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Article

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FINANCIAL ECONOMICS | RESEARCH ARTICLE

Macroeconomic determinants of mutual funds performance in Ghana

Adjei Gyamfi Gyimah^{1*}, Bismark Addai² and George Kwasi Asamoah³

Abstract: This study examines the impact of key macroeconomic variables on mutual funds' financial performance in Ghana. We employ the Pooled Mean Group (PMG) estimation of the Autoregressive Distributed Lag (ARDL) model to analyze the macroeconomic determinants of mutual funds in Ghana for the period 2007–2016. The study documents homogenous long-run significant positive impacts of exchange rate, inflation, T-Bill, GDP growth on mutual funds' financial performance, and a homogeneous long-run negative significant impact of monetary policy rate on the financial performance of mutual funds. The study also establishes heterogeneous short-run respective significant negative and positive impacts of T-Bill and monetary policy on mutual fund's financial performance. Unlike many previous studies that used stock data to estimate mutual funds' performance, accounting data is used in this study. Second, we incorporate monetary policy rate in our study variables since most of the prior studies ignored that variable. Finally, the outcome of our study contributes to existing knowledge on the short-run and long-run effects of macroeconomic variables on the financial performance of mutual funds from the perspectives of a developing country.

Subjects: Macroeconomics; Econometrics; Investment & Securities

Keywords: Macroeconomic; mutual fund; financial performance; Autoregressive Distributed Lag (ARDL); Pooled Mean Group (PMG)

Subjects: G1; G2; E44

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PUBLIC INTEREST STATEMENT

In this study, we employ accounting data of some selected mutual funds in Ghana to determine the macroeconomic determinants of mutual funds performance in the country for the period 2006–2017. Our results show a homogenous long-run significant positive impacts of exchange rate, inflation, T-Bill, GDP growth on mutual funds' financial performance, and a homogeneous long-run negative significant impact of monetary policy rate on the financial performance of mutual funds. We also find heterogeneous short-run respective significant negative and positive impacts of T-Bill and monetary policy on mutual funds' financial performance. Based on the findings, we have provided recommendations in this study to help boost mutual funds' performance in the country.

1. Introduction

Since the 1980s, the effect of macro-economic variables on the performance of mutual funds has been an area that has aroused the interests of academicians, investors, and regulatory bodies. The effectiveness of mutual funds would depend on the stability of macroeconomic variables prevailing in a particular economy. Ramey and Ramey (1995) posited that uncertainty and macroeconomic variables have significant negative relationship with private investment. Financial theory has recently focused on systematic risk emanating from inflation, exchange rate, and other macro-economic variables and how they influence financial performance. In view of this, numerous research have been done on the impact of macro-economic variables on the various stock markets in the world (Belgacem & Hellara, 2011; Pal & Mittal, 2011).

Mutual funds captured the public eye in the 1980s and 1990s when investors saw incredible returns (McWhinney, 2018). One of the most interesting financial phenomena of the 1990s was the explosive growth of mutual funds. This was particularly true in the United States where total net assets of mutual funds grew from USD 1.6 trillion in 1992 to USD 5.5 trillion in 1998, equivalent to an average annual rate of growth of 22.4%. With the exception of some East Asian countries (including Japan), it was also true of most other countries around the world. Among EU member countries, Greece recorded the highest growth rate at 78%, followed by Italy at 48% and Belgium, Denmark, Finland and Ireland, all with growth rates of around 35%. Some developing countries like Morocco registered even higher growth rates, but from much smaller starting points (Fernando et al., 2003).

In recent years, countries in the developing world, including those in Africa, have turned attention to the promotion of capital (financial securities) markets in the spirit of robust domestic resource mobilization; provision of long- and short-term capital; and the efficient allocation of existing resources. Given the fast-paced evolution of the financial world in relation to market development with mutual fund development as a subset, it is imperative to find out what factors influence the performance of mutual funds.

Databank Asset Management services is the earliest institution to officially establish the first mutual fund in Ghana, Epack Investment Fund Limited on 19 October 1996. There has been a significant growth of mutual funds in Ghana since 1996. The Securities and Exchange Commission Ghana (SEC Ghana) was created by the Securities Industry Law, 1993 (PNDCL 333) as amended with the Securities Industry Act, 2016 (Act 929) with its vision to monitor and ensure growth while promoting an efficient, transparent and fair financial market so that they can protect investors and maintain integrity. They protect investors by formulating rules for the regulation of the industry. Most investment companies provide asset management, investment banking, corporate finance, and private equity services. In Ghana, almost all the investment companies are licensed as pension fund managers by the National Pension Regulatory Authority (NPRA).

Of particular interest to this enquiry is how macroeconomic variables influence the performance of mutual funds. Kotishwar (2017) considered the repo rate, reverse repo rate, GDP, and inflation to assess the influence of economic variables on mutual funds' subscription and redemption amount in India. Kariuki (2014) assessed money supply, interest rate, inflation rate, GDP and exchange rate as possible influencers of the performance of mutual funds in Kenya. Gusni and Hamdani (2018) considered both macro and micro variables in analyzing factors affecting Indonesia's equity mutual fund performance. Lobao and Levi (2016) used GDP growth, industrial production growth, consumption growth, and unemployment rate growth as macroeconomic variables in assessing the relation between mutual fund flows, stock returns and macroeconomic variables in Portugal.

Globally, the dissemination of news or events on financial asset (like equity shares, bonds and mutual funds) prices has attracted the attention of financial economists for decades. Many studies

examined the effects of various pieces of information (e.g., earnings announcement, macroeconomic news, political news etc.) on financial asset prices. The general conclusion from these studies is that financial asset prices are affected by new information regarding firms' expected future cash flows and/or future discount rates (Gupta & Sinha, 2016).

Gusni and Hamdani (2018) evaluated equity mutual fund performance and identified factors that affect mutual fund performance with 19 equity mutual funds from 2011 to 2015 in Indonesia. The study used risk-adjusted performance and examined factors affecting mutual fund performance by using the investment manager's ability (market timing and stock selection skill), fund size, and inflation. Several inquiries, including Pal and Mittal (2011) and Singh et al. (2011), have evaluated the impact of macroeconomic variables on stock returns. By distinction, the present study evaluates mutual funds, most of which have a portfolio mix of debt and equity instruments. Furthermore, Gusni and Hamdani (2018) used 5-year data while the present study spans 10 years.

It is important to note that most of the similar inquiries on the topic have employed stock market data which essentially represents listed stocks on the stock market and where mutual funds are used; these are also usually listed (Adjasi et al., 2011; Asaolou & Ogunmuyiwa, 2011; Gusni & Hamdani, 2018; Olweny & Omondi, 2011; Pal & Mittal, 2011; Singh et al., 2011). Uniquely, the selected mutual funds for the present study are largely unlisted, and therefore, we employ mainly accounting data in computing performance.

The monetary policy rate as an explanatory variable is missing in most similar studies (Gusni & Hamdani, 2018; Kariuki, 2014; Kyereboah-Coleman & Agyire-Tetteh, 2008; Lobao & Levi, 2016; Tulamy, 2013). However, it is worth noting that the effect of general interest rates may be significantly different from the impact of the monetary policy rate as an anchor rate. This study therefore incorporates the monetary policy rate as an independent variable. Additionally, to the best of the authors' knowledge, Marfo (2016) remains the only study which focuses geographically on Ghana in assessing the impact of macroeconomic variables specifically on mutual fund performance as opposed to the performance of banks and other financial services. However, that study was only limited to a single mutual fund and was also limited to four-year annual data. While Marfo (2016) dwelt on one mutual fund in the study, this study seeks to broaden the evaluation by using seven (7) mutual funds. In terms of time period of data, while Marfo (2016) uses a 4-year data (2012–2015), this study employs 10-year quarterly data (2007–2016) to enhance the evaluation. Furthermore, most studies (Gusni & Hamdani, 2018; Kariuki, 2014; Lobao & Levi, 2016) have evaluated the impact of macroeconomic variables on mutual funds' performance without showing a distinction in impact between the short-run and long-run periods. This study comprehensively evaluates the effect in the short-run and the long-run.

