

FINANCIAL MARKET INSTRUMENTS AND ECONOMIC GROWTH IN GHANA

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Abstract

This study interrogates the relationship between financial market instruments and economic growth for Ghana, relying on time series economic dataset spanning from 1980 to 2020, and using economic and financial data gleaned from World development indicators of the World Bank and from the Central Bank of Ghana. Econometrically, Augmented Dicky-Fuller (ADF), Johansen cointegration test and error correction model (ECM) was used for the analysis. Study findings show that, there is statistically significant association between financial market instrument and economic growth in Ghana. Further, the relationship between financial market instruments and growth of Ghana's financial sector is insignificant. We recommend amongst others, the necessity for state actors to create enabling environment for macroeconomic fundamentals to strive, consolidate gains and continue reforms geared towards deepening the financial space to enhance domestic economic activities, investment, and long-term economic health of the nation.

Keywords: *financial Market, ECM, Economic Growth, Instruments, Treasury Bills, FDI, Policy Rate.*

Résumé

Cette étude interroge la relation entre les instruments du marché financier et la croissance économique au Ghana, en s'appuyant sur un ensemble de données économiques chronologiques couvrant la période 1980-2020, et en utilisant des données économiques et financières tirées des indicateurs de développement mondial de la Banque mondiale et de la Banque centrale du Ghana. Sur le plan économétrique, le test de cointégration de Dicky-Fuller augmenté (ADF), le test de Johansen et le modèle de correction d'erreurs (ECM) ont été utilisés pour l'analyse. Les résultats de l'étude montrent qu'il existe une association statistiquement significative entre les instruments du marché financier et la croissance économique au Ghana. En outre, la relation entre les instruments du marché financier et la croissance du secteur financier du Ghana est insignifiante. Nous recommandons, entre autres, la

nécessité pour les acteurs étatiques de créer un environnement propice aux fondamentaux macroéconomiques pour s'efforcer de consolider les acquis et de poursuivre les réformes visant à approfondir l'espace financier afin d'améliorer les activités économiques nationales, les investissements et la santé économique à long terme de la nation.

Mots-clés : marché financier, ECM, croissance économique, instruments, bons du Trésor, IDE, taux directeur.

Introduction

The financial market is an important and integral part of the Ghana's economy, playing a fundamental role in ensuring economic growth process of the country (Asante, Agyapong & Anokye, 2011). Specifically, it moderates a key function in banks liquidity management and monetary policy transmission mechanism (Kovanen, 2011; Akosah, Alagidede, & Schaling, 2020). There are two important legs in the financial marketplace. The money market's function in banks' liquidity management and intermediation process by providing suitable financial instruments for liquidity trading. The market further allows the refinancing of short to medium term facilities, to moderate and mitigate business liquidity shortfalls and exposures, determines liquidity supply and inflation associated with demand-pull, and interest rate determination (Obeng and Sakyi, 2017). Notably, money markets tend to be among the most liquid in the financial sector in an economy. Because of its liquid position, the money market helps in the refinancing of short to medium term liquidity needs and alleviates business' liquidity exposures.

In the financial space, the money market and banking sector represents the sole settings for monetary policy transmission mechanism. Undisputedly, a well-functioning, effective and efficient interbank operations, moderate the effectiveness of the central bank's policies, spreading its tentacles and impulses into the economy. Therefore, the effective expansion of the money

market deepens the progress of intermediation in the financial sector and boosts economy wide lending to both the private and public sector, thus improving economic expansion and social well-being of the citizens. (Alakbarov and Murshudova, 2020; Purewal and Haini, 2021). Thus, money market growth and all its associated interest groups, the banking community, and the central Bank as well as the economy, benefits. One of the functions of the money market is to facilitate trading in the short-term debt instruments to bridge demand for large users of loanable funds such as public, private, banks and other institutions ((Ehigiamusoe, 2013). Additionally, money market deepening serves as an indicator for accessing the level of the economy's state of development. The second important category of the financial market is the capital market.

