghana, 2015; Eregha & Mesagan, 2019). One of the factors militating against growth stability in Ghana is the exclusion of the poor from low-cost finance. The Ghanaian financial market has witnessed a major setback due to depositors' funds misappropriation by DKM Diamond Microfinance Limited where many customers still struggle to secure their lives back. Again, nine banks[4] were declared under capitalised in April, 2017 by the country's apex bank (Bank of Ghana, 2018).The challenges facing the country can be ameliorated if the financial market can be properly developed as it can help to channel idle financial resources to the real sector to enhance manufacturing activities (Durusu-Ciftci *et al.*, 2017; Eregha *et al.,* 2015; Omojolaibi *et al.,* 2016; Mesagan, Alimi & Yusuf, 2018; Asongu & Odhiambo, 2019).

According to Isola and Mesagan (2016), developing the money and capital markets is crucial for advancing economic progress. The money market is where short-term debts like treasury bills, commercial bills and others are traded to meet the short-term obligations of the fund users. On the other hand, the capital market is where long-term equity and debt capital are raised for long-term investment (Jalloh, 2009; Mesagan and Amadi, 2017).Thus, well developed financial institutions help to improve savings and investments as well as generates financial resources to stimulate output growth (Gibson and Tsakalotos,1994; Mesagan and Nwachukwu, 2018).The origin of the financial development-growth nexus can be traced back to the seminar work of Schumpeter (1911) who draws attention to the importance of financial markets on the growth of every economy as they play significant role in the allotment of financial resources. Again, Greenwood and Jovanovich (1990) opined that financial institutions provide avenue for the poor to access capital at a reduced cost in order to earn

[2] The MDGs, which was approved in September 2000, comprise eight policy targets that were adopted by 189 heads of state and governments who gathered at the United Nations headquarters in New York and that aimed towards improving human welfare in terms of health, education, shelter and security.
[3] According to the World Bank (2017), the average growth rate of GDP per capita from 1991 to 2015 is 2.96%.
[4] The issues with two of these banks have been resolved through a Purchase and Assumption transaction with the GCB Bank to prevent spill-over to other bank and the economy at large.

high yield on investment. Empirically, studies like Goldsmith (1969), McKinnon (1973), Shaw (1973), Cooray (2010),Levine and Zervos (1996), Beck and Levine (2004) contend that financial market development has a direct link with output growth. However, studieslike Snigh (1997), Nili and Rastad (2007), Naceur and Ghazouani (2007), Narayan and Narayan (2013), Owusu and Odhiambo (2014a), Rioja and Valev (2014) and Mesagan, Olunkwa and Yusuf (2018) assert that financial market development has a negative and insignificant impact on economic growth in developing countries. The mixed or inconclusiveness of outcomes from these studies are due to variables measurement and econometrics approaches. Hence, the study investigates the link between financial market instruments and output growth in Ghana.

The study differs from previous studies in the following ways. Firstly, looking at financial market development in recent decades, it is observed the few available studies on the financial market and growth often neglect the discourse on both the short-term and long- term financial market instruments. However, the nature of financial market instruments is very crucial in pinpointing the growth impact of financial market. Thus, omitting it as previous empirical studies have done makes their results to produce a less comprehensive assessment of the effect of financial market on growth. This present study fills this noticeable gap and extends the frontiers of knowledge by incorporating both short-term and long-term financial instruments into the growth model. Also, going by the fact that short-term tools like treasury bills are used by the government to carter for short-term fiscal responsibilities in developing countries, this study becomes expedient. Moreover, since the financial sector comprises the banking sector, money and capital market, and the banking sector plays a major role in stimulating the Ghanaian economy, yet, the importance of both money and capital markets can not be neglected. Therefore, we control for the three sectors of financial market in this study to obtain a more comprehensive result. Again, despite that our core interest centres on the financial instruments in Ghana, whether short- or long- term, we proceed further to analyse the growth effects of the country's financial indicators in both the short- and long-run using the ARDL.