To sum up, this study contributes to existing literature in the following ways: First, unlike many previous studies that mainly used stock data to analyze the performance of mutual funds, the selected mutual funds for the present study are largely unlisted and therefore we employ mainly accounting data in computing financial performance. Second, we incorporate monetary policy in our study variables since most of the prior studies ignored that variable. Finally, the outcome of our study contributes to existing knowledge on the short-run and long-run effects of macroeconomic variables on the financial performance of mutual funds from the perspectives of a developing country. We do this by using a 10-year quarterly data of seven mutual funds in Ghana to examine the short-run and long-run dynamics of the effects of macroeconomic variables on the financial performance of mutual funds; while employing the ARDL model as our main empirical model and the Modern Portfolio and the Arbitrage Pricing theories as our theoretical models. The next section is devoted to the theoretical and empirical review of relevant literature. Section three is dedicated to the research methodology, section four contains the statistical analysis and discussion of the results while section five concludes the study.

2. Literature review

The following are theoretical and empirical reviews pertaining to the effect of macroeconomic variables on mutual funds' performance.

2.1. Theoretical review

This paper adopts the Modern Portfolio and Arbitrage Pricing theories as the main theoretical underpinnings.

2.1.1. *The Modern Portfolio Theory (MPT)*

Harry Markowitz pioneered the Modern Portfolio Theory (MPT) in his paper "Portfolio Selection". Markowitz (1952) posited that if we treat single-period returns for various securities as random variables, we can assign them expected values, standard deviations, and correlations. Markowitz stated two significant thoughts regarding MPT. Firstly, he realized that mathematics could not pick out a single optimal portfolio but rather could only identify a set of efficient portfolios. Secondly, he recognized that the appropriate risk facing an investor was portfolio risk, which leads to a fundamental point that a stock's riskiness should not be measured just by the variance of the stock but also by their covariance.

Abidin et al. (2004) stated that MPT established by Markowitz (1952), provides the foundation of all the investment models we have today, including those in mutual fund studies. Markowitz provided an insight into the portfolio decision-making process of individual investors, showing that investors should select their portfolio based on the joint risk and reward characteristics of the portfolio, rather than selecting securities based on the individual characteristics of the assets. Mutual funds largely represent the case for diversification as posited by the MPT. Given that the present study focuses mainly on mutual funds' performance, the MPT serves a good underlying theory that informs why mutual funds exist primarily as an investment option and why mutual funds may outperform undiversified investment vehicles even during an economic downturn.

2.1.2. *The Arbitrage Pricing Theory (APT)*

The Arbitrage Pricing Theory (APT) was propounded by the economist, Stephen Ross in 1976. Ross suggested that a portfolio's expected returns are dependent on macroeconomic factors such as a separate source of systematic risk. The APT is a substitute for the Capital Asset Pricing Model (CAPM) in that both show a linear relationship between assets' expected returns and their covariance with other random variables. The covariance is interpreted as a measure of risk that investors cannot avoid by diversification.

Rasiah and Kim (2011) stated that Arbitrage Pricing Model (AP) is a famous model used to determine the factors such as market portfolio, which influences expected returns on individual asset prices in the financial markets. Many investors believe that the stochastic returns of capital assets are consistent with a factor structure. One of the benefits of the Arbitrage Pricing Model is taking the benefit of the mispriced securities as profit by arbitrageurs.

Ross' rationale behind this model is that two things influence the expected return on a financial asset: macroeconomic factors and the asset response to these influences. Brennan (1971) did the first empirical study on APT. He concluded that two risk factors must represent returns as opposed to CAPM as a single factor. (1975). The APT is based on the assumptions and insights developed in CAPM and Efficient Markets. The APT suggests that prices of risky assets abide by the law of no-arbitrage. The APT predicts that equity returns are influenced by a set of state variables, for example, GDP, inflation or interest rate. The risk premium of each asset is sensitive to the risk premium of risk factors (Bodie et al., 2009).

In the spirit of the APT, the financial performance of mutual funds can be explained by reference to the changes in the macroeconomic variables. The ARDL model used in this study provides us the avenue to determine how changes in the macroeconomic variables affect the financial performance of mutual funds indicated by the short-run coefficients of the model results and the coefficient of the error correction term in the model.

2.1.3. Accounting versus market-based performance evaluation

Firm performance has been recently proposed as a multi-dimensional construct that consists of many different aspects such as operational effectiveness, corporate reputation, and organizational survival (Richard et al., 2009). To assess the financial performance of firms, organizational researchers generally use either accounting-based measures or stock market-based measures (Gentry and Shen, 2010). Theoretically, researchers generally conceptualize accounting measures as reflections of past or short-term financial performance, and market measures as reflections of future or long-term financial performance (Gentry and Shen, 2010; Keats and Hitt, 1988). However, there is no consensus about the relationship between past/short-term performance and future/long-term performance.

The accounting-based metrics hold some advantages as follows. The market-based metrics are impacted by the level of market efficiency while accounting metrics are not. In the case of stocks, even if the assumption of full market efficiency holds, Bettis (1983) argues that a firm's stock price does not necessarily reflect its fundamental value because it is influenced by the information managers choose to disclose to investors.

Secondly, market-based measures involve a higher level of subjectivity largely because of the inclusion and quantifying of intangible variables, a phenomenon less pronounced in accounting metrics.

However, some demerits also emerge in the use of accounting metrics. Market-based metrics are argued to incorporate all relevant information, while accounting measures incorporate only aspects of firm performance. Accounting measures have also been known in some cases to be subject to managerial manipulation and distortions due to depreciation policies, inventory valuation, and treatment of certain revenue and expenditure items, differences in methods of consolidating accounts, and fraud (Gentry and Shen, 2010).

2.2. Empirical review

Several studies have been undertaken on the impact of macroeconomic variables on stock market returns, financial performance on mutual funds, insurance companies and non-bank financial institutions (e.g., Kariuki, 2014; Gusni & Hamdani, 2018; Panigrahi et al., 2020). Our empirical review is done under the macroeconomic determinants of mutual fund performance considered in this study, namely: exchange rate, inflation, treasury bill, GDP growth and monetary policy. The macroeconomic variables have been selected on the basis of data reliability, availability and consistency. Furthermore, the selected variables have been empirically and theoretically established to have very far-reaching impacts on other macro and micro variables (see Coffie, 2019; Onger, 2014; Panigrahi et al., 2020; Tulamy, 2013). Conspicuously, the monetary policy rate is seldom used in literature for similar enquiries.

2.2.1. Exchange rate

A higher exchange rate is seen as a disincentive to fund managers when they invest in foreign countries but is well appreciated when it falls. Exchange rate encourages local investors to invest in domestic economy when prices of foreign goods and services are rising due to the rise in exchange rate. When this happens, mutual fund performance will also rise. Panigrahi et al. (2020) use 5-year data on 4 selected mutual funds in India. The study establishes a positive effect of exchange rate on selected mutual funds' return by employing attribution. Coffie (2019) uses

short-run ARDL time series for a 10-year period, finding a positive effect of exchange rate on Ghana's mutual fund prices. Tulamy (2013) in his study which considered panel data of 11 mutual funds in Iran found a positive effect of exchange rate on fund return. Singh et al. (2011) found a negative relationship between exchange rate and stock returns of medium and large portfolios in Taiwan. Kyereboah-Coleman and Agyire-Tetteh (2008), on their part, discovered a significant positive relationship between exchange rate and stock market performance in Ghana. Kariuki (2014) revealed that exchange rate has a significant negative effect on mutual funds operating in Kenya with portfolios licensed by the Capital Market Authority.

