

GROWTH EFFECTS OF FINANCIAL MARKET INSTRUMENTS: THE GHANAIAN EXPERIENCE

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ABSTRACT

This study analyses the growth effects of financial market instruments in Ghana between 1991 and 2017. We use the Autoregressive Distributed Lags (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. The findings show the existence of a long-term relationship between both short- and long-term financial market indicators and economic growth. Also, the results confirm that long-term financial instruments perform better than 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, boost domestic investment, and improve growth in the long run.

KEY WORDS

Financial market instruments, market capitalisation, economic growth, ARDL bounds test, Ghana.

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Introduction

The achievements of the Ghanaian economy in terms of the implementation of the just-concluded Millennium Development Goals (MDGs)¹ 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 in-

dicators. Specifically, the report revealed that slow progress was made in the area of full economic advancement in terms of productivity. Such slow progress is associated with the country's low output growth² (United Nations in Ghana, 2015). One of the factors hindering the stability of growth in Ghana is the exclusion of the poor from access to low-cost finance. The Ghanaian financial market has witnessed a major setback due to the misappropriation of de-

¹ The MDGs, which were 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 to improve human welfare in terms of health, education, shelter and security.

² According to the World Bank (2017), the average growth rate of GDP per capita from 1991 to 2015 is 2.96%.

positors' funds by DKM Diamond Microfinance Limited, where many customers are still struggling to rebuild their lives in the aftermath. Again, nine banks³ were declared undercapitalised 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 enhance manufacturing activities (Durusu-Ciftci et al., 2017; Eregba et al., 2015; Omojolaibi et al., 2016; Mesagan et al., 2018).

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 such as 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 generate 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 seminal work of Schumpeter (1911: 1934), which draws attention to the influence of financial markets on the growth of every economy as they play a significant role in the allotment of financial resources. Again, Greenwood and Jovanovich (1990) opined that financial institutions provide an avenue for the poor to access capital at a reduced cost in order to earn a high yield on investment. Empirically, studies such as those by Goldsmith (1969), McKinnon (1973), Shaw

(1973), Cooray (2010), Levine and Zervos (1996), as well as Beck and Levine (2004), contend that financial market development has a direct link with output growth. However, studies such as those by Snigh (1997), Nili and Rastad (2007), Naceur and Ghazouani (2007), Narayan and Narayan (2013), Owusu and Odhiambo (2014a), Rioja and Valev (2014) and Mesagan et al. (2018) assert that financial market development has a negative and insignificant impact on economic growth in developing countries. The mixed or inconclusive outcomes from these studies are due to variable 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 may be observed that the few available studies on the financial market and growth often neglect the discourse on both short-term and long-term financial market instruments. However, the nature of financial market instruments is crucial in pinpointing the impact of financial markets on growth. Thus, omitting it as previous empirical studies have done means their results produce a less comprehensive assessment of this effect. 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 finance-growth nexus model. Also, going by the fact that short-term tools such as treasury bills are used by the government to cater for short-term fiscal responsibilities in developing countries, this study becomes expedient. Moreover, since the financial sector comprises the banking sector, money and capital markets, while it is the case that the banking sector plays a major role in stimulating the Ghanaian economy, the importance of both money and capital mar-

³ 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 banks and the economy at large.

kets cannot be neglected. Therefore, we control for the three sectors of the financial sector in this study to obtain a more comprehensive result. Again, despite the fact that our core interest centres on financial instruments in Ghana, whether in the short or long term, we proceed to further 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 its financial market policies in recent times, and has 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 on promoting growth. Again, the country recently received financial credit support of \$30 million from the World Bank in the last quarter of 2018 to assist the government in strengthening the country's financial sector, mostly to support women, farmers and rural dwellers who are financially excluded (World Bank, 2018). This study is useful in formulating policies to achieve the goals set by the World Bank for the country. Since the study has a small sample within the scope of the period 1991-2017, we employ the ARDL bounds testing approach. 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 work by 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 the relevant literature; section three presents the

methodology; section four presents the empirical analysis and discussion; while section five concludes the study.

1. 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 was placed on the money market variables, especially short-term debt instruments such as treasury bills. Findings from several studies that placed the nexus between the capital markets and economic growth under the spotlight are mixed and inconclusive. Studies such as Obstfeld (1995), Levine (1997), Bonfiglioli and Mendicino (2004), Vazakidis and Adamopoulos (2009), and Mesagan et al. (2019) among others, found a positive link between the financial markets and economic growth, whereas Grilli and Milesi-Ferretti (1995), Eichengreen and Leblang (2003), and Echekeba et al. (2013) reported a negative relationship. For instance, Levine (1997) confirmed that the financial sector enhanced overall output growth in the long run. Specifically, the study revealed that the capital markets improved economic growth through the 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 to confirm a 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 the economic performance of Egypt.