Moreover, Ghana has experienced major changes in her financial market policies in recent times and it is a bank-based financial system. For instance, the Monetary Policy Committee (MPC), which is the monetary head of the Bank of Ghana, reduced its monetary policy rate by 100 basis points from 17.0% to a five-year low rate of 16.0% in January 2019 (BOG, 2019). Hence, there is the need to assess the effect of its financial market in promoting growth. Again, the country recently received financial credit support of $30 million from the World Bank in last quarter of 2018to assist the government in strengthening the country's financial sector, mostly women, farmers and rural dwellers that are financially excluded (World Bank, 2018).So, this study is useful in formulating policies to achieve the set goals of the World Bank for the country. Since the study has a small sample with the scope of 1991 to 2017, we employ the autoregressive distributed lag (ARDL) model. The method is more efficient for studies with limited and small sample sizes, and applicable where the regressors are endogenous (Pesaran *et al.*, 2001; Haug, 2002; Narayan and Smyth, 2005). Also, it is an improvement over previous studies that relied on the residual-based cointegration test connected with the Engle and Granger (1987) and the maximum likelihood test linked with Johansen and Juselius (1990). Thus, for the structure of this study, section two reviews relevant literatures, section three presents the methodology, section four presents the empirical analysis and discussion, while section five concludes the study.

2. Literature Review

Empirical studies that examined the nexus between financial market development and output growth mostly used both the bank and stock market variables while less emphasis is placed on the money market variables most especially the short-term debt instruments like treasury bills. Findings from several studies that beamed searchlight on the nexus between capital market and economic growth are mixed and inconclusive. Studies such as Obstfeld (1995), Levine (1997), Bonfiglioli and Mendicino (2004), Vazakidis and Adamopoulos, (2009), Mesagan *et al.,* 2019, among others found a positive link between the financial market and economic growth whereas Grilli and Milesi-Ferretti (1995), Eichengreen and Leblang (2003), and Echekoba*et al.* (2013) reported a negative relationship. For instance, Levine (1997) confirmed that the financial sector enhancedoverall output growth in the long run. Specifically, the study revealed that capital market improved economic growth through creation of liquidity and internationally integrated stock markets. This finding is supported by Obstfeld (1995).Moreover, Vazakidis and Adamopoulos (2009) found that stock market development positively and significantly enhanced economic growth in France between 1965 and 2007 while Mishra *et al.* (2010)used quarterly data and confirmed significant relationship between capital market efficiency and output growth in India between 1991 and 2010.Similarly, Bolbol *et al.* (2005) observed that capital market development contributed significantly to economic performance of Egypt.

Moreover, for studies focusing on the nexus between stock market and economic growth, Azarmi *et al.* (2005) focused on the pre- and post-liberalisation periods between 1981 and 2001 in India. Findings showed that stock market negatively but significantly impacted economic growth during the post-liberalisation periods between 1991 and 2001 the effect was positive for the entire period of 1981 to 2001. However, causal relationship was not found between both for the considered periods. For Shahbaz *et al.* (2008), a long-run relationship was found between the stock market and output growth in Pakistan between 1971 and 2006. Also, the stock market positively and significantly enhanced economic growth. Vazakidis and Adamopoulos (2009) investigated the situation in France between 1965 and 2007 and found a unidirectional causal nexus running from output growth to the stock market. For some Sub-Saharan African countries, Enisan and Olufisayo (2009) confirmed that economic growth caused stock market performance in Egypt and South Africa whereas a bidirectional causal relationship was confirmed in Cote D'Ivoire, Kenya, Morocco and Zimbabwe. The result for Nigeria showed a weak evidence of growth causing the stock market. Specifically focusing on Nigeria between 1987 and 2014, Owusu (2016)found that the stock market had mixed impact on economic growth. Aboudou (2009) focused on the West African Monetary Union countries and found that capital market determined economic growth in the region.

Regarding the strand of studies on the Ghanaian economy, Osei (2005) used a quarterly data from 1991 to 2003 and showed that stock market development enhanced output growth. Also, Quaidoo (2011) used quarterly data from 1991-2006 and confirmed that a long-run relationship was found between market capitalisation and economic growth and that economic growth unidirectionally caused market capitalisation. Dziwornu and Awunyo-Vitor (2013) focused on the period of 1990 to 2012 and reported that the capital market unidirectionally caused economic growth. Owusu and Odhiambo (2014a) employed the bounds testing approach to investigate the impact of capital market development on sustainable growth. The findings revealed that capital market development had no impact on economic growth both in the short-run and long-run. They also confirmed that although the domestic credit to the private sector enhanced sustainable growth in Ghana, the capital market did not. The studies of Asante *et al.* (2011), Acquah-Sam and Salami (2014), and Adusei (2014) also found that capital market enhanced the development of the Ghanaian economy.