2.2.2. Inflation

Generally, inflation has a converse relationship with interest-bearing assets and hence, interest-bearing mutual funds. This is fundamentally due to the eroding effect inflation has on value. However, equity diversified mutual funds have historically been immune to this eroding effect. From an investor or lender's perspective however, the eroding value can be passed on to borrowers, thereby increasing the returns on interest-bearing assets and hence, interest-bearing mutual funds. Panigrahi et al. (2020) concluded that even though risk increases with the increase in inflation rate, mutual fund performance tends to improve. Garg & Srivastava (2019) also conclude that inflation and assets under management (AUM) of mutual funds are positively correlated. Gusni and Hamdani (2018) found that inflation positively affects the equity mutual fund performance. Marfo (2016) established that though inflation has a positive influence on the performance of mutual funds in Ghana, in the long-run, it showed a negative impact in the short term. Tulamy (2013) also found a positive effect of inflation on fund return, while Singh et al. (2011) found a negative relationship for inflation with stock returns for portfolios of large and medium firms. Kyereboah-Coleman and Agyire-Tetteh (2008) discovered a negative effect of inflation on stock market performance while Kariuki (2014) found a significant positive relationship between inflation and financial performance of listed mutual funds in Kenya. Onger (2014) investigated the effect of macroeconomic variables on the performance of non-bank financial institutions in Kenya. The study revealed that a decrease in profitability was not due to poor management but due to inflation.

2.2.3. Treasury bill rate (T-bill)

Treasury bill rate is used in other studies as a proxy for interest rate as it forms the basis for pricing interest rate in some countries. Treasury bill is a short-term investment vehicle which ranges from 91 days to 365 days. Treasury bills have low default risk since they are backed by the credit of the Government. In order for mutual funds managers to diversify their portfolio, they do place part of their funds in treasury bills. Most investors are more likely to purchase treasury bills rather than purchasing mutual funds when treasury bill rates are higher and vice versa. Returns of equity-focused mutual funds are more likely to have an inverse relationship with the treasury bill rate, given that increasing treasury bill rate leads investors away from stocks to interest-bearing assets. Panigrahi et al. (2020) found a negative relationship between interest rate and equity mutual funds performance in India. Marfo (2016) also discovered that interest rate has a negative effect on the performance of Anidaso mutual fund, both in the long term and the short term in Ghana. Kariuki (2014) found that interest rates have a significant positive effect on all listed equity mutual funds in Kenya. Onger (2014) found a weak positive relationship between interest rates and return on assets for non-bank financial institutions in Kenya.

2.2.4. Gross Domestic Product (GDP) growth

GDP growth measures economic performance as well as the level of economic activity. Rising GDP growth indicates economic growth and fallen GDP growth could signify a national recession. Firms use GDP growth rate to predict whether their businesses will falter or will grow. A plummeting GDP growth rate has usually been a negative signal for investors to avoid investments such as mutual funds while a rising GDP growth rate achieves the opposite effect. GDP is directly linked with the

upsurge and down surge in financial markets. Investors invest according to the trend of the real GDP in the economy. However, Garg & Srivastava (2019) and Coffie (2019) found no relationship between GDP growth and the performance of mutual funds. Singh et al. (2011) found a positive relationship between GDP growth and stock returns for portfolios of big and medium firms. Kariuki (2014) found a significant positive relationship between GDP growth and equity mutual fund performance. Onger (2014) also established that GDP growth had a weak positive relationship with Return on Assets.

2.2.5. Monetary policy rate

Most central banks make monetary policy decisions to influence interest rate, influencing aggregate demand and the gap between actual output and its potential to influence inflation (Qureshi et al., 2019). Central banks use the policy rate to ensure price stability, ease inflationary pressures, and affect credit controls. The policy rate can affect interest rates (cost of funds), lending and borrowing patterns, and mutual fund performance. When the policy rate increases, it automatically causes interest rates to rise, and hence investors will demand a higher return on their investment. An increase in policy rate means the cost of borrowing will also increase as the interest rate rises, and individuals and businesses would have less money to invest. The rise in interest rates may make mutual funds and other investments less attractive in general. This means mutual funds will have insufficient capital to work with, making it difficult to generate healthy returns.

Qureshi et al. (2019) examined the relationship between bond fund flows, stock market returns, and financial policies in developed and developing economies. The findings suggest a bidirectional (negative) relationship between bond flows and market returns in the presence of fiscal and monetary policy for developed countries. However, in the case of developing countries, bond flows follow the previous performance of market returns. Moreover, an expansionary monetary stance has a negative impact on bond flows, while an expansionary fiscal policy exerts a positive influence on them. In addition, bond funds flourish in times of low economic activity in both developed and developing countries. Banegas et al. (2016) undertook an inquiry into the links between monetary policy and mutual fund flows and the potential risks to financial stability that might arise from such flows, using data over the 2000-2014 period. The study established that positive shocks to the path of monetary policy (unexpected tightening) are associated with persistent outflows from bond mutual funds. Conversely, a tighter-than-expected monetary policy path will cause net inflows into equity funds. Hojat (2015) also found that monetary policy is generally positively related to stock market returns.

3. Research methodology

The section broadly covers the data and variables used in the study and exposition on the empirical model and the estimation technique.

3.1. Data and study variables

Considering the difficulties and the inability to obtain accounting data from all the mutual fund institutions in Ghana, we sampled seven mutual funds that have been in existence for more than 10 years as at December 2016 and also shared distinguished features (See Table A1 in the appendix for the distinguished features of the mutual funds in our sample). That is, the seven oldest mutual funds in Ghana were selected for the study and the study uses quarterly data over a 10-year period from the first quarter of 2007 to the fourth quarter of 2016. The seven mutual funds included in this study are Epack Investment Fund, Anidaso Mutual Fund, Campus Mutual Fund, Databank Balanced Fund, Databank Money Market Fund, SAS Fortune Fund, and EDC Balanced Fund. The variables of interest in this study include return on investment of mutual funds (ROI) which is the proxy for the financial performance of mutual funds, inflation rate (INF), 91-day Treasury bill rate (T-BILL), exchange rate (ER) of the Ghanaian Cedi as against the United

States Dollar, growth rate of gross domestic product (GDP) and monetary policy rate (MPR). We also include firm size (SIZE) to fund differences that may exist. Again, due to incomplete and inconsistency of some firm-specific variables, those variables were excluded from the study. Return on investment was computed by dividing net income by total investment per mutual fund in a given year and scaling the results by 100. The data used to calculate the ROI and the size were sourced from the financial statements of the selected mutual funds while the macroeconomic data was sourced from the data repository of the Central Bank of Ghana.

3.2. The empirical model and estimation technique

We examine the macroeconomic determinants of mutual funds financial performance following the econometric approach adopted by Pattitoni et al. (2014) and Chowdhury and Rasid (2017) in similar studies on the determinants of the financial performance of financial institutions. The general simplified baseline model for macroeconomic determinants of mutual fund performance is specified as follows:

$$ROI_{it} = \beta_0 + \beta_1 ER_{it-1} + \beta_2 INF_{it} + \beta_3 T-BILL_{it} + \beta_4 GDP_{it} + \beta_5 MPR_{it} + \beta_6 SIZE_{it} + \varepsilon_{it} \quad (1)$$

In the above model, ROI is the return on investment which is the proxy for mutual fund financial performance. ER is the exchange rate of the Ghanaian Cedi (GHS) against the United State Dollar (USD), INF is the inflation rate, T-BILL is the 91-day treasury bill rate, GDP is percentage of gross domestic product employed as a proxy for economic growth, MPR is the monetary policy rate, SIZE is the firm size measured as the natural logarithm of total assets while ε_{it} is the error term.