The capital market deals in longer dated instruments and serves as the link between those who sort for long term debt instruments and those willing to offer investible instruments on the market. Capital markets, normally referred to as the stock markets, from a wider perspective, it is considered as a market of longer dated financial securities or assets, the market essentially plays a very significant role in mobilizing resources and allocating them to productive sectors of the economy, and an important determinant in the process of economic expansion if a country is facilitated by the Capital Markets. Importantly, the markets facilitate economic growth through the proper allocation of resources from the sectors who have excess capital to the sectors with capital demand(Pazarbasioglu-Dutz et al., 2017). Therefore, we can suggest that it facilitates in industrial expansion and trade of both public and private channels, leading to a balanced economic growth in the country. Aside liquidity mobilization, the Capital Markets assists in the stabilization of prices of stocks, reduction in the speculative activities and channels capital to borrowers at a lower interest rate. On the

market platform, the following instruments are traded, Debentures, Shares, Government securities and Bonds. Because of high volatility in the capital market, the need for long term investment commitment is paramount (Kusmayadi, Firmansyah, & Rustendi, 2020). The money market takes care of short-term funds requirements (three-month Treasury bills, six-month certificates of deposit, and commercial paper), and the capital market is designed for long-terms loanable funding needs (Langenbucher, 2019). Here, the distinguishing factor between the money and capital market is the degree of liquidity of assets or instruments bought and sold in each of the markets.

In developing and emerging economies including Ghana, the financial markets are still not fully developed. As such, lack of fully and well-functioning money and capital markets in these economies have deleterious effect on pooling funds sufficient for both the public and private sector players. Though Ghana's financial market has witnessed some healthy reforms and growth, nonetheless, some challenges persist in the sector. The Ghanaian money and capital markets are less robust when compared to similar markets in the advanced economies like that of the United States of America, the market is riddled with issues of poor coordination in debt instrument issuance (Mensah, 2017; Obi, 2021), less diversified financial instruments and inadequate information flow among others. Can we suggest therefore that less robustness of both the money and capital markets operations hinder economic growth in Ghana? To answer this question which has not been fully dealt with by previous research in various ways, we attempt to re-examine the linkage between financial market instrument and economic growth in Ghana, relying on time series data with different time span.

1.2 Reason for the Study

An important trait of the financial market requires that it should be deep and broad to make it absorbable for large volumes of transactions to avoid swings on security prices and interest. It is also significant to have an active and vibrant money and capital market participants such that the transactions of a single investor will have insignificant effect on security prices and interest rates determination. Furthermore, characteristics of the market necessitates that there should be various investible securities to ensure continuous alternative investment channels available to satiate respective and prospective return-risk requirements of investors on the market platform. An economy with efficient, effective, deep and broad financial market, will be informational and will by no means significantly moderate the growth of the economy.

Caporale, Howells, & Soliman, (2004) argue that capital market development leads to economic growth through capital accumulation and efficient resource allocation, Ikpefan & Osabuohien, (2012), contends that the money market is an anchor for liquidity creation in an economy for the public, private institutions and individuals whilst the study done by Arestis & Demetriades (1997) on financial market development and economic growth did not yield any conclusive results. However, in Ghana, the financial market is fledgling and constrained by the lack of sub-markets and limited credit instruments needed for the smooth operations of the sector. Even though Ghana have undertaken financial sector reforms from the 1980s, the market is improving regularly but remains less robust. This is shown in the lack of anticipated results from the many programmes establish by the successive governments to achieve their set goals, because of poor local participation by the states' established economic programmes, with the hope to foster economic and financial development, such as Structural Adjustment Programme (SAP) 1983, financial sector adjust-

ment programme (FINSAP) 1987, Banking sector consolidation (BSC) 2018, Millennium Development Goals (MDGs), Rural and Agricultural Finance Programme, Northern Rural Growth Programme, Rural Enterprises Project - Phase II. Northern Region Poverty Reduction Programme, Rural Financial Services Project among other developmental plans. The uncertainty that the financial market instrument has significant bearing in the market space, makes this study relevant.

Our main objective of this research is to examine the workings and activities of Ghanaian financial market space. And the specific objectives of the study are stated below:

- 1) To assess the linkage between financial market instruments and Ghanaian economic growth.
- 2) To establish the effect of money and capital market instruments on financial development in Ghana.

2. Literature Review

2.1 Conceptual Framework

The financial market is a broad term that refers to financial services sector comprised of stock market, bonds market, derivatives market, foreign exchange market, over the counter market (OTC) and other markets (money market, commodities market reinsurance, insurance, and real estate market). In these markets, financial instruments or assets are traded with the view to keep the “oil” of the economy going (Fonkam, Akume, & Sama, 2019). In these subsectors, prices of securities, rates and interest are largely influenced and watched by the Bank of Ghana’s monetary policy directions, anchored on government of Ghana’s annual monetary policy goals. Instruments are of high quality, both unsecured and secured as well as exhibit both relatively high and low risks financial assets such as: shares, dividends, interest payments, premiums, savings of various forms, negotiable and non-negotiable certificate of deposits,

bankers' acceptances, commercial papers, call money, treasury bills and treasury certificate among others.