Having reviewed the empirical literature, it is obvious that while few studies like Grilli and Milesi-Ferretti (1995), Levine (1997), Eichengreen and Leblang (2003), Bonfiglioli and Mendicino (2004), Vazakidis and Adamopoulos, (2009), and Echekoba *et al.* (2013) beamed searchlight on financial market development and growth, they often neglect the discourse on both the short-term and long-term financial market instruments. Therefore, since the nature of financial market instruments is important in analysing the growth impact of financial market, it is accounted for in this study. Hence, we provide a more comprehensive assessment of the effect of financial market on growth by incorporating both short-term and long-term financial instruments into the growth model. Moreover, by controlling for short-term instruments like treasury bills, which were often ignored in studies like Bolbol*et al.* (2005), Azarmi *et al.* (2005), Shahbaz *et al.* (2008), Vazakidis and Adamopoulos (2009), as well as, Enisan and Olufisayo (2009), despite their use by the government to carter for short-term fiscal responsibilities in developing countries, our study is novel and contributes to the literature.

3. Methodology

The development of financial markets through the implementation of both short- and long-term financial instruments is expected to boost the output growth of every economy. Following this assertion, we specify the model to evaluate the case of Ghanaian economy. Thus, following studies like Beck *et al.* (2000) and Owusu and Odhiambo (2014b), we specify the empirical model where economic growth is a function of financial market instruments and other control variables. This include short-term instruments like monetary policy rate, treasury bills rate, total liquidity; and long-term instruments like domestic credit to the private sector, total values of stock traded and stock turnover. The control variables include the gross fixed capital formation and foreign direct investment while economic growth is captured with the real GDP per capita. Thus, the model becomes:

$$PCI_t = \alpha_0 + \mathrm{B}'FSD_t + \beta_1 CAP_t + \beta_2 FDI_t + \mu_t \qquad (1)$$

PCI denotes real income per capita and *FSD* is a vector of both short- and long- term instruments. The short-term instruments include monetary policy rate (*MPR*), treasury bills rate (*TBR*) and total liquidity measured by broad money (that is short-term time deposit and money market funds) as a ratio of GDP (*TL*). Meanwhile, the long-term instruments are measured with domestic credit to private sector as a ratio of GDP (*DCPS*), market capitalization as a ratio of GDP (*MC*), total values of stock traded as a ratio of GDP(*STG*) and stock market turnover (*SMT*). Further, *CAP* represents gross fixed capital formation as a ratio of GDP while *FDI* denotes foreign direct investment (net inflows) as a ratio of GDP. Besides, α_0 is a constant, B' is a vector of coefficients of both short- and long- term financial development indicators, β_1, β_2 are parameters of capital and FDI, t denotes time, and μ_t is the stochastic term at time t.

The ARDL approach, developed by Pesaran *et al.* (2001), based on the unrestricted error correction technique is employed in this study since it covers a period of 25 years, and it is expressed as follows:

$$\begin{aligned}\Delta PCI_t &= C_1 + \sum_{i=1}^{p}\delta_i \Delta PCI_{t-i} + \sum_{i=1}^{p}\phi_i' \Delta FSD_{t-i} + \sum_{i=1}^{p}\eta_i \Delta CAP_{t-i} + \sum_{i=1}^{p}\lambda_i \Delta FDI_{t-i} \\ &+ \varpi_1 PCI_{t-1} + \pi_i' FSD_{t-1} + \varpi_2 CAP_{t-1} + \varpi_3 FDI_{t-1} + e_t\end{aligned} \quad (2)$$

Where: Δ is the first difference operator; π, ϖ_{1-3} are long-run multipliers corresponding to long-run relationships; C_1 is drift; $\delta_i, \phi_i', \eta_i, \lambda_i$ are the short run dynamic coefficients of the underlying ARDL model in the equation; and e_t is white noise error at time *t*.Equations (1) and (2) present the full model and the models are further specialised and considered in simpler variants, subsequently in section 4 of this study.