3.3. Unit root test

Levin, Lin and Chin (LLC) test (Levin et al., 2002) and Im, Pesaran and Shin (IPS) test (Im et al., 2003) were used to check the stationarity of the variables. With the LLC test the heterogeneity of the cross-section units is checked though serial correlation and small sample size cause LLC test to have low power because serial correlation is not completely eliminated. It is against this weakness that this study also employed Im, Pesaran and Shin test because it fits well for small sample size and also completely wipe out serial correlation. The outcome of the panel unit root test (exhibited in Table 3 of section four of this study) justified the use of the Panel Autoregressive Distribute Lag (ARDL). According to Pesaran et al. (2001), the ARDL model is suitable when the study variables are integrated of orders $I(1)$ and $I(0)$. The panel unit root in this study shows that all the study variables are integrated of orders zero $I(0)$ and one $I(1)$ processes.

3.4. Autoregressive distributed lag (ARDL)

Autoregressive Distributed Lag (ARDL) bounds testing technique is adopted to analyze the short-run and long-run relationship between independent and dependent variables. Pesaran et al. (2001) propounded the ARDL estimation technique. Prior scholars used different general cointegration techniques in literature for varied situations. For example, Engle and Granger (1987) cointegration technique is the first general method applicable to variables in the same order of integration $I(1)$. Johansen and Juselius (1990) is the another common cointegration technique that is used for large sample size and the variables must have the same order of integration. The fundamental issue with the two general cointegration techniques is that all the variables must be in the same order of integration, else none of the two techniques will be applicable. Pesaran et al. (2001) advanced the Autoregressive Distributed Lag (ARDL) cointegration technique to overcome the limitations of the two general cointegration techniques. The ARDL method is applicable to variables having different orders of integration, precisely $I(0)$ and $I(1)$.

For panel ARDL, the researcher can choose from three models; Mean Group (MG), Pooled Mean Group (PMG) and Dynamic Fixed Effect (DFE) based on the properties of the data. Pesaran et al.

(2001) suggest the use of Mean Group (MG) technique to resolve the bias from heterogeneous slopes associated with dynamic panels. The MG method provides long-run parameters for the panel by estimating an average of the long-run parameters from ARDL technique for individual firms. Our Hausman tests (reported in Table 4 of section four of this study) confirm that the PMG has consistent and efficient performance over the MG and the DFE estimates. Again, the PMG is employed in this study because it permits short-run coefficients, which includes the intercepts, the speed of adjustment to the long-run equilibrium values, and error variances to be heterogeneous entity by entity while the long-run slope coefficients are restricted to be homogeneous across entities. The panel ARDL (p,q) model specification is as follows:

$$Y_{it} = \sum_{j=1}^{p-1} \gamma_y^j Y_{i,t-j} + \sum_{j=0}^{q-1} \delta_y^j X_{i,t-j} + \phi^j y_{i,t-1} + \mu_i + \varepsilon_{it} \quad (2)$$

where $X_{i,t-j}$ is the vector ($k \times 1$) of the explanatory variables for group i and μ_i denotes the entity fixed effect. In principle, p and q may differ across entities. The ARDL model can be reparametrized as a vector error correction model (VECM) specified as follows:

$$\Delta Y_{it} = \theta_i (y_{i,t-1} - \beta_i X_{i,t-1}) + \sum_{j=1}^{p-1} \gamma_y^j \Delta Y_{i,t-j} + \sum_{j=0}^{q-1} \delta_y^j \Delta X_{i,t-j} + \mu_i + \varepsilon_{it} \quad (3)$$

where β_i represents the long-run parameters and θ_i denotes the group-specific speed of adjustment coefficient or the (error) correction parameters or the equilibrium and it is expected that $\theta_i < 0$. Here, the PMG restriction is that the members of β are common across entities. By substituting the financial performance of mutual funds proxied by return on investment (ROI), the model can be rewritten as:

$$\Delta ROI_{it} = \theta_i (y_{i,t-1} - \beta_i X_{i,t-1}) + \sum_{j=1}^{p-1} \gamma_y^j \Delta ROI_{i,t-j} + \sum_{j=0}^{q-1} \delta_y^j \Delta X_{i,t-j} + \mu_i + \varepsilon_{it} \quad (4)$$

Where, ROI is the measure of mutual fund financial performance, X is a set of explanatory variables, exchange rate, inflation, T-Bill, GDP growth rate and monetary policy, and firm size. Also, δ and γ denote the short-run coefficients of independent and dependent variables respectively, β represents the long-run coefficients, θ denotes the coefficient of speed of adjustment to equilibrium, while i and t signify the entity (in this case, the mutual fund) and time, respectively.

4. Data analysis and discussion of results

This section contains the descriptive analysis of the study variables, the multicollinearity test, the panel unit root test, and the Panel ARDL results from the PMG, MG and the DFE.

4.1. Descriptive statistics

The descriptive statistics of the variables used in this study are presented as follows.

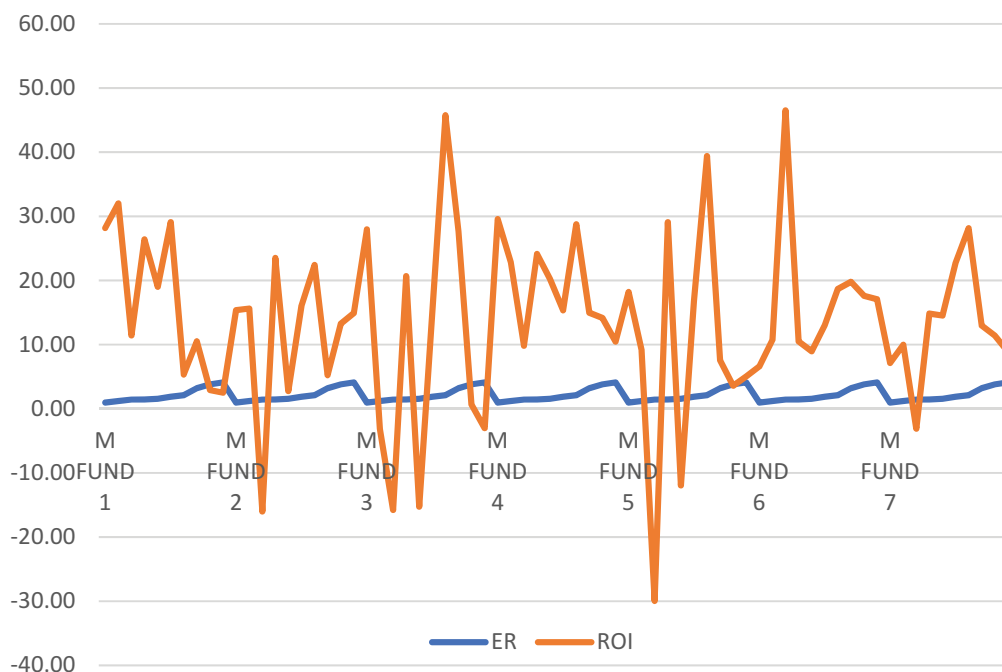
The summary statistics in Table 1 depicts that the average value of return of investment (ROI) for the selected mutual funds for the study period is 13.64%, the average exchange rate of the Ghanaian Cedi to the USD is 2.16, the average inflation rate is 8.28%, the average 91-Day T-Bill rate is 18.81%, the average GDP growth rate is 6.84% while the average monetary policy rate is 17.80%. A closer look at the medians from the summary statistics of the study variables indicate that the medians are not too far from the means, which imply that the data is not affected by outliers. The standard deviations of the study variables also indicate that the data for the variables do not vary