Moreover, for studies focusing on the nexus between stock market and econom-

ic growth, Azarmi et al. (2005) focused on the pre- and post-liberalisation periods between 1981 and 2001 in India. Findings showed that the stock market negatively but significantly impacted economic growth during the post-liberalisation periods between 1991 and 2001, yet the effect was positive for the entire period of 1981 to 2001. However, a causal relationship was not found between both for the periods considered. 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 brought about a stronger 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 weak evidence for the existence of growth caused by the stock market. Specifically focusing on Nigeria between 1987 and 2014, Owusu (2016) found that the stock market had a mixed impact on economic growth. Aboudou (2009) focused on the West African Monetary Union countries, finding that the capital markets determined economic growth in the region.

Regarding the strand of studies on the Ghanaian economy, Osei (2005) used quarterly data from 1991 to 2003 to show 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 in either the short-run or long-run. They also confirmed that although the domestic credit to the private sector enhanced sustainable growth in Ghana, the capital market did not. Studies by Asante et al. (2011), Acquah-Sam and Salami (2014), and Adusei (2014) also found that the capital market enhanced the development of the Ghanaian economy.

Having reviewed the empirical literature, it is obvious that while several studies such as those by Grilli and Milesi-Ferretti (1995), Levine (1997), Eichengreen and Leblang (2003), Bonfiglioli and Mendicino (2004), Vazakidis and Adamopoulos (2009), and Echekeba et al. (2013) focus 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 the financial market, it is accounted for in this study. Hence, we provide a more comprehensive assessment of the effect of the 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 such as treasury bills, which were often ignored in studies as in those by Bolbol et al. (2005), Azarmi et al. (2005), Shahbaz et al. (2008), Vazakidis and Adamopoulos (2009) and Enisan and Olufisayo (2009), despite their use by the government to cater for short-

term fiscal responsibilities in developing countries, our study is novel and contributes to the literature.

2. 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 the Ghanaian economy. Thus, following on from studies such as those by 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 includes short-term instruments such as monetary policy rate, treasury bill rate, total liquidity, as well as long-term instruments such as 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 by means of real GDP per capita. Thus, the model becomes:

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

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

Where Δ is the first difference operator; $\Pi', \hat{\omega}_{1,3}$ 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 subsequently considered in simpler variants in section 4 of this study.

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 bill 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 the private sector as a ratio of GDP ($DCPS$), market capitalisation 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, \mathbf{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 bounds testing approach developed by Pesaran and Shin (1998), based on the unrestricted error correction technique, is employed in this study since it covers a period of 25 years, and is expressed as follows:

The first process is to estimate the ARDL model using the ordinary least squares in order to find whether a long-run relationship among the variables exists (Owusu and Odhiambo 2014a; Mesagan et al., 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 there being no long-run relationship among the variables in the equation. The following null and alternative hypotheses tested are: $H_0 : \Pi' = 0$,

$\alpha_1 = 0, \alpha_2 = 0, \alpha_3 = 0$ [i.e. no cointegration or the non-existence of a long-run relationship] against $H_1: \Pi' \neq 0, \alpha_1 \neq 0, \alpha_2 \neq 0, \alpha_3 \neq 0$ [i.e. cointegration or the existence of a 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-statistic is greater than the upper critical value and accepted if otherwise. It is, however, inconclusive if the computed F-statistic lies between the two critical bounds. Afterwards, the second process is to estimate the long-run parameter estimates with their optimum order selected by Akaike Information Criterion (AIC) or Schwarz Bayesian Criterion (SBC) after establishing that co-integration exists among the variables of interest.

According to Pesaran et al. (2001), the estimator has the following inherent advantages over other estimation approaches. The method is relatively simple and also employs the Ordinary Least Squares (OLS) technique to test the long-run relationship. Irrespective of whether the unit root tests of the datasets are at level or first difference or a combination of both, the existences of the co-integration can be tested. Also, it is more efficient for studies with small samples because of its inherent strength to accommodate few observations without being biased. For example, the ARDL estimator was employed by Pattichis (1999), Tang (2001, 2002), and Tang and Nair (2002) to model a disaggregated import demand, inflation, money demand and import demand using annual data sets spanning from 1975-1994, 1973-1997, 1973-1998, and 1970-1998 respectively (Narayan and Smyth, 2005). Lastly, it is applicable where the regressors are endogenous.

The study employs annual time series data spanning from 1991 to 2017, which captures the periods of financial liberalisa-

tion in Ghana. The data is sourced from the Bank of Ghana statistical bulletin (BOG, 2019) and World Development Indicators (WDI, 2019). Regarding *a priori* expectation for short-term instruments such as 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 bill 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 an 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 impact 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.

3. Empirical results

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 a 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. With respect to the long-term financial market indicators,

the average value of domestic credit to the private sector, market capitalisation, total value of stock traded, and stock market turnover is 11.71%, 10.72%, 0.42% and

5.43% correspondingly. This means that, on average, long-term financial market instruments are lower than short-term ones.

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 bill 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 capitalisation (% 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 capitalisation; STG – stock traded value; SMT – stock market turnover; CAP – capital; and FDI – foreign direct investment.

Source: Own elaboration.

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 a 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 capitalisation; STG – stock traded value; SMT – stock market turnover; CAP – capital; and FDI – foreign direct investment.

Source: Own elaboration.