The first process is to estimate the ARDL model using the ordinary least square in order to find whether there exists a long-run relationship among the variables (Owusu and Odhiambo 2014a; Mesagan, Alimi and Adebiyi, 2018). Subsequently, a Wald test of joint significance of lagged levels of our variables is tested to reject or not to reject the null hypothesis of no long-run relationship among the variables in the equation. The following null and alternative hypotheses tested are: $H_0 : \pi_i', \varpi_1, \varpi_2, \varpi_3 = 0$ [i.e. no cointegration or non-existence of long-run relationship] against $H_1 : \pi_i', \varpi_1, \varpi_2, \varpi_3 \neq 0$ [i.e. cointegration or existence of long-run relationship]. The values of the calculated F-statistic are checked with both the upper and lower bounds values of Narayan and Smyth (2005). The null hypothesis of no cointegration is rejected, if the computed F-statistics is greater than the upper critical value and accepted if otherwise. It is however, inconclusive if the computed F-statistics lies between the two critical bounds. Afterward, the second process is to estimate the long-run parameter estimates with their optimum order selected by AIC or SBC after establishing that a co-integration exists among the variables of interest. According to Pesaran, Shin and Smith (2001), the estimator has the following inherent advantages to other estimation approaches. The method is relatively simple and also employs the OLS techniques to test the long-run relationship. Irrespective of whether the unit root tests of the datasets are at levels or first difference or the combination of both, the existences of the co-integration can be tested. Also, it is more efficient for studies with finite and small samples because of its inherent strength to accomodate studies with a few observations without being biased. Lastly, it is applicable where the regressors are endogenous.

The study employs annual time series data spanning 1991 to 2017, which captures the periods of financial liberalisation in Ghana. The data are sourced from the Bank of Ghana statistical bulletin (BOG, 2019) and World Development Indicators (WDI, 2019). Regarding apriori expectation, for short-term instruments like MPR, TBR, and liquidity,the study expects monetary policy rate to exert a negative impact on growth as it increases the cost of doing business, thereby creating bottlenecks for fund allocation to productive sources. This may retard the growth of an economy. Treasury bills rate can positively or negatively impact growth depending on the situation. For instance, TBR may retard growth as investors are likely to become risk-averse if it is higher than the rate of all other debt instruments. It may enhance growth as the total par value (purchase price plus interest) is available to allocate economic resources towards increase in output. Liquidity is expected to boost output growth by boosting overall economic activity. For the long-term financial market instruments; stock market turnover, the value of stock traded, and bank credit are expected to boost economic growth because they raise the incentive to invest. The total market capitalisation is expected to positively impacts growth since it helps to boost the capital base of the listed firms and subsequently increase investment. Also, gross capital formation and foreign direct investment are expected to positively impact the real GDP per capita.

4. Empirical Results

4.1 Pre-estimation Analysis

Table 1 presents the descriptive statistics of the variables. The average growth rate of real income per capita is 2.96% within the period considered, depicting low level of output growth. The mean value of short-term financial market indicators (i.e. monetary policy rate, treasury bills rate and total liquidity) is 24.64%, 25.91% and 26.90% respectively. In respect of the long-term financial market indicators, the average value of domestic credit to private sector, market capitalisation, total value of stock traded, and stock market turnover is 11.71%, 10.72%, 0.42% and 5.43% correspondingly. It means that on the average, long-term financial market instruments are lower than those of the short-term.

Table 1: Description of variables and descriptive statistics

Variables	Measurement	Mean	Std. Dev.	Max.	Min.
PCI	GDP per capita growth (annual %)	2.958	2.343	11.252	0.568
MPR	Monetary policy rate (annual rate)	24.640	10.408	45	12.5
TBR	Treasury bills rate (91 days, %)	25.905	11.495	47.88	9.6
TL	Total liquidity (broad money, % of GDP)	26.904	5.143	34.108	15.563
DCPS	Domestic credit to private sector (% of GDP)	11.712	4.603	19.368	3.657
MC	Market capitalization (% of GDP)	10.722	7.979	34.886	1.151
STG	Value of stock traded (% of GDP)	0.421	0.314	1.267	0.010
SMT	Stock market turnover (%)	5.429	3.539	15.183	0.974
CAP	Gross fixed capital formation (% of GDP)	22.943	4.079	30.927	12.736
FDI	Foreign direct investment (net inflows, % of GDP)	4.116	3.183	9.517	0.303