Efficient and well-functioning financial markets exist in the global south (developed countries), particularly in the highly advanced economies with high income per capita, while those in the lower to middle income economies reflects the state of their economic conditions. In the latter, the markets are shallow, fledgling, less integrated and in some cases, non-existent in the actual sense of a market (Alam & Hussein, 2019). In fact, the state of financial market development in a country, serves as an indicator for gauging out the level of economic development of the country. Indeed, the conventional wisdom assert that the level and speed of development of one, impact the spate of development of the other.

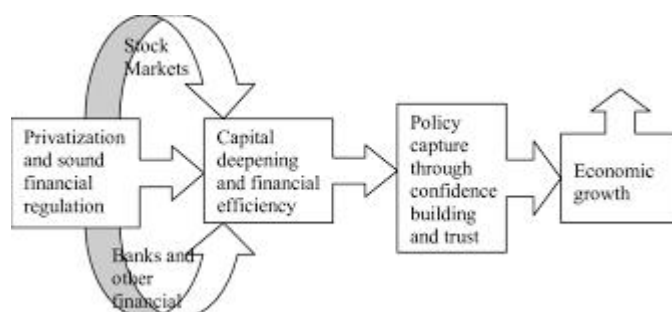


Figure 1: Adapted from-A. Gentzoglanis (2003)

As suggested by Senbet and Otchere (2006), the financial market play a moderating role in mobilizing both short and long-term financial resources for the private and public sector for both investment and consumption purposes through financial intermediation. The advancement of financial globalization hinges on efficient and effective financial markets

integration. Noting however, that a well-developed and deep local financial market has the propensity to better position a country's quest for global capital inflow. Additionally, through a well-organized and deep financial intermediation process, financial markets improve the quality of investment by channeling appropriate funds to the well-positioned and profitable investment projects, effectively impacting on the growth of the economy.

On the other hand, economic growth, as important as it is, is a concept used in gauging out or assessing the performance of an economy, anchored on macroeconomic fundamentals. As mostly used interchangeably with economic development in numerous studies, they differ fundamentally. Defined variously, economic growth is the increase per capita (Norman and Warren, 2020) or measuring economic growth in the process of the country's changing dynamics (Piętak, 2014). While Cvetanović, Mitrović, and Jurakić (2019), views economic growth as the country's changing production value capability over time. Thus, they are of the view that for the country to achieve such growth, depends on its ability to accumulate factors of production, absorptive capacity as well as acquisition of knowledge. However, they view in part, the most important and basic variables of growth to include among other things, population dynamics of the country, financial sector development, macroeconomic environment, per capita income, education, political and social environmental settings.

2.2 Theoretical Review

Theories concerning financial markets are varied deep and wide, explaining several factors that make the sector stick, drawing in the needed funds for economic augmentation and development of a country. Mainly, financial markets are the anchor upon which an economy stands and therefore, there is the need for a

better understanding of the sector and how to manage it. In modern growth theory, there are two important channels by which the financial sector could affect long-term economic augmentation of the country as espoused by Lucas (1988) and Romer (1986). They opined that growth will be achieved through capital accumulation and increasing technological progress. Indeed, a good conditioned financial market or sector hinges on five essential functions “mobilizing and pooling savings; producing information ex-ante about possible investments and allocating capital; monitoring investments and exerting corporate governance; facilitating the trading, diversification and management of risks; and facilitating the exchange of goods and services” (Obi, 2021 p153). However, out of these five factors, the financial sector’s ability to mobilize savings for investment purposes and allocating capital effectively and efficiently among competing interest are the anchor upon which economic growth rely.

Furthermore, McKinnon, (1973) and Goldsmith (1969) as later studies by Chakraborty (2020) underscore the fact that financial markets development, are very important players in economic growth and development, situates in the context of financial intermediation theory. Emphasizing that the differences in the level of economic growth across various countries are attributable to the depth and quality of services offered by financial institutions. And further alluding to the fact that the positive relationship between financial sector depth and real per capita growth is credited to the influencing role of financial sector depth has on supporting a better use of capital stock (Naceur, Blotevogel, Fischer, & Shi, 2017). Inversely, economic growth process also influences further deepening of the financial markets due in part to the creation of incentives for financial sector to develop even more. On the contrary, McKinnon (1973) espoused the complementarity hypothesis different from the theory of Neoclassicals monetary growth. He