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 level but are all stationary at first difference. However, total liquidity, total value of traded stock and

capital investment are stationary at levels. Since the unit root test result indicates that the variables are both I(0) and I(1), it means

that the ARDL bounds test is the most appropriate for the 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 the significance level at 1%, 5% and 10% respectively. PCI – per capita income; TBR – treasury bill rate; MPR – monetary policy rate; TL – total liquidity; DCPS – domestic credit to private sector; MC – market capitalisation; STG – stock traded value; SMT – stock market turnover; CAP – capital; and FDI – foreign

direct investment.

Source: Own elaboration.

In Table 4, we select the orders of the ARDL models using the Akaike Info Criterion (AIC). The table shows that the calcu-

lated F-statistics are greater than the upper bound critical values indicating that the null hypotheses of no cointegration are rejected at the 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)	$F_{PCI}(PCI MPR, CAP, FDI)$				5.5911***	
Model 2 ARDL (1,1,2,2)	$F_{PCI}(PCI TBR, CAP, FDI)$				5.8543***	
Model 3 ARDL (2,0,0,2)	$F_{PCI}(PCI TL, CAP, FDI)$				4.5854**	
Model 4 ARDL (1,2,2,1,2,2)	$F_{PCI}(PCI MPR, TBR, TL, CAP, FDI)$				4.6007**	
Model 5 ARDL (1,2,1,1)	$F_{PCI}(PCI DCPS, CAP, FDI)$				5.0010**	
Model 6 ARDL (1,2,2,2)	$F_{PCI}(PCI MC, CAP, FDI)$				4.5436**	
Model 7 ARDL (2,1,1,2)	$F_{PCI}(PCI STG, CAP, FDI)$				4.5259**	
Model 8 ARDL (1,1,2,2)	$F_{PCI}(PCI SMT, CAP, FDI)$				4.7120**	
Model 9 ARDL (2,2,2,1,2,2)	$F_{PCI}(PCI MC, STG, SMT, CAP, FDI)$				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 Model 4	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 the null hypothesis at 1%, 5% and 10% significance levels respectively.

Source: Own elaboration.

4. Analysis 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 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.

This therefore 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 on 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 by means of monetary policy rate, treasury bill rate, and 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 an 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 such as 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 frees up funds and makes them available for investment, thereby enhancing the growth rate of the Ghanaian economy. In 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 bill rate to move their investment portfolio 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 shortfall in investment is eroded as domestic firms can then obtain their foreign inputs cheaply, meaning that 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 to the Ghanaian economy in the long run.

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

Models	Dependent Variable: Real income per capita								
	1	2	3	4	5	6	7	8	9
	(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 the null hypothesis at 1%, 5% and 10% significance levels respectively. PCI – per capita 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 capitalisation (% of GDP); STG – stock traded value (% of GDP); SMT – stock market turnover; CAP – capital (% of GDP); and FDI – foreign direct investment (% of GDP).

Source: Own elaboration.

The short-run results of short-term financial instruments such as monetary policy rate and treasury bill rate, which adversely affect the Ghanaian economy, can be traced to the rigid refusal 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 calls for a reduction over the previous five years. This study confirms that such rigidity in the bank rate has a short-term debilitating impact on the country's economy. The findings of the short-term indicators are in sync with those of Agyapong and Adam (2011), Quaidoo (2011), Dziwornu and Awunyo-Vi-

tor (2013), and Acquah-Sam and Salami (2014), while the result of the long-term financial indicators concurs 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 converges to the current year's long-run equilibrium. This thereby supports the existence of the 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 (0.946)	0.100 (0.906)	0.688 (0.520)	3.173 (0.129)	0.421 (0.671)	0.253 (0.782)	1.175 (0.340)	0.017 (0.984)	2.395 (0.186)
Functional form	1.312 (0.209)	1.972 (0.072)	1.845 (0.086)	1.226 (0.266)	1.023 (0.301)	0.814 (0.433)	1.897 (0.079)	1.439 (0.172)	2.129 (0.247)
Normality	1.191 (0.551)	0.631 (0.729)	1.046 (0.593)	1.065 (0.587)	1.466 (0.481)	1.199 (0.349)	0.800 (0.670)	0.626 (0.731)	3.463 (0.177)
Heteroskedasticity	1.078 (0.298)	1.724 (0.180)	1.177 (0.258)	2.028 (0.175)	0.288 (0.922)	1.328 (0.317)	1.087 (0.294)	1.373 (0.289)	0.735 (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 the null hypothesis at 5% and 10% significance levels respectively.

Source: Own elaboration.

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 of squares fall within the critical bounds at the 5% significance level, indicating that the parameters are stable over the sample periods.

Conclusions

This paper empirically investigates the impacts of both short-term and long-term financial market instruments on economic growth in Ghana within the period of 1991 to 2017. Although several studies have investigated the nexus between financial market development and economic growth, the scarcity of studies examining the effects of both short-term and long-term financial instruments necessitates this study based 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 - the 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 positively 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 the liquidity ratio. We therefore conclude that long-term financial instruments performed better than 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, policymakers should ensure the 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 an 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 bill rate and make more funds available to the private sector, since the general bank lending rate will fall further than its current level. 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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