Note: GDP is gross domestic product; Std. Dev. is standard deviation; Max. – maximum; Min. – minimum; Number of observation is 25 years; PCI – per capita income; TBR – treasury bill rate; MPR – monetary policy rate; TL – total liquidity; DCPS – domestic credit to private sector; MC – market capitalization; STG – stock traded value; SMT – stock market turnover; CAP – capital; and FDI – foreign direct investment.
Source: Authors' compilation (2019).

Table 2 shows the results of the partial correlation of the variables. The outcome shows an indirect relationship between short-term financial instruments and per capita income, while long-term financial instruments have direct relationship with income per capita except market capitalisation. In addition, evidence from the correlation matrix indicates multi-collinearity is not a problem in this study.

Table 2: Correlation Matrix

	TBR	MPR	TL	DCPS	MC	STG	SMT	CAP	FDI
PCI	-0.484	-0.537	-0.264	0.349	-0.233	0.133	0.382	0.379	0.511
TBR	1	0.506	0.439	-0.507	0.553	-0.102	-0.572	-0.209	-0.353
MPR		1	0.353	-0.645	0.585	-0.020	-0.535	-0.269	-0.509
TL			1	-0.386	0.231	0.025	-0.367	-0.454	-0.197
DCPS				1	-0.239	0.182	0.589	0.522	0.718
MC					1	0.524	-0.274	0.008	0.050
STG						1	0.484	0.259	0.262
SMT							1	0.559	0.363
CAP								1	0.314

Note: PCI – per capita income; TBR – treasury bill rate; MPR – monetary policy rate; TL – total liquidity; DCPS – domestic credit to private sector; MC – market capitalization; STG – stock traded value; SMT – stock market turnover; CAP – capital; and FDI – foreign direct investment.
Source: Authors' compilation (2019).

In Table 3, we present the result of the unit test to determine the stationarity of the regressors. Thus, Table 3 suggests that income per capita, monetary policy rate, treasury bill rate, domestic credit to the private sector, market capitalisation, stock market turnover, and foreign direct investment are not stationary at levels but are all stationary at first differences. However, total liquidity, total value of traded stock and capital investment are stationary at levels. The outcome of the unit root test confirms the suitability of the ARDL bounds test in this study.

Table 3: ADF unit root tests for the variables at levels and first differences

Variables	Levels		First Difference		Results
	No Trend	Trend	No Trend	Trend	
PCI	-2.6935	-3.2011	-6.3315***	-6.2701***	I(1)
MPR	-1.5370	-2.0666	-3.6476**	-3.7326**	I(1)
TBR	-1.7140	-2.5623	-4.9227***	-3.9719***	I(1)
TL	-4.1872***	-4.5121***	-	-	I(0)
DCPS	-1.0056	-2.6899	-5.7674***	-5.6276***	I(1)
MC	-2.7388	-3.0047	-5.6153***	-5.5326***	I(1)
STG	-5.2361***	-5.0942***	-	-	I(0)
SMT	-2.4282	-3.4695	-5.4035***	-5.2887***	I(1)
CAP	-3.3485**	-3.7586**	-	-	I(0)
FDI	-1.0256	-2.3497	-4.0891***	-3.9858***	I(1)

Note:*, ** and * denotes significance level at 1%, 5% and 10% respectively.PCI – percapita income; TBR – treasury bill rate; MPR – monetary policy rate; TL – total liquidity; DCPS – domestic credit to private sector; MC – market capitalization; STG – stock traded value; SMT – stock market turnover; CAP – capital; and FDI – foreign direct investment. **Source:** Authors' computation (2019).

In Table 4, we select the orders of the ARDL models using the Akaike Info Criterion (AIC). The table shows that the calculated F-statistics are greater than the upper bound critical values indicating that the null hypotheses of no cointegration are rejected at 5% significance level. Thus, it implies that there is evidence in support of a unique and stable long-run relationship between the short- and long- term financial market indicators and economic growth in Ghana.