suggested there exist a complementarity between money and physical capital, a situation necessitating the demand for money in the economy. McKinnon's theory links money demand and the ability for physical capital accumulation occasioned by reasons for the supply of money which is rooted in the decision to save and invest. Another hypothesis propounded to explain financial markets functions is that of Shaw (1973) debt intermediation, which expanded the understanding between savers and investors through financial liberalization for which increased savings stimulate investment prospects because of increase in credit supply and as well, creates incentive to save for higher returns (interest rates). This viewpoint underscores the significance of competition within and between the market players as precondition for the successful financial intermediation (Chukwuani & Osita, 2018).

Starting from the complementary hypothesis of both McKinnon and Shaw (1973) of financial markets fragility, they suggest that policies that serves as disincentive to the growth of financial markets, invariably affect savings because of its repressive nature. Additionally, low savings affect investment in the domestic front because of low financial capacity to lend. This hypothesis, therefore, has been the driving force for developing and less developed economies such as Africa among others, to embrace financial sector reforms to enhance financial sector performance. The reforms measure worked to advanced savings and investments dynamics in the aggregate level, however, it could not explain the fledging micro-level performance among the financial markets, institutions, and some economic agents. This behaviour subsequently has deleterious effect on demand and supply situation of credit and affects economic growth because of the lack of adequate savings and subsequent lending to deficit unit of the economy. This further led to the development of financial intermediation theory.

Indeed, among others Braun, Gabor, and Hübner, (2018), Benton and Philips (2020), Sorrentino (2020), and Schumpeter (1934) opined the relationship between financial sector performance and the real economy, and the influential role played by financial markets and institutions in supporting the expansion and development of the economy. Though economist such as Goldsmith (1969), Shaw(1973), McKinnon (1973) and Schumpeter (1934) could not advance the theoretical bases upon which financial markets and institutions affect the growth of the economy, certainly recent works by Barro and Sala-i-Martin (2004), have successfully developed economic models that speaks to the relationship between finance and growth. This study looks at the linkages on how financial intermediation and economic growth interacts and secondly, the inverse influence of growth on the development of the financial intermediation. The health of the economy is enhanced by financial intermediation through its efficient capital allocation functions (Levine 2004). Additionally, Bist (2018), Sepehrdoust and Ghorban-seresht (2019) and Čižo, Lavrinenko, and Ignatjeva (2020), agreed that the relationship between financial develop-ment and economic growth is positive and significant.

2.2 Empirical Review

Asante, Agyapong, and Anokye (2011) examine the linkage between bank competition, stock market on economic growth in Ghana from 1992 to 2009. Using statistical tools and sophisticated econometric tools of the autoregressive distributed Lag (ADRL), and dynamic ordinary least squares (DOLS), while employing Johansen Co-integration, and Granger causality tests in their analysis. Their findings showed that there is a positive and relevant short-run and long-run relationship between bank competition, stock market development and economic growth in Ghana. On the contrary, Adusei (2013) used three measure of

financial variables such as domestic credit as percentage of GDP, private sector credit to GDP and broad money supply as a share of GDP, while using fully modified ordinary Least Square (FMOLS), error correction model (ECM) and generalized method of moments (GMM) approach, they looked at the effect of economic growth financial development on an annualized time series data spanning from 1971 to 2010. Their findings suggest that economic growth weakens financial development in Ghana.

Using ADRL to bound testing econometric technique to estimate variables such as real GDP per capita, monetary policy rate, treasury bill rate, stocks traded, bank credits, stock turnover, market capitalization, FDI, and gross investment over a period of 1991 to 2017, Mesagan, Ogbuji, Alimi, and Odeleye (2019) examined financial market instruments and economic growth in Ghana, and contends that there are both short and long run association between financial market variables and economic growth and that in the long run, financial instruments perform better than in the short run. Further, Ogbuji, Mesagan, and Alimi (2020) investigates the dynamic relationship between money market, capital market and economic growth in Ghana from 1991 to 2017. Using ADRL framework, their findings confirm a long run association between money market, capital market and economic growth. This result indicates that both the money and capital markets can serve as a genuine stimulant in Ghana especially in this period of global economic turbulence due to COVID-19 pandemic that is hitting hard on the Ghanaian stock market. Similarly, Havi and Enu (2014) established the impact monetary policy and fiscal policy on the economy of Nigeria from 1980 to 2012. Ordinary least squares (OLS) was employed in the analysis. Their estimated result findings revealed that monetary policy has positive correlation with economic growth on one hand and further, fiscal policy is

positive and statistically significant with economic growth on the other. The findings further indicates that of the two policy variables, monetary policy is better at enhancing the Ghanaian economy.