Table 1. Summary statistics of the study variables

	ROI	ER	INF	T-BILL	GDP	MPR	SIZE
Mean	13.647	2.166	8.287	18.814	6.844	17.800	15.648
Median	14.679	1.7123	7.600	20.650	6.079	16.500	15.125
Maximum	46.504	4.097	16.700	25.790	14.047	26.000	19.419
Minimum	-29.958	0.968	3.900	10.600	3.722	12.500	12.065
Std. Dev.	13.654	1.073	3.835	5.635	3.212	4.655	1.991
Skewness	-0.422	0.742	0.797	-0.368	0.917	0.714	0.166
Kurtosis	4.173	1.999	2.876	1.551	2.953	2.123	1.878
Jarque-Bera	6.095	9.344	7.453	7.698	9.815	8.184	3.994
Probability	0.047	0.009	0.024	0.021	0.007	0.017	0.136
Observations	280.000	280.000	280.000	280.000	280.000	280.000	280.000

too far from their means and the data values vary fairly. Specifically, the standard deviations for ROI, ER and GDP show that the variabilities of the data values around their means is very low. The p-values of the Jaque-Bera test for all the variables show a residual value less than 5%. A normal distribution has a p-value of the Jaque-Bera to be tiny or about 0.05 or less and from the descriptive statistics, the residuals of the variables in the study are normally distributed.

Figure 1. Annual trends of Exchange rate and mutual funds.



4.2. Annual trend analysis of selected macroeconomic variables and fund performance

This section displays a yearly trend analysis of selected covariates – exchange rate, inflation rate, monetary policy rate and mutual funds' performance in Ghana. The annual trends are depicted in Figures 1-3. This is to show an overview of how these variables have behaved during the period of the study.

Figure 2. Annual trends of inflation rate and mutual funds.

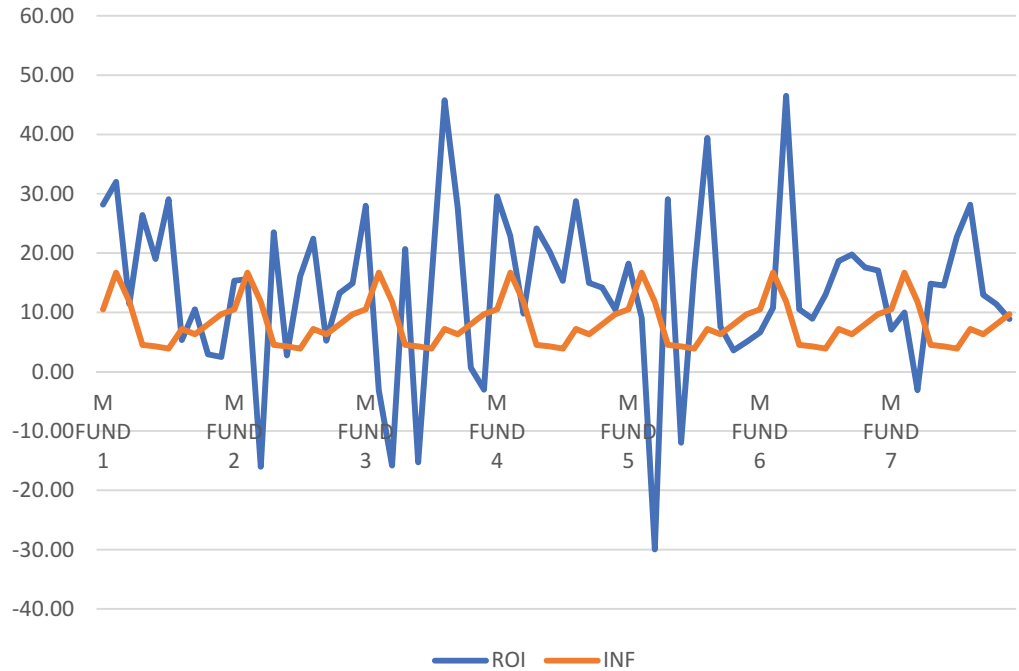


Figure 3. Annual trends of Monetary policy rate and mutual funds.

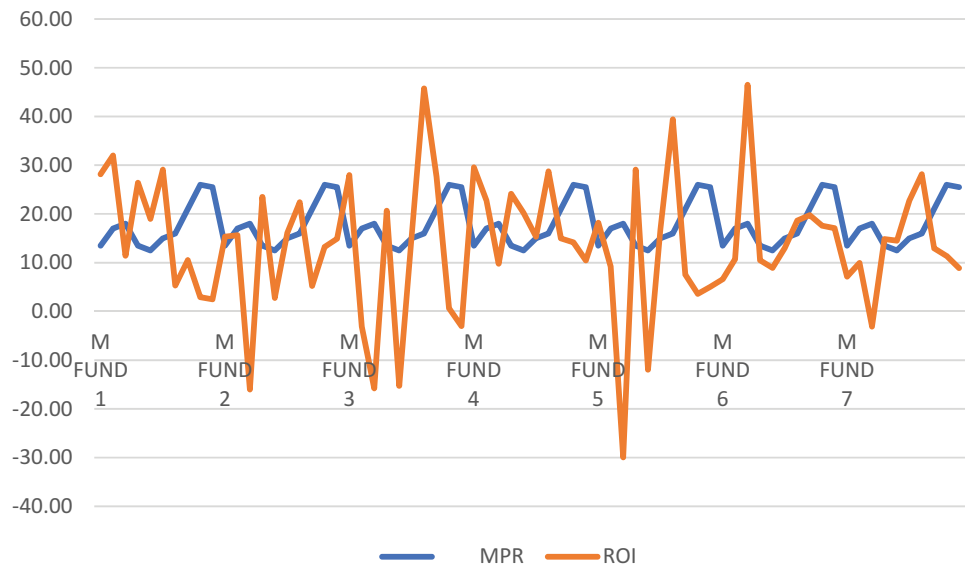


Table 2. Multicollinearity test

Variables	VIF	ER	INF	T-Bill	GDP	MPR	SIZE
ER	6.37	1.000					
INF	4.68	−0.164**	1.000				
T-Bill	1.66	0.341***	0.310***	1.000			
GDP	2.18	−0.517***	−0.290**	−0.311***	1.000		
MPR	8.88	0.506***	0.218**	0.516***	−0.677***	1.000	
SIZE	1.13	0.315***	−0.110	0.109	−0.099	0.251**	1.000

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Figure 1 shows the annaul trends of exchange rate and mutual funds performance. In 2008 the exchange rate rose by Ghc0.23. It further increased by Ghc0.23 in 2009, this thus means it increased by the same rate in 2008 and 2009. The cedi performed well by appreciating in value and hence increasing at a decreasing rate in 2010 at a rate of Ghc0.02 recording the lowest change. Thereafter, the cedi depreciated in 2011 by recording a difference of Ghc 0.1. In 2012, there was a further increase of Ghc0.33. There was a moderate increment from 2012 to 2013 by recording a rate of Ghc 0.22. Subsequently, the cedi fell drastically between 2013 and 2014 recording the highest increment of Ghc 1.1. There was a further increment in 2015 and 2016 at a rate of Ghc 0.59 and Ghc 0.31, respectively.

Regarding inflation, which is illustrated agaist ROI in Figure 2, the country experienced an inflation rate of 10.50% in 2007. In 2008, there was a global inflationary rise which replicated itself in Ghana causing the country to record its highest rate of inflation of 16.70 % in that year. The rise is attributed to the general rise in the prices of foods which caused a shortage in most parts of the world and the fluctuation in crude oil price. The non-food groups, hotels, operations and services also contributed significantly to the change. There was a decrease in 2009 at a rate of 11.80% and further experienced steep downward trend in 2010, 2011 and 2012 at a rate of 4.50%, 4.27%, and 3.90%, respectively. In 2013, it rose from 3.90% to 7.20% and further experienced slight drop of 6.30% in 2014. There was a steady rise of 8.00% and 9.70% in 2015 and 2016, respectively.