Table 4: Result of ARDL bounds test for cointegration relationship

Dependent variable: PCI	**Functions**	**F-statistics**
Model 1 ARDL (1,2,1,1)	$F_{PCI}(PCI \mid MPR, CAP, FDI)$	5.5911***
Model 2 ARDL (1,1,2,2)	$F_{PCI}(PCI \mid TBR, CAP, FDI)$	5.8543***
Model3 ARDL (2,0,0,2)	$F_{PCI}(PCI \mid TL, CAP, FDI)$	4.5854**
Model 4 ARDL (1,2,2,1,2,2)	$F_{PCI}(PCI \mid MPR, TBR, TL, CAP, FDI)$	4.6007**
Model 5 ARDL (1,2,1,1)	$F_{PCI}(PCI \mid DCPS, CAP, FDI)$	5.0010**
Model 6 ARDL (1,2,2,2)	$F_{PCI}(PCI \mid MC, CAP, FDI)$	4.5436**
Model 7 ARDL (2,1,1,2)	$F_{PCI}(PCI \mid STG, CAP, FDI)$	4.5259**
Model 8 ARDL (1,1,2,2)	$F_{PCI}(PCI \mid SMT, CAP, FDI)$	4.7120**
Model 9 ARDL (2,2,2,1,2,2)	$F_{PCI}(PCI \mid MC, STG, SMT, CAP, FDI)$	4.4829**

	1%		**5%**		**10%**	
	I(0)	*I(1)*	*I(0)*	*I(1)*	*I(0)*	*I(1)*
Critical bound values for models 1, 2, 3, 5, 6, 7, &8	4.29	5.61	3.23	4.35	2.72	3.77
Critical bound values for Model4	3.41	4.68	2.62	3.79	2.26	3.35
Critical bound values for Model 9	2.33	3.52	2.79	4.15	3.98	5.69

Note: ***, ** and * denote rejection of null hypothesis at 1%, 5% and 10% significance levels respectively.
Source: Authors' computation (2019).

4.2Analysis of Results and Discussion

In Table 5 (a & b), we present the empirical results of both the long-run and short-run for this study while Table 6 presents that of the diagnostic/stability test results. Also, models 1-4 report the individual and joint relationship between the coefficients of short-term financial market indicators and real income per capita while models 6-9 report the estimates of the long-term financial instruments. The short-run results suggest that long-term financial instruments performed better in enhancing output growth than the short-term financial indicators in the short-run. Specifically, three financial indices of long-term financial instruments (i.e. domestic private sector credits, stock traded, and stock market turnover) positively and significantly influence per capita income growth in the short-run and in the long run. The robustness of these results is confirmed as we obtain similar results when regressed individually and when they are regressed jointly.