Akosah, Alagidede, and Schaling (2021) investigated the dynamics of money market interest rates in the Ghanaian economy using monthly data from January 2001 to December 2017. In the study, they adopted econometric techniques such as Dickey-Fuller (ADF), Phillip-Perron (PP) and KPSS Unit root Tests, time-varying correlation test as well as the generalised forecast error variance decomposition (GFEVD) methods of (Diebold and Yilmaz, 2009) to achieve the study objectives. Results indicate that monetary policy rate has a weak influence on volatility undercurrent of money market rates in Ghana. They further suggest that both the monetary policy and treasury bills rates are the cause of turbulence, while interbank, lending and interest rates are the absorbers of those shocks in the money market. In the same vein, Abasimi, Li, Salim, and Vorlak, (2018) examines the link between Inflation, Money Growth, Exchange Rates, and Interest Rates in Ghana using autoregressive distributed Lag (ARDL) and error correction model (ECM) on data over the period 1990-2017. Findings from the study suggest that money supply does not affect inflation in both the short and long run. On the other hand, exchange rate and nominal interest rates were found to granger cause inflation in both the short and long run unidirectionally. Confirming the need for to institute derivatives conveyance to engender economic growth.

3.0 Methodology and Model specification

3.1 Method of the Study

In this part, we focus our attention on the theoretical framework of the study, where dataset is gleaned from model specification, variables description and analysis technique. We use secondary data for our analysis, spanning the period of (1980 to 2020) and gleaned from World development indicators of the World Bank and BoG statistical bulletin, vol XX, 2019. The econometric path is as follows: unit root test, cointegration and Error Correction Model (ECM) to achieve study objectives. Furthermore, the variables consisting of Real gross domestic product (rGDP), newly developed IMF financial deepening index (findx), treasury bills rate (TBR), policy rate(PRT), total liquidity (TOL), value of stock traded(STOVR) and market capitalization (MCAP), and foreign direct investment (FDI).

3.2 Model Specification

We rely on modern growth theory model framework espoused by (Lucas, 1988 and Romer, 1986). following the information gained from both theoretical and empirical literature, the research examines the association between financial market (money and capital) instruments and economic growth of Ghana. Two models are used for analytical estimation for this study. (1) model (I) shall be used to regress the relationship between financial market instruments and Ghana's economic growth. (2) model (II) shall be used to examine the association between financial market instruments and financial development in Ghana. As indicated earlier, estimation period shall be between 1980 and 2020. We present the model specifications are as indicated below:

MODEL (I)

$$rDGP = f(TBR, PRT, TOL, FDI, STOVR, MCAP) \dots (1)$$

Equation (1) is rewritten as,

$$rGDP = \alpha_0 + \alpha_1 TBR + \alpha_2 FDI + \alpha_3 PRT + \alpha_4 TOL + \alpha_5 STOVR + \alpha_6 MCAP + \mu_t \dots (2)$$

Where, rGDP = the real gross domestic product

TBR = Treasury bills rate

PRT = Policy rate

TOL = Total liquidity (broad money/GDP)

stovr = value of stock traded %

MCAP = Market capitalization/GDP

FDI = foreign direct investment as share of GDP

α_0 is the constant term

$\alpha_1 - \alpha_6$ = represents the coefficients of the variables

μ_t = error term

MODEL (II)

$$findx = f(TBR, PRT, TOL, FDI, STVOR, MCAP) \dots\dots\dots(3)$$

Equation (3) is further transformed in equation (4) below:

$$findx = \beta_0 + \beta_1 TBR + \beta_2 PRT + \beta_3 TOL + \beta_4 FDI + \beta_5 STOVR + \beta_6 MCAP + \mu_t \dots\dots (4)$$

Where $findx$ = the newly developed IMF financial deepening index. All other variables remain the same. However, all variables are log transformed to avoid spurious regression outcomes. β_0 is constant and $\beta_1 - \beta_5$ are the coefficients of the variables used, and μ_t is the error term.