Figure 3 shows the annaul trends of monetary policy rate and mutual funds performance. Ghana experienced a lot of fluctuations in its monetary policy rate. As indicated from the diagram, there was a sharp rise from 13.50% in 2007 to 17% in 2008. There was a steady increase of 1% in 2009. It further decreased to 13.50% and further to 12.50 in 2010 and 2011, respectively. It rose to 15% in 2012 and went up by 1% by recording 16% in 2013. There was an upward trend in 2014 by recording a rate of 21%. 2015 experienced the highest percentage of 26% and a slight decrease of 0.5% fallen to 25.5% in 2016.

4.3. Multi-collinearity

We employ Pearson correlation to test whether the variables in our study, particularly the independent variables are highly correlated themselves or not. Generally, if coefficients value rises more than 0.8, it indicates a multi-collinearity problem (Kennedy, 2008).

Table 2 demonstrates the outcome of the Pearson correlation. From the table, the coefficient values of all the variables are less than 0.8 which indicates that we should not be too wary over the issue of multi-collinearity issue therefore we can pursue our analysis. It could also be observed

Table 3. Unit root test

Variable	Levin, Lin & Chu test			Im, Pesaran & Shin test				Decision
	Level	First difference		level		First difference		
		T-stats	P-value	T-stats	P-value	T-stats	P-value	
ROI	-3.19	0.02	-10.57	0.00	-1.33	0.09	-4.45	I (1)
ER	4.47	1.00	-1.99	0.00	3.83	0.99	0.45	I (1)
INF	-11.78	0.00	-	-	-5.27	0.00	-	I (0)
T-bill	-4.73	0.00	-	-	-1.80	0.04	-	I (0)
GDP	-0.19	0.42	-3.22	0.00	0.68	0.75	-0.77	I (1)
MPR	1.75	0.96	-4.69	0.00	0.94	0.83	-0.95	I (1)
SIZE	-1.72	0.04	-5.50	0.00	1.62	0.94	-1.83	I(1)

Table 4. Panel ARDL Estimation for macro determinants of performance of mutual fund

Variables	Pooled Mean Group		Mean Group		Dynamic Fixed Effect	
	Short-Run	Long-Run	Short-Run	Long-Run	Short-Run	Long-Run
Error Correction	−1.434*** (0.187)		−2.176*** (0.264)		−1.181*** (0.152)	
Δ Exchange rate (ER)	−7.861 (13.266)		−39.267 (24.989)		25.476 (32.364)	
Δ Inflation (INF)	−0.876 (0.844)		−4.324** (1.844)		2.284 (2.900)	
Δ T-bill	−0.745*** (0.234)		−0.708*** (0.272)		−0.335 (0.824)	
Δ GDP	0.035 (0.426)		−0.105 (0.420)		−0.337 (0.712)	
Δ Policy rate (MPR)	3.371*** (1.099)		11.622*** (3.352)		−3.142 (5.589)	
Fund size (SIZE)	3.158*** (0.682)		6.134 (2.876)		4.328 (3.530)	
Hausman Test ¹				3.17 (0.366)		
Hausman Test ²						0.12 (0.940)
Exchange rate (ER)		78.612*** (4.332)		144.874*** (42.405)		−32.944 (104.409)
Inflation (INF)		9.510*** (0.582)		19.302*** (5.756)		−5.662 (13.749)
T-bill		3.328*** (0.579)		3.618** (1.559)		2.047 (6.223)
GDP		2.911*** (0.589)		6.853* (3.396)		4.377 (6.793)
Policy rate (MPR)		−28.597*** (1.496)		−53.615*** (13.713)		7.740 (35.775)
Fund size (SIZE)		37.476 *** (0.318)		43.1309*** (13.040)		30.624*** (4.173)
Constant	46.876*** (8.461)		−34.309 (61.818)		−222.399 (78.271)	

*, **, and *** indicate significance at 1%, 5%, and 10%, respectively. Standard errors are reported in parentheses. Hausman Test¹: PMG is efficient estimation than MG under null Hypothesis. Hausman Test²: PMG is efficient estimation than DFE under null Hypothesis. The Hausman tests indicate that PMG is consistent and efficient estimation than MG and DFE estimation. However, the mean group (MG), and the dynamic fixed effects DFE are shown together with the Pooled mean group (PMG) in the table for comparison purpose. The lag structure is ARDL (1, 1, 1, 1, 1, 1, 1) representing return on investment (the dependent variable), exchange rate, inflation, T-bill, GDP, monetary policy rate, fund size.

that the monetary policy indicator, MPR has relatively higher correlation with the other variables and this may be because policymakers always target variables such as interest rate, and exchange rate, which is considered as powerful instruments of monetary policy with antecedent impact on inflation, economic growth, and other economic variables.

4.4. Unit root

Table 3 shows the result of the stationarity test for the variables in the panel, the result of series of stationarity. The study used two diverse unit tests to check the stationarity of the variables in order to ascertain if the variables are stationary or not and to also determine the most suitable empirical

model. It is very imperative to conduct this test to avoid the situation of having spurious regression leading to inconsistencies in the resulting estimates (Bhattarai and Armah, 2005).

From the results in Table 3 of the Panel Unit root test, it is evident that with the exception of Inflation rate and T-bill rate which are stable at their contemporary levels, all the other variables had unit root and those variables became stationary first difference. Thus, ROI, ER, GDP SIZE, and MPR are all integrated of order one $I(1)$ while INF and T-BILL are integrated of order zero $I(0)$ processes. The outcome of the unit root test justified the use of the Panel Autoregressive Distribute Lag (ARDL). According to Pesaran et al. (2001), the ARDL model is suitable when the study variables are integrated of orders $I(1)$ and $I(0)$.

4.5. Panel ARDL results for macroeconomic determinants of mutual fund performance

Table 4 reports the estimation results of the mean group (MG), the Pooled Mean Group (PMG) and the Dynamic Fixed Effect (DFE) models. The results of these models depict the short-run and long-run dynamics of the selected macro-economic variables on the financial performance of mutual funds. The outcome of the PMG estimates is preferred since the Hausman tests (also reported in Table 4) confirm its consistent and efficient performance over the MG and the DFE models, however, we provide the results of the MG and the DFE for comparative purposes.

The outcome of the PMG Panel ARDL estimations exhibited in Table 4 shows that in the short-run, T-bill and Policy rate, respectively, have strong negative and positive impacts on the financial performance of mutual funds. Considering the fact that this study investigates the contributory effects of each variable to the financial performance of mutual funds, our results show that it is only T-Bill and Monetary policy that have short-run impact on mutual funds' performance while Exchange rate, Inflation and GDP growth rate have an insignificant influence in fostering the mutual funds' performance in the short-run. This means that T-Bill and Monetary Policy rate have short-run contributory impacts in fostering economic growth.

The long-run results of the PMG on the other hand brings to the fore a better outcome as compared to the short-run results. In the long-run, exchange rate, inflation and GDP growth showed a strong positive impact on mutual fund performance and surprisingly, T-Bill and policy rate have strong positive and negative impact respectively on the financial performance of mutual funds. The long-run results signify that all the macroeconomic variables in our model have long-run contributory impacts on mutual funds' financial performance. The validity of the results in our model is supported by the error correction coefficient which is significant and negative for all the three short-run models.

The significant long-run positive relationship between return on investment of mutual funds and exchange rate is observed, perhaps, because most of the mutual funds in Ghana invest in financial securities that are denominated in a currency which is appreciating in value since this can spiral returns on investment and hence, increase net asset value. Also, at a period of higher exchange rate, there is a possibility of high demand for goods produced locally. This is due to the fact that the strong foreign currency dampens the demand for foreign products as converting the local currency to foreign currency causes their prices to be very high. Domestic firms can increase their earnings, and since most of the mutual fund companies acquire shares from these companies, they can increase their returns. This means exchange rate can substantially impact mutual funds in Ghana even if they only hold domestic investment. This is in line with Adam and Tweneboah (2008) findings who concluded that there is a significant positive impact of exchange rate on financial performance.

The outcome of our model also shows that inflation rate is positively and significantly related to return on investment in the long-run. The reason might be that the stock market in Ghana has

historically performed well since listed companies have often benefited from the earnings rising along with inflation. Since most mutual fund managers invest in listed companies, their returns are likely to increase or decrease depending on how these companies perform. Some mutual funds diversify their portfolio by holding a mix of equity and bonds. However, though coupon rates are generally higher than interest rates, there may be a situation where interest rate may lag behind inflation rate. Kariuki (2014) and Marfo (2016) confirmed that inflation has a positive relationship with mutual fund performance.

The results indicate that Monetary Policy has a significant negative impact on return on investment; therefore, an increase in monetary policy will likely decrease mutual fund performance. This is in line with the study conducted by Ndubuaku et al. (2017) who established that monetary policy has a significant negative relationship with banking performance in Nigeria. The result is also consistent with the study done by Adam et al. (2014) who brought to the fore that monetary policy negatively affects Banking financial performance in Pakistan.

The observed relationship between GDP and ROI maybe because of the high demand for borrowed funds for expansion of businesses as the economy (GDP) expands, which drives interest rates up and consequently, most debt mutual funds gain in returns. Equity mutual funds' returns also gain with an economic expansion because listed firms grow and expand, and this both affects profitability as well as stock prices positively. This is consistent with the findings in Singh et al. (2011), Kariuki (2014), and Ongeru (2014).

The short-run effect of the T-Bill is consistent with the findings in Marfo (2016) and Mwangi, (2013) but opposed to the outcomes in Ongeru (2014) and Kariuki (2014). The long-run effect of the T-Bill is, however, in harmony with Kariuki (2014) and Ongeru (2014) but opposed to Mwangi (2013) and Marfo (2016). Theoretically, the T-Bill rate and Monetary Policy Rate have a positive relationship as the two serve as signaling or leading indicators from an economic policy perspective. Conventionally, the T-Bill is higher than or equal to the monetary policy rate at a given point in time as the monetary policy rate sets a base for costing funds from a policy perspective while the T-Bill is the government's offer rate to borrow funds from the public. However, in Ghana for the period under study, this trend has been mixed as the T-Bill has not been consistently higher than the MPR. This is more evident in the years 2011, 2012, 2015, 2016, 2017 and 2018 (data from BOG website, <https://www.bog.gov.gh/monetary-policy/policy-rate-trends/>). This mixed and inconsistent trend between the T-Bill and MPR might account for the observed mixed relationship of T-Bill and MPR with the ROI in both short and long-run periods.

5. CONCLUSION

The study examined the impact of macroeconomic variables on the financial performance of mutual funds in Ghana. The study documents homogenous long-run significant positive impacts of exchange rate, inflation, T-Bill, GDP growth on the financial performance of mutual funds, and a homogeneous long-run negative significant impact of monetary policy rate on mutual funds' financial performance. The study also establishes heterogeneous short-run respective significant negative and positive impacts of T-Bill and monetary policy rate on mutual fund's financial performance. Thus, it is recommended that the central bank of Ghana try to create a conducive environment by bringing its monetary policy rate to the barest minimum to ameliorate mutual funds' performance in Ghana in the long-run. This is because reduction in monetary policy rate will reduce cost of borrowing since the banks will offer loans at a lower rate which will create an enabling environment to do business. A lower monetary policy rate will bring down interest rate, and inflation and the ripple effect is that local businesses and consumers will spend more money on goods and services. This means that institutions will be making profit and will enable most of these institutions and individuals have more money to invest in mutual funds. It is evident from the present study that the monetary policy rate is

more than a tool meant to only regulate the level of economic activity (expansionary or contractionary monetary policy) or control inflationary pressures. Moreover, MPR is seen here to be a tool which can affect the performance of financial markets on the basis of the observed relationship between MPR and ROI of mutual funds in the present study. It is therefore recommended that central banks, especially the Bank of Ghana, pay close attention to the use of the monetary policy rate as a policy instrument not only to control inflation, growth and aggregate demand but also to redirect and influence financial markets. This study is limited to a few macroeconomic variables and seven mutual funds in Ghana; therefore, the study can be extended to cover other macroeconomic variables and other mutual funds in the country. The study may also be extended to cover other countries to fully explore the panel dynamics in the macroeconomic variables because this study is limited to Ghana due to data issues.

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References

- Abidin, S. Z., Ariff, M., Nassir, A. M., & Mohammed, S. (2004). International portfolio diversification: A Malaysian perspective. *Investment Management and Financial Innovation*, 1(3), 51–68.
- Adam, A. & Tweneboah, G. (2008). Macroeconomic factors and stock market movement: evidence from Ghana. *SSRN Electronic Journal*. <https://doi.org/10.2139/ssrn.1289842>
- Adjasi, C. K., Biekpe, N. B., & Osei, K. A. (2011). Stock prices and Exchange rate dynamics in selected African countries. A bivariate analysis. *African Journal of Economics and Management Studies*, 2(2), 143–164. <https://doi.org/10.1108/20400701111165623>
- Asaolou, T. O., & Ogunmuyiwa, M. S. (2011). An economic analysis of the impact of macroeconomic variables on stock market movement in Nigeria. *Asian Journal of Business Management*, 3(1), 72–78.
- Banegas, A., Montes-Rojas, G., & Siga, L. (2016). *Mutual fund flows, monetary policy and financial stability*. Finance and Economics Discussion Series 2016-071, Board of Governors of the Federal Reserve System (U.S).
- Belgacem, B. S., & Hellara, S. (2011). Predicting Tunisian mutual fund performance using dynamic panel data model. *The Journal of Risk Finance*, 12(3), 208–225. <https://doi.org/10.1108/15265941111136950>.
- Bhattarai, K. R., & Armah, M. K. (2005). *The effects of exchange rate on the trade balance in Ghana: evidence from cointegration analysis*. Hull, Centre for Economic Policy. University of Hull.
- Bodie, J., Kane, A., & Marcus, A. (2009). *Investments*. McGraw-Hill Higher Education. Ninth Ed. ISBN-13: 978-0071263252
- Brennan, J. M. (1971). *Capital asset pricing and the structure of security returns*. [Unpublished manuscript]. University of British Columbia.
- Chowdhury, M. A. F., & Rasid, M. E. S. M. (2017). Determinants of performance of Islamic banks in GCC countries: Dynamic GMM approach. *Advances in Islamic Finance, Marketing, and Management*, Emerald Group Publishing Limited, Bingley, 49–80. <https://doi.org/10.1108/978-1-78635-899-820161005>
- Coffie, M. S. (2019). *An empirical analysis of the impact of macroeconomic factors on open-end mutual fund prices in Ghana*. Ashesi University. <http://hdl.handle.net/20.500.11988/501>
- Engle, R. F., & Granger, C. W. (1987). Co-integration and error correction: Representation, estimation, and testing. *Econometrica*, 55(2), 251–276. <https://doi.org/10.2307/1913236>
- Fernando, D., Klapper, L. F., Sulla, V., & Vittas, D. (2003). *The global growth of mutual funds*. Policy Research Working Paper Series, 3055, The World Bank.
- Garg, M., & Srivastava, S. (2019). Correlation Among the Macroeconomic Variables and Mutual Funds in India: A Descriptive Study. *International Journal of Management and Social Sciences*, 8(2.4).
- Gentry, J. R. & Shen, W. (2010). The relationship between accounting and market measures of firm financial performance: How strong is it? *Journal of Managerial Issues*, 22(4), 514–530.
- Gupta, S. K., & Sinha, A. D. K. (2016). Impact of Economic events on performance of mutual funds: Evidence from India. *ELK Asia Pacific Journals*. Special Issue. <https://ssrn.com/abstract=3285682>, ISBN 978-93-855370-1-1.
- Gusni, S., & Hamdani, F. (2018). Factors affecting equity mutual fund performance: evidence from Indonesia. *Investment Management and Financial Innovations*, 15(1), 1. [https://doi.org/10.21511/imfi.15\(1\).2018.01](https://doi.org/10.21511/imfi.15(1).2018.01)
- Hojat, S. (2015). *The impact of monetary policy on the stock market*. [Dissertation to the Walden University]. Walden University.
- Im, K. S., Pesaran, M. H., & Shin, Y. (2003). Testing for unit roots in heterogeneous panels. *Journal of Econometrics*, 115(1), 53–74. [https://doi.org/10.1016/S0304-4076\(03\)00092-7](https://doi.org/10.1016/S0304-4076(03)00092-7)
- Johansen, S., & Juselius, K. (1990). Maximum likelihood estimation and inference on cointegration—with

- applications to the demand for money. *Oxford Bulletin of Economics and Statistics*, 52(2), 169–210. <https://doi.org/10.1111/j.1468-0084.1990.mp52002003.x>
- Kariuki, E. C. (2014). Effect of Macro economic variables on financial performance of mutual funds industry in Kenya. [Unpublished Research Project]. University of Nairobi
- Keats, B.W. & Hitts M. A. (1988). A causal model of linkages among environmental dimensions, macro organizational characteristics and performance. *Academy of Management Journal*, 31(3), 570–598.
- Kennedy, P. (2008). *A guide to econometrics*. 6th Edition, Blackwell publishing, Malden.
- Kotishwar, A. (2017). Selected economic variables impact on mutual fund subscription and redemption – a study. *International Journal of Applied Business and Economic Research*, 15(1), 23.
- Kyereboah-Coleman, A., & Agyire-Tetteh, K. F. (2008). Impact of macroeconomic indicators on stock market performance: The case of Ghana stock exchange. *The Journal of Risk Finance*, 9(4), 365–378.
- Levin, A., Lin, C. F., & Chu, C.-S. J. (2002). Unit root tests in panel data: Asymptotic and finite sample properties. *Journal of Econometrics*, 108(1), 1–22. [https://doi.org/10.1016/S0304-4076\(01\)00098-7](https://doi.org/10.1016/S0304-4076(01)00098-7)
- Lobao, J., & Levi, A. (2016). The relation between mutual fund flows, stock returns and macroeconomic variables: Evidence from Portugal. *Portuguese Journal of Finance, Management and Accounting*, 2(4): 2183–3826. <http://u3isjournal.isvouga.pt/index.php/PJFMA/article/view/172>.
- Marfo, K. N. (2016). *The effect of Exchange rate, Interest rate and Inflation on the performance of mutual funds in Ghana*. [Masters Dissertation]. Kwame Nkrumah University of Science and Technology
- Markowitz, H. M. (1952). Portfolio Selection. *The Journal of Finance*, 7(1), 77–91. <https://doi.org/10.2307/2975974>
- McWhinney, J. E. (2018). *A brief history of the mutual fund*. Investopedia. <http://www.investopedia.com/articles/mutualfund/05/mfhistory.asp>
- Mwangi, G. (2013). Effect of Macroeconomic variables on financial performance of insurance companies in Kenya. [Unpublished Project Report]. Chandaria School of Business
- Ndubaku, V. C., Ifeanyi, O., Nze, C., & Onyemere, S. (2017). Impact of monetary policy (Interest Rate) Regimes on the performance of the Banking Sector in Nigeria. *Journal of Economics and Finance*, 8(4), 22–29. <https://doi.org/10.9790/5933-0804011632>
- Olweny, T., & Omondi, K. (2011). The effect of Macro-economic factors on stock return volatility in the Nairobi Stock Exchange, Kenya. *Economic and Finance Review*, 1(10), 34–48.
- Ongeri, G. M. (2014). The effect of macroeconomic variables on the financial performance of Non- Bank Financial institutions in Kenya. [Unpublished Research Project]. University of Nairobi
- Pal, K., & Mittal, R. (2011). Impact of macroeconomic indicators on Indian Capital Markets. *The Journal of Risk Finance*, 12(2), 84–97. <https://doi.org/10.1080/15265941111112811>
- Panigrahi, A., Karwa P., & Joshi, P. (2020). Impact of macro-economic variables on the performance of mutual funds: a selective study. *Journal of Economic Policy and Research*, (115).
- Pattitoni, P., Petracci, B., & Spisni, M. (2014). Determinants of profitability in the EU-15 area. *Applied Financial Economics*, 24(11), 763–775. <https://doi.org/10.1080/09603107.2014.904488>
- Pesaran, M. H., Shin, Y., & Smith, J. R. (2001). Bounds testing approaches to the analysis of level relationships. *Journal of Applied Econometrics*, 16 (2001), 289–326. <https://doi.org/10.1002/jae.616>
- Qureshi, F., Khan, H. H., Ur Rehman, I., Qureshi, S., & Ghafoor, A. (2019). The effect of monetary and fiscal policy on bond mutual funds and stock market: An international comparison. *Emerging Markets Finance and Trade*, 55(13), 3112–3130. <https://doi.org/10.1080/1540496X.2018.1535432>
- Ramey, G., & Ramey, V. (1995). Cross country evidence on the link between volatility and growth. *American Economic Review*, 85(5), 1138–1151.
- Rasiah, D., & Kim, P. (2011). The effectiveness of Arbitrage pricing model in modern financial theory. *Journal of Economics Research*, 2(3), 125–135.
- Richard, P., Devinney, T., Yip, G., & Johnson, G. (2009). Measuring Organizational Performance: Towards Methodological Best Practice. *Journal of Management*, 35. <http://doi/10.1177/0149206308330560>.
- Sharpe, W. (1966). Mutual fund performance. *The Journal of Business*, 39(5), 119–138. <https://doi.org/10.1086/294846>
- Singh, T., Mehta, S., & Varsha, M. S. (2011). Macroeconomic factors and stock returns: Evidence from Taiwan. *Journal of Economics and International Finance*, 2(4), 217–227.
- Tulamy, S. J. A. (2013). The effect of economic factors on the efficiency of mutual funds in Iran. *Technical Journal of Engineering and Applied Sciences*, 1707–1711.

Table A1: Features of the mutual funds in our sample

Fund	Features	Portfolio
Epack Investment Fund	Est. 1996 Open-ended Equity only 3-year vesting period	Equities in selected African countries
Anidaso Mutual Fund	Est. 2004 Open-ended Equity and fixed income 3-year vesting period	Investments in Ghana
Campus Mutual Fund	Est. 2007 Open-ended Equity and fixed income	Investments in Ghana
Databank Balanced Fund	Est. 2007 Open-ended Equity and fixed income	Investments in Ghana
Databank Money Market Fund	Est. 2004 Open-ended Fixed income only	Investments in Ghana
SAS Fortune Fund	Est. 2004 Open-ended Equity and fixed income 3-year vesting period	Investments in Ghana
EDC Balanced Fund	Est. 2008 Open-ended Equity and fixed income	Investments in Ghana



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