Table 5: Results of the estimated ARDL long-run coefficients

Variables	1	2	3	4	5	6	7	8	9
	Dependent Variable: Real income per capita								
	(a) Long-run estimates								
Constant	-6.930*** (0.266)	-5.954*** (0.828)	- 0.629(1.525)	-6.504 (7.784)	-3.006** (1.342)	3.717* (1.906)	5.677* (3.287)	5.213** (1.926)	5.493*** (1.941)
MPR	0.021*** (0.0013)			0.0094* (0.0051)					
TBR		0.0059* (0.0033)		0.024** (0.011)					
TL			0.039** (0.019)	0.043* (0.026)					
DCPS					0.0244* (0.0241)				0.107*** (0.015)
MC						0.0426 (0.060)			-0.616 (0.758)
STG							3.624** (1.628)		0.132*** (0.023)
SMT								0.074 (0.076)	0.620 (0.463)
CAP	0.303*** (0.010)	0.289*** (0.032)	0.126*** (0.041)	0.014 (0.018)	0.156** (0.067)	-0.121 (0.237)	-0.162 (0.132)	0.270*** (0.095)	0.897*** (0.119)
FDI	0.553*** (0.002)	0.507*** (0.048)	0.461*** (0.017)	0.496*** (0.114)	0.478*** (0.017)	0.264*** (0.088)	0.513*** (0.082)	0.490*** (0.024)	0.115* (0.064)
	(b) Short-run estimates								
ΔPCI	0.3001*** (0.0302)	0.576*** (0.084)	0.396*** (0.036)	0.192*** (0.065)	0.404*** (0.067)	0.297 (0.230)	0.958*** (0.111)	0.309*** (0.018)	0.111** (0.51)
ΔMPR	-0.222*** (0.003)			-0.018* (0.010)					
ΔTBR		-0.027*** (0.0033)		-0.165** (0.019)					
ΔTL			0.025 (0.019)	0.006 (0.064)					
ΔDCPS					0.247*** (0.059)				0.329* (0.171)
ΔMC						0.110 (0.065)			0.196 (0.124)
ΔSTG							0.467*** (0.049)		0.221** (0.121)
ΔSMT								0.571*** (0.060)	0.781*** (0.093)
ΔCAP	0.126*** (0.007)	0.543** (0.086)	0.468*** (0.151)	0.261 (0.144)	0.326*** (0.054)	0.351** (0.127)	0.148* (0.085)	0.177*** (0.032)	0.296*** (0.097)
ΔFDI	-0.225*** (0.018)	0.141*** (0.025)	0.193*** (0.014)	0.141** (0.042)	0.126*** (0.016)	0.871** (0.348)	0.620*** (0.173)	0.465*** (0.010)	0.304** (0.128)
ECT(-1)	-0.124*** (0.011)	-0.818*** (0.011)	-0.396*** (0.129)	0.119** (0.033)	0.404*** (0.114)	-0.603** (0.23)	-0.205*** (0.049)	-0.496*** (0.025)	-0.260* (0.143)

Note: ***, ** and * denote rejection of null hypothesis at 1%, 5% and 10% significance levels respectively.PCI – percapita income; TBR – treasury bill rate; MPR – monetary policy rate; TL – total liquidity (broad money, % of GDP); DCPS – domestic credit to private sector (% of GDP); MC – market capitalization (% of GDP); STG – stock traded value (% of GDP); SMT – stock market turnover; CAP – capital (% of GDP); and FDI – foreign direct investment (% of GDP).
Source: Authors' computation (2019).

It thus means that all the long-term financial instruments used in this study enhance economic growth in the short- and long-run. Intuitively, this result is expected as more credits to the private sector make more money available for investment and capital accumulation. Also, as more stocks are traded and stock turnover increases in the Ghanaian stock market, listed firms have more funds to invest thereby boosting overall output in both the short-run and long-run.

Regarding the short-term financial instruments captured with monetary policy rate, treasury bills rate, total liquidity in Table 5 (a & b), the result shows that both MPR and TBR have negative impacts on growth in the short-run while liquidity has a positive impact. While both MPR and treasury bill rate are significant, liquidity rate has insignificant impact on growth in the short-run. In the long-run, all short-term instruments positively and significantly enhanced economic growth. The intuition is that in the short-run, increases in short-term instruments like the MPR and TBR increase the cost of capital leading to a fall in capital accumulation. This lowers aggregate output and reduces economic growth in Ghana. However, improvement in the liquidity rate free-up funds and make them available for investment thereby enhancing the growth rate of the Ghanaian economy. For the long-run, all short-term financial instruments improve economic growth. This is expected as foreign investors can take advantage of a high monetary policy and treasury bills rate to move their portfolio investment into the country. As more investment flows into the market, the exchange rate situation improves and the Ghanaian Cedi appreciates against foreign currencies. The initial short fall in investment is eroded as domestic firms can then obtain their foreign inputs cheaply, domestic output increases and the economy grows in the long-run. It thus means that although short-term financial instruments exert negative impacts on growth in the short-run, except for liquidity, they all contribute positively in the long-run to the Ghanaian economy.