4. Results and Discussion of findings

4.1 Test for Unit Roots

We conduct the unit root for the time series variables used in this study by employing Augmented Dickey-Fuller (ADF) approach to test whether there are unit roots in the data, meaning if the data are stationary at levels or at first difference. Test results are presented in Table 1 below:

Table 1: Unit Root Test Results for model I and II variables

Variable	At levels	First Difference	Order of
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s	Intercept & Trend	Intercept	Intercept & Trend	Intercept	Integratio n
rGDP	-2.6323	0.7557	-4.1421**	-4.2551***	I(1)
findex	-3.0866	-2.3541	-40502**	-7.3876***	I(1)
TBR	- 5.7618** *	-3.1435**	-----	-----	I(0)
PRT	-4.0106*	0.8818	- 12.8686** *	- 13.0868** *	I(1)
TOL	-2.2340	-1.3761	-6.9149***	-7.0031***	I(1)
FDI	-2.4676	-1.1626	-5.7749***	-5.8573***	I(1)
STOVR	- 4.2331** *	- 403551** *	-----	-----	I(0)
MCAP	- 5.8160** *	- 4.3099***	-----	-----	I(0)

Source: Author's calculations, employing E-VIEWS 10, *** $p=1\%$, ** $p=5\%$, * $p=10\%$

Considering the estimates in table 1, the test conducted indicate that real gross domestic product(rGDP), financial deepening index (findex), policy rate (PRT), total liquidity (broad money as a share of GDP (POL) and foreign direct investments (FDI) are integrated at order one I(1) whiles treasury bills rate (TBR), value of stock traded (STOVR) and total market capitalization (MCAP) are integrated at levels I(0). Thus, variables are integrated at different orders but for the purposes of satisfying cointegration criteria, we ensure that all variables are intergraded in the same order I(1) for estimation of the respective models. The analysis is informative of the possibility of the existence of long run relationship between the variables.

We proceed to test for cointegration to ascertain the existence of a long run relationship among the variables under consideration.

4.2 Johansen Cointegration Test

After testing for unit root for the variables, we proceed to conduct co-integration analysis to determine if there exist a long run association between variables, the dependent variable, and the independent variables. Results are presented in Table 2 below.

Table 2: Co-integration test for both model I and II

MODEL I				
Hypothesized no of CEs	Eigenvalue	Trace Statistics	Critical values	Probability*
None*	0.8274	252.5383	125.6154	0.0000
At most 1*	0.7566	185.7607	95.7536	0.0000
At most 2*	0.6748	132.0507	69.8188	0.0000
At most 3*	0.5948	89.3645	47.8561	0.0000
At most 4*	0.5043	55.0350	29.7970	0.0000
At most 5*	0.4004	28.3652	15.4947	0.0004
At most 6*	0.2093	8.9263	3.8414	0.0028
Unrestricted Cointegration Rank Test (Maximum Eigenvalue)				
None*	0.8274	66.776	46.2314	0.0001
At most 1*	0.7566	53.7100	40.0775	0.0008
At most 2*	0.6748	42.6861	33.8768	0.0035
At most 3*	0.5948	34.3294	27.5843	0.0058
At most 4*	0.5043	26.6698	21.1316	0.0075
At most 5*	0.4004	19.4388	14.2646	0.0069
At most 6*	0.2093	8.9263	3.8414	0.0028
FOR MODEL II				
None*	0.7843	238.1575	125.6154	0.0000

At most 1*	0.7371	179.8691	95.7536	0.0000
At most 2*	0.6917	129.0967	69.8188	0.0000
At most 3*	0.6011	84.3796	47.8561	0.0000
At most 4*	0.5180	49.4467	29.7970	0.0001
At most 5*	0.2664	21.7086	15.4947	0.0051
At most 6*	0.2300	9.9361	3.8414	0.0016
Unrestricted Cointegration Rank Test (Maximum Eigenvalue)				
None*	0.7843	58.2884	46.2314	0.0017
At most 1*	0.7371	50.7724	40.6775	0.0022
At most 2*	0.6917	44.7170	33.8768	0.0018
At most 3*	0.6011	34.9328	27.5843	0.0048
At most 4*	0.5180	27.7381	21.1316	0.0051
At most 5	0.2664	11.7724	14.2646	0.1195
At most 6*	0.2300	9.9361	3.8414	0.0016

*denotes rejection of the hypothesis at the 0.05 level

**Mackinnon-Haug-Michelis (1999) p-values

Our cointegration estimates in Table 2, indicate that trace-statistic value and Max-Eigen statistic are shown to be greater than the critical values at both 1% and 5% levels, therefore confirming the existence of mostly 7, except for model II (unrestricted cointegration rank test) which indicates 5 co-integrating equation at 5% level of relevance. Thus, we, reject the null hypothesis of no cointegration and accept the alternative which confirms the existence of long run equilibrium relationship between the dependent variables (rGDP and findx) and their respective independent variables treasury bills rate (TBR), policy rate (PRT), foreign direct investment (FDI), total liquidity (TOL), value of stock traded (STOVR) and total market capitalization (MCAP). In other words, the presence of a long run cointegrating equilibrium also signals the existence of

short-term oscillations. To correct for this, we apply error correction regression analysis (ECM).

4.3 Error Correction Model (ECM) Estimation

After ascertaining that the variables are cointegrated, we use the error correlation model to construct a dynamic relationship of the model. The reason for this, is to show the speed of adjustment from the short run state to its long-run stable state or from long run reversion to a steady state.

Table 3: Error Correction Model estimates

Model I: dependent variable (D(rGDP))				
variable	coefficient	Std. Error	t-statistics	Probability
C	0.016324	0.003202	5.09845	0.0000
D(TBR)	0.023120	0.014563	5.19872	0.0000
D(PRT)	0.057964	0.101156	6.01243	0.0000
D(TOL)	0.034205	0.059485	4.87450	0.0015
D(FDI)	0.007191	0.012070	3.85621	0.0018
D(STOVR)	0.001648	0.000809	2.03717	0.0294
D(MCAP)	0.010569	0.009178	4.01089	0.0012
ECM(-1)	-0.001068	0.105871	-3.70843	0.0004
<i>R-Square: 0.551040, Adjusted R-Square: 0.501280, F-statistics: 2.28645 Prob(f-stats): 0.02314, DW: 1.23301</i>				
Model II: dependent variable D(findx)				
C	0.001378	0.001933	0.712566	0.4814
D(TBR)	0.004625	0.011887	0.389067	0.6999
D(PRT)(-1)	-0.054701	0.061050	-0.896004	0.3772
D(TOL)	0.031568	0.034238	0.919088	0.3651
D(FDI)(-1)	0.002389	0.007132	0.335009	0.7399
D(STOVR)	0.000617	0.000487	1.268326	0.2141
D(MCAP)	0.002292	0.005708	0.401524	0.6908

ECM(-1)	-0.012590	0.006622	-1.901403	0.0666
<i>R-Square: 0.309334, Adjusted R-Square: 0.153377, F-statistics: 1.983456, Prob(f-stats): 0.089648, DW: 1.967304</i>				

We analyze the results obtained from our data using the following measures: statistical, econometric, and economic, implications of the estimated results.

4.3.1 Economic implication

For Model I:

All regressors indicate correct expected sign from the results of the analysis conducted as informed by relevant economic theory. From the equation for model I, Intercept of β_0 is positive, informing us that when the explained regressor variables in the model is zero, real gross domestic product (rGDP) is expected to be Ghc 1.6324 billion in the model. The indicated positive sign of the coefficient of treasury bills rate (TBR), policy rate (PRT), total liquidity (TOL), foreign direct investment (FDI), value of stock turnover (STOVR) and total market capitalization (MCAP) indicates the existence of a positive relationship between indicated variables and economic growth (real gross domestic product) in Ghana. The result meets theoretical expectation, showing that a one billion Ghana rise in TBR, PTR, TOL, FDI, STOVR and MCAP will result in an economic expansion by 2.3120, 5.7946, 3.4205, 0.7191, 0.1648 and 1.0569 billion Ghana cedis, ceteris paribus. As further expected, the result of the error correction model shows that the error correction term ECM (-1) is well specified and the diagnostic are good. The ECM (-1) variable has a negative sign and statistically significant. Indicating the speed of adjustment converges at -0.001068. About 0.1% of disequilibrium position

from long run of economic growth in the previous year is corrected in the current year in model.

For Model II

From the same table 3 above, the intercept β_0 is positive, showing that when the regressor variables as explained in the model II is zero, financial depth indicator (Findx) is predicted to be 0.14% in the model. Furthermore, the positive coefficient of treasury bills rate (TBR), total liquidity (TOL), foreign direct investment (FDI), value of stock turnover (STOVR) and total market capitalization (MCAP) indicates that there is a positive association between TBR, TOL, FDI, STOVR, MCAP and financial depth variables (findx) in Ghana. As expected in line with theoretical underpinnings, informing as that a one billion Ghana cedis rise in TBR, TOL, FDI, STOVR and MCAP will lead to an expansion in findx by about 0.46%, 3.157%, 0.239%, 0.006% and 0.229% respectively, ceteris paribus. In conclusion, the negative coefficient of error correction model ECM(-1) is statistically relevant at an adjustment speed of 1.25%. This implies that over 1.25% deviation in our regressor variable can be corrected in the first period.