The short-run results of the short-term financial instruments like monetary policy rate and treasury bills rate, which adversely affect the Ghanaian economy can be traced to the rigidity of the country's MPC to lower its bank rate until recently. Specifically, the country's Monetary Policy Committee only reduced its monetary policy rate by 100 basis points from 17.0% to 16.0% in January 2019 despite the call for a reduction for about five years. This study confirms that such rigidity in bank rate has a short-run debilitating impact on the country's economy. The findings of the short-term indicators are in synch with those of

Agyapong and Adam (2011), Quaidoo (2011), Dziwornu and Awunyo-Vitor (2013), Acquah-Sam and Salami (2014) while the result of the long-term financial indicators is in tandem with that of Nyasha and Odhiambo (2016).The coefficients of the error correction term (ECT) at lag 1 presented in Table 5 are found to be negative and statistically significant at 5%, ranging within the magnitude of 11.9% and 81.8%. It implies that approximately between 11.9% and 81.8% disequilibrium of shock in the previous year of output growth converge to the current year's long-run equilibrium. This thereby supports the existence of long-run relationship equilibrium path between the short-term and long-term financial market indices and economic growth in Ghana.

Table 6: Model diagnostic and stability tests

Test statistics	**Dependent variable:** Real income per capita								
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
Serial correlation	0.056	0.100	0.688	3.173	0.421	0.253	1.175	0.017	2.395
	(0.946)	(0.906)	(0.520)	(0.129)	(0.671)	(0.782)	(0.340)	(0.984)	(0.186)
Functional form	1.312	1.972	1.845	1.226	1.023	0.814	1.897	1.439	2.129
	(0.209)	(0.072)	(0.086)	(0.266)	(0.301)	(0.433)	(0.079)	(0.172)	(0.247)
Normality	1.191	0.631	1.046	1.065	1.466	1.199	0.800	0.626	3.463
	(0.551)	(0.729)	(0.593)	(0.587)	(0.481)	(0.349)	(0.670)	(0.731)	(0.177)
Heteroskerdasticity	1.078	1.724	1.177	2.028	0.288	1.328	1.087	1.373	0.735
	(0.298)	(0.180)	(0.258)	(0.175)	(0.922)	(0.317)	(0.294)	(0.289)	(0.709)
CUSUM	Stable	Stable	Stable	Stable	Stable	Stable	Stable	Stable	Stable
CUSUMQ	Stable	Stable	Stable	Stable	Stable	Stable	Stable	Stable	Stable

Note: The values in brackets are the probability values for the diagnostic and stability tests. *** and ** denote rejection of null hypothesis at 5% and 10% significance levels respectively.
Source: Authors' computation (2019).

In Table 6, we present the diagnostic and stability test results. The diagnostic tests confirm that the estimated models are adequately specified and the regressions are not spurious. This is because their error terms have same variance, are normally distributed and are uncorrelated. Again, the results of the cumulative sum and cumulative sum of square fall within the critical bounds at 5% significance level indicating that the parameters are stable over the sample periods.

5. Conclusion

This paper empirically investigates the impacts of both short-term and long-term financial market instruments on economic growth in Ghana within the periods of 1991 and 2017. Although several studies have investigated the nexus between financial market development and economic growth but the scarcity of studies examining the effects of both short-term and long-term financial instruments necessitates this study on the Ghanaian economy. To this end, the study used the ARDL bounds testing approach to examine the short-run and long-run impacts of these indicators on economic growth and findings showed the existence of a unique and stable long-run relationship between financial development and economic growth in Ghana. Again, we confirmed that the long-term financial instruments positive enhanced economic growth in both the short-run and long-run while the short-term financial instruments positively impacted economic growth in the long-run but negatively affected growth in the short run, except for liquidity ratio. We therefore conclude that long-term financial instruments performed better than the short-term instruments in affecting economic growth in Ghana in the short-run. Whereas, in the long-run, both short-term and long-term financial indicators positively enhanced economic growth in Ghana. To this end, there is the need for the country to promote long-term financial market policies in order to enhance economic growth and development. In addition, policy makers should ensure appropriate formulation and implementation of short-term financial tools in order to foster economic growth. As identified in Mesagan and Shobande (2016), the apex banks have important role to play in stimulating the economies of developing nations, hence it is important for the Bank of Ghana to consider lowering the MPR further from the current 16.0%. This can help to further reduce the treasury bills rate and make more funds available to the private sector since the general bank lending rate will drop further than it is at present. A reduction in MPR will not only enhance bank credits and lower the TBR, it will also help to boost domestic investment, aggregate demand and lower inflationary pressures. The resultant effect on the Ghanaian economy in both the short-run and long-run will be massive.

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