4.3.2 Statistical implication of estimated results

Model I:

From the results in table 3 Model I, regressors (TBR, PRT, TOL, FDI, STOVR, and MCAP) are statistically relevant. This result means that, treasury bills rate (TBR), policy rate (PRT), total liquidity (TOL), foreign direct investment (FDI), value of stock turnover (STOVR) and total market capitalization (MCAP) are statistically relevant in causing short-run changes in economic growth in Ghana.

The R^2 which represent coefficient of determination is 0.551040 which implies that 55.1% of the difference in economic growth

is explained by the regressors or independent variables included in the model. While about 44.9% are accounted for by indicators exogenously. On the other hand, result of goodness of fit of the regression remained low after adjusting for the degree of freedom as indicated by the adjusted R-Square ($R^2=0.50128$ or 50.1%). The value of f -statistics is 2.2864 in the model, which measure the joint significance of the explanatory variables, and it is statistically significant at 5% having the corresponding probability value of 0.02314. This shows that the model is good and relevant.

For Model II:

Estimated results for model II in table 3, indicates that financial deepening variable (findx), treasury bills rate (TBR), policy rate (PRT), total liquidity (TOL), foreign direct investment (FDI), total value of stock turnover (STOVR) and total market capitalization (MCAP) are statistically irrelevant, indicated by their respective p-value of 0.6999, 0.3772, 0.3651, 0.7399, 0.2141 and 0.6908 respectively which are all greater than the t-statistics at 5% (0.05) level of significance.

Additionally, the coefficient of determination (R^2) for model II reveals that 30.9% variation in financial deepening were explained by the model, while the remaining 69.1% variation in financial deepening index could be because of other indicators not included in the model. Further, the coefficient of the adjusted R^2 is low at 15.3% after adjusting for degree of freedom. The joint significance measure, which is the F-statistics is 1.983456, indicating the power of explanatory variables, is statistically significant at 10 percent level as indicated by the corresponding probability value (0.089648). This indicates that the model is equally a good fit and significant.

4.3.3 Econometric implication for the estimated results

For both model I and II, The Durbin-Watson statistics is used to test for the absence of autocorrelation in the model. Here, the DW statistic shows that our error correction model is free from the problem of serial correlation at 1 % level of relevance due to its value (1.23301 and 1.967304). from these estimated values, our models can be used or relied upon for making inferences and offering policy recommendations.

5. Concluding Remarks and Recommendations

In this study, we set out to examine empirically the association between financial market instruments and economic growth in Ghana. Using money market variables as our explanatory and real gross domestic product as our proxy for economic growth, as well as the newly developed IMF financial deepening index dependent variables in our constructed model. Our explanatory variables includes treasury bills rates, policy rate, total liquidity, foreign direct investment, value of stock turnover and total market capitalization. Further, we use error correction model (ECM) to interrogate the impact of independent variables on the dependent variables under consideration. Leveraging on time series data covering the period from 1980-2020 and gleaned from the World development indicators and the Central Bank of Ghana annual statistical data Bulletins.

From our analysis, we uncovered that at present, Ghana's financial market plays influential role in the country's economic augmentation. Additionally, we observe an irrelevant or insignificant association between financial market instruments and the growth of Ghana's financial sector. This is an indication that Ghana' financial market is not well developed enough to produce the needed growth to push the economy. The relationship between the financial market and the real sector of the economy, however, continues on a positive and high level,

thus propelling the needed expansion in the economy. By this, we believe the government should intervene by creating the needed macroeconomic framework and maintain the current ongoing reforms with a desire of developing appropriate market structures that will promote productive domestic activities, investments, and eventually economic growth. Additionally, the state actors should in the short to long-run prioritize policies and programs geared towards stabilizing the financial market to anchor the economy on a sound footing.

With the inception of COVID-19 and its associated economic and financial fragility on economies, necessitating the rising cost of funds in the Ghanaian financial market, there should be the need for downward review of the cost to enhance competitiveness and improve attractiveness, since the financial market is a major source of raising funds for economic activities. Further, due to stability of the present political space, all tiers of state should be inspired to fund their developmental programmes through the Ghanaian financial market. This undoubtedly will make room for budgetary allocation to be channeled to other sectors of the economy